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HACKH'S
CHEMICAL DICTIONARY

Hackh's Chemical Dictionary

[AMERICAN AND BRITISH USAGE]

Containing the Words Generally Used in Chemistry, and Many of the Terms Used in the Related Sciences of Physics, Astrophysics, Mineralogy, Pharmacy, Agriculture, Biology, Medicine, Engineering, etc

BASED ON RECENT CHEMICAL LITERATURE WITH NUMEROUS TABLES, DIAGRAMS, PORTRAITS AND OTHER ILLUSTRATIONS

THIRD EDITION

COMPLETELY REVISED AND EDITED

BY

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PREFACE TO THE THIRD EDITION

It is my sad duty to record the sudden death of Ingo Hackh on 18th October, 1938, and to pay tribute to the bold imagination which conceived this Dictionary, and to the untiring energy which secured for it an established place in chemical literature on both sides of the Atlantic

Having collaborated closely with Hackh in the earlier editions it falls to my lot to continue the work in the way he would have desired The objects and scope of the Dictionary are stated clearly in the Prefaces to the earlier editions, and there has been no important departure from them except in one respect This is the omission of the pronunciations, which it has been felt, can be of little real use while every chemist remains a law unto himself on such matters This omission and certain other modifications have however, enabled substantial economies in space to be made without detriment in any way to the completeness of the Dictionary or the clarity of the definitions, so that although a considerable number of additions have been made, the book has not increased in bulk to anything like a proportional extent

In addition the whole Dictionary has been completely revised and brought up-to-date in every respect, special care being taken to balance the treatment from the American and British points of view The desirability for this has always been felt strongly in the past, but in a post-war world every line of approach to community of thought between the English-speaking nations has an added significance

The writer hopes that this third edition will maintain the present status of the Dictionary in chemical literature, which he believes to be unique by reason of the number of definitions it contains (now totalling over 57,000) and its many points of contact with other spheres of scientific activity He hopes, too, that future editions will benefit in the same way as this edition from readers' suggested additions, deletions and corrections

Finally, he feels that he owes a special acknowledgment to the publishers for their general collaboration, but in particular for their assistance in smoothing out the inevitable difficulties of communicating across the Atlantic in War time

JULIUS GRANT

LONDON, ENGLAND

PREFACE TO THE SECOND EDITION

The words of Berzelius a hundred years ago hold true today; namely that "the devil should write books on chemistry, for every few years the science changes"

During the seven years which have elapsed since the first edition of this work appeared, there have come revolutionary discoveries and many other changes in chemistry Nothing was known of heavy hydrogen and its series of deuterium compounds, nothing was known of artificial radioactivity with its radioelements The neutron, neutrino and positron were not yet discovered and little of the chemical nature of vitamins and hormones was revealed (today some of them are even synthesized in industrial quantities) There was little known of molecular structure or of nuclear reactions This edition contains information on these developments It also offers some new and original tables on porphin derivatives in which are shown the relationship of chlorophyll and hemoglobin pigments, on cholane derivatives, which brings together vitamins, bile acids, sex hormones, toad poisons and aglycones, also on carotenes, on quantum relations, on plastics and many other topics Thus this edition is a witness of the coming coordination and systematization of our knowledge, for it assembles apparently unrelated and widely different substances and concepts

The first edition witnessed the completion of the periodic system, the formulation of the quantum theory, the recognition of isotopes and the spectral classification of stars The second edition gives an indication of future developments in molecular structure with its concepts of atomic distances, ionic radii and space lattices, of catalysis and adsorption, and of nuclear structure and its interesting reactions All these will become of increasing importance not only for industrial purposes, but also for modern pharmacology, which is the basis of modern scientific medicine

A dictionary to be a good companion should be like a wife or bosom friend, *above reproach* I feel intensely the great responsibility inherent in my task and am aware of human limitations The book was started twenty years ago under circumstances arising through war-time conditions It has become a hobby now, also an "old man of the sea" The inaccuracies which crept into the first edition have been eliminated and the inconsistencies corrected by the truly helpful work of Mr C J Saunders But despite even the most diligent and constant efforts exerted ever since the first edition appeared, I am conscious that the ideal has not been reached It will be found that the book is not a mere compilation of revamped definitions or descriptions, but a compendious presentation of specialized knowledge

The dictionary writer must, above all, *record usage* of the terms he defines, regardless of his personal opinion as to appropriate derivation, spelling or definition Thus there may be some who will demur at the simplified spelling of *sulfur* (adopted by the American Chemical Society and the United States Pharmacopoeia XI) and other words—may even be ready to protest that such spelling vitiates the etymology Before protesting, such persons will do well to consider deeply what defence they can offer in regard to oeconomy, gangraene, aether, aeternal, paenalty and many other words which are not spelled with the diphthong in England or elsewhere

In respecting customary usage I have still retained phosphorus and oestrone, which are the favored spellings of today But the good work of simplification will continue, regardless of the Greco-Latinists who, enmantled in their academic environment, are becoming ghostly in the gloom of desuetude

I am extremely grateful for the general reception which the first edition was accorded, also for the many helpful and suggestive criticisms of the reviewers which have been followed in practically all cases Mr C J Saunders, of Barcombe Mills (Sussex, England) rendered great service by voluntarily checking all cross references and suggesting many new definitions Professor J F Snell of McDonald College (Montreal, Canada) frequently sent long lists of new compounds and definitions Dr Willis A Boughton (Harvard) suggested a number of terms, so did Dr J A Jacobson (West Virginia) Frequent correspondence with Dr Austin M Patterson and Dr E J Crane (both of the Nomenclature, Spelling and Pronunciation Committee of the American Chemical Society) has greatly helped in obtaining accepted and preferred nomenclature My collaborator, Dr Julius Grant (London) contributed several hundreds of words which reflect British usage

Valuable information also came from the following, to whom I offer my sincere thanks for their interest Jerome Alexander (New York), E F Barringer (General Electric Co), Hermann Becks (California), H L Bendel (Bakelite Corp), M S Biskind (Committee on Nomenclature, A M A), Charles W Boxton (Coll Phys Surgeons), W L Caldwell (Am Rubber Prod Co), E H Carus (La Salle), Leon W Cook (Bayonne), N C Cooper (Roessler Hasslacher Co), D S Davis (Mead Corp), W E Deming (U S Bureau of Chemistry and Soils), J G F Druce (London), E G Eberle (Baltimore), A A Elston (Editor Double-Bond), E E Enck (Foote Mineral Co), John Field II (Stanford), L F Fieser (Harvard), D K French (Dearborn Chemical Co), H Groll (Shell Development Co), J Heyrovsky (Prague), H E Howe (Ind Eng Chem), David Katz (Milwaukee), A B Lamb (Harvard), Paul Logue (St Louis), F H Loring (London), H J Lucas (California Tech), G Lutz (Cleveland), Chas G Maier (U S Bureau of Mines), P R Mallory (Carboloy Corp), J W McBain (Stanford), E V McCollum (Johns Hopkins), Jas B McNair (Field Museum, Chicago), E C Moffat (Am Cyanamid Co), A V H Mory (Bakelite Corp), Jos N Nielson (Bakelite Corp), Maximilian Nierenstein (Bristol, Eng), Arne Olander (California), Kurth Passoth (New York), Linus Pauling (California Tech), John Read (St Andrews, Edinburgh), P Rothemund (Kettering Foundation), Pierre van Rysselberghe (Stanford), John H Schmidt (Bakelite Corp), Kurt Schuette (San Francisco), E Schultz (Stanford), Wilhelm Segerblom (Exeter, Pennsylvania), G Frederick Smith (Illinois), Wm Steinschneider (Zinsser and Co), M L Tainter (Stanford), J S Vanick (International Nickel Corp), E A Vuilleumier (Dickinson), Frank B Wade (Indianapolis), Willis Wagener (Palo Alto), J M Watt (Univ Witwatersrand, South Africa), C E Weinland (John Mansville Corp), Clarence J West (Nat Research Council), E H Westling (San Francisco), Frank C Whitmore (Pennsylvania State Coll), E C Williams (Shell Development Co), and John K Young (Stanford)

For various drawings I am indebted to Paul Brown (*radiations*) E H Westling (*porphin ring*), Harold Rosenthal (*molecular diagrams* and *isotopes*), E C Pozzi (*periodic spiral*), G W Ekins (*cholane ring*), and to "Contact Point," in which these and other illustrations appeared for the first time I also thank Dr Otto Reinmuth and the "Journal of Chemical Education" for the use of several portraits Illustrations have also been received from Paul O Abbe, Inc , Bausch and Lomb,

Buffalo Foundry and Machine Co , Baker Chemical Co , Fisher Scientific Co , Kipp and Zonen, and, Scientific Materials Co To all these I tender my appreciation for their courtesy

Between the manuscript and the finished book there is many a slip despite the careful work of the craftsmen My thanks go to the compositors, the proof readers, and the make-up men for their intelligent work The reading of the galleys and pages was done faithfully by my wife and sister, while Mr C V Brownlow, the editor of P Blakiston's Son and Co , corrected many pronunciations, all of this is gratefully acknowledged In closing, I hope that it may still be said of this book "the more it is used, the more it is valued "

INGO W D HACKH

SAN FRANCISCO, CALIFORNIA

PREFACE TO THE FIRST EDITION

Progress in chemistry has been so rapid that even the most expert have been unable to keep pace with its development Consequently, a more and more intensified specialization has resulted, which reflects itself in the modern, growing, and fluctuating terminology New ideas require new words and both are multiplying rapidly as the entire province of physical science, which now reaches from the gigantic island universes down to the sub-atomic microcosmos, is being developed Hence the need for a dictionary which records the old and new phenomena in the terms of our new concepts of matter and energy

Crane and Patterson in their book "A Guide to the Literature of Chemistry," state that "*There has been, in modern times, no adequate general dictionary or word-book of chemistry a book which gives the meanings of the large and increasing number of technical words*" My work on this dictionary was begun many years before I read that passage and my aim has been not to make a mere compilation or collection of facts, but to re-state and re-define in simple modern terms the phenomena of science, and to connect these phenomena with each other

, Imperfections will creep into a pioneer work of this nature, a work in which typographical and other mistakes such as errors of fact, omissions, etc , are least tolerated, especially by those who cannot realize the drudgery (fitful though it be), and the weariness of a task long drawn out that overcome one despite the promptings of enthusiasm and the spur toward achievement I hope that my readers will let me know what additions, deletions and corrections should be made to render the volume a more helpful guide for the worker in science

A chemical dictionary should state clearly and precisely the theories, laws and rules, describe accurately the elements, compounds, minerals, drugs, vegetable and animal products, list concisely the important reactions, processes, and methods, mention briefly the chemical apparatus, equipment and instruments, and, finally, should note the names of the investigators who have built up the science As chemistry reaches into nearly every branch of human endeavor it should not forget to bring in the collateral vocabulary of physics, astrophysics, geology, mineralogy, botany, zoology, medicine and pharmacy and, also, the pertinent jargon of industry, mining, and commerce Competent chemists will know how near I have measured up to these postulates

INGO W D HACKH

EXPLANATORY NOTES

Capital initial letters for the words defined are used according to established custom Thus, "Acacia" the plant, "acacia" the gum, "Bunsen law," but "bunsen burner"

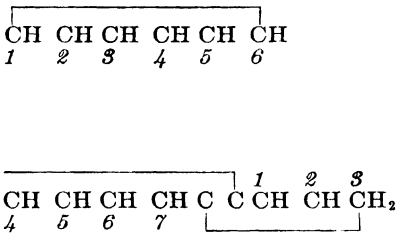
Capitals are always used in the definitions for the initial letter of the first word of a sentence

Nomenclature and spelling generally, follow the system adopted in the American Chemical Society publications, but British renderings are also included in all instances, and cross-references are given where necessary

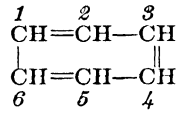
Nomenclature recommended by the International Union of Chemistry is asterisked thus (*), *e g*, "dipicolinic acid" is either, "1 5-" or "2 6-pyridinedicarboxylic acid*" However, absence of an asterisk does not indicate that the rendering given is unacceptable

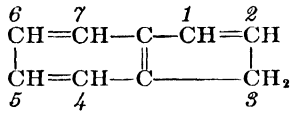
Ring systems are represented by one of the three following methods, and are numbered as shown

line-formula

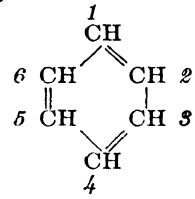


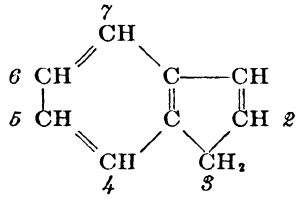
square-formula





geometric formula





Synonyms are given under each definition in order of approximate importance Most of them are also listed separately in the dictionary, with a cross-reference to the word under which the actual definition is to be found in the form of the word itself only Thus, "brassil Pyrite" means "for 'brassil,' 'see pyrite'" or "same as 'pyrite'"

Commercial names are referred to the scientific synonym, unless the compound is of special commercial importance *E g*, "soda ash" is defined under that heading

In the case of a few complex organic compounds having abbreviated or trade names for which a full definition is not justified or is unobtainable, the only definition given under the shorter name is the full chemical name Thus, "hydrargyrol Mercuric phenyl thionate"

Italics are not used for the words defined They are used in the definitions as follows (*a*) according to custom (thus "*Acacia*" the plant, but "acacia" the gum), (*b*) for cross-reference (*e g*, "acaricide A mite killer Cf *insecticide*"), (*c*) for the titles of publications, etc , (*d*) for some sub-headings of the definitions

Where a cross-reference consists of a double word, the portion of the word under which the definition is to be found is italicized if it is not the first portion This applies also to synonym cross-references *E g*, "seekay C K *wax*", and "chromone, 3-phenyl Iso*flavone*"

Compound words are usually defined under the heading of the first of the words, and should be sought under this heading in the first instance Thus "soda ash" is to be found under "soda," and not under "ash" Cross-references are however, usually given under the second word, and in some cases where importance and general custom demands the actual definition will be found under the latter, and a cross-reference under the former Thus, "high-speed ferrotungsten" is defined under "ferrotungsten" with a cross-reference under "high-speed"

Hyphens are used only when necessary to avoid errors Thus, "diphenylmethane" may mean either "diphenyl-methane, Ph_2CH_2", or "di-phenylmethane, $MeC_6H_4\ C_6H_4Me$"

Water of Crystallization is shown in the usual way, *e g*, $Na_2SO_4\ 10H_2O$ For didactic reason the method recommended by the Committee on Chemical Education, *e g*, $Na_2SO_4(H_2O)_{10}$, may be preferred

Ambiguous terms and spelling are avoided, thus "bromethane" may mean either "bromomethane" or "bromo-ethane"

Derivatives of organic compounds are to be found under the parent compound, thus, "p-nitrophenol" is under "phenol" The letters, o-, m-, p-, etc, have been ignored in the alphabetical arrangement, and are listed in the above order, thus, for "orthoanisidine" see "anisidine o-" Similarly α-, β-, γ-, etc are listed under the compound referred to, thus, for "α-naphthol" or "alphanaphthol", see "naphthol, α-"

The usual order of presenting or describing a compound is

Name Formula = Molecular weight Synonyms Occurrence, preparation or type of substance Appearance, (crystalline form, color), density, melting-point, boiling-point, and solubility in water, alcohol or ether Chemical, industrial, and medicinal uses

Abbreviations commonly used are

Å U, or Å for Ångstrom units

α for specific rotation *E g*, $[\alpha]_D^{20}$ is the value of α for the D-line at 20°C

Ac for acetyl, CH_3CO— *E g*, AcOH is acetic acid

Am for ammonium, NH_4— *E g*, AmCl is ammonium chloride (Sometimes Am for amyl, C_5H_{11}— i-Am for isoamyl)

at for atomic *E g*, at wt, at no

b for boiling-point in °C *E g*, b_{600mm} 60 means, boils at 60°C under a pressure of 600 mm of mercury

Bu for butyl, C_4H_9— i-Bu for isobutyl

Bz for benzoyl, PhCO *E g*, BzOH is benzoic acid

Cf for compare

cryst for crystalline or crystallizing

d for density at room temperature $d_0°$ for density at 0°C $d_{air=1}$ for density compared to air

decomp for decompose, -osing, -oses, or -osed *E g*, decomp 20, means decomposed at 20°C

Et for ethyl, C_2H_5— *E g*, EtOH is ethyl alcohol

m for melting-point in °C (used similarly to b, boiling-point)

M for any monovalent metal

Me for methyl, CH_3— *E g*, MeOH is methyl alcohol

mol for molecule *E g*, mol wt

n for refractive index *E g*, $[n]_D^{20}$ is the value for the D-line at 20°C

no for number *E g*, at no

Ph for phenyl, C_6H_5— *E g*, PhH is benzene

pl for plural

Pr for propyl, C_3H_7— i-Pr for isopropyl

q v for (1) which see (in cross-references),
(2) as much as desired (in prescriptions, etc)

R for any monovalent radical

sapon for saponification *E g*, sapon val

unsap for unsaponifiable *E g*, unsap matter

val for value *E g*, iodine val

vol for volume

X for any halogen or monovalent anion

Symbols are defined in the appropriate places (see especially the first entries under each letter) and under *constants*, *notation*, *nomenclature*, and *symbols*, they follow the commonly-accepted conventions

Where the word defined is continuously repeated in its main definition or sub-definitions, it is represented by its initial letter followed by a stop so long as the meaning is not thereby obscured

A CHEMICAL DICTIONARY

A

A (a) Symbol for *argon* (b) Abbreviation for (1) *ampère*, (2) *anode*, (3) *alternate*, (4) *year*, (5) *atomic weight* **A acid** 1 7-Dihydroxynaphthalene-3 6-disulfonic acid **A C** Alternating current **A U** Ångstrom unit Atom unit

°**A** The symbol for "*degree Absolute*"

Å See æ (German)

Å Abbreviation for *Ångström* unit

a Abbreviation for (1) *asymmetric*, (2) *ana*-position, (3) *area* **a-, an-** Prefix indicating "without" or "not," as in abiosis, anhydrous

a A constant in van der Waal's equation (q v)

[*a*] Symbol for specific rotation, $[a]_D$ measured with the D line, $[a]_D^t$ and at the temperature, *t*

A_n Abbreviation for normal atmosphere 760 mm Hg (d 13 59509), or 1 013249 × 10^6 dyne/cm²

α The first letter of the Greek alphabet, *alpha*, which is used as an abbreviation for (1) *alpha*-position (2) *alpha*-particles, (3) A mutation isomer of a sugar, as, α-glucose [α] See [*a*] α-**acid** 2 8-Naphthylamine sulfonic acid

abaca Manila hemp A native name for the inner fiber of *Musa textilis*, a banana species of the Philippine Islands

abasin A brand of acetylcarbromal

abati drying oven A constant temperature oven with a xylene bath for maintaining temperatures at 100–200°C

abaxial Not in the line of axis

Abbé, Ernst 1840–1905 A German physicist **A apertometer** A device for measuring microscope apertures **A camera lucida** An optical device for drawing microscopical objects attached to the eye-piece of a microscope **A condenser** An arrangement of lenses that increases the illumination of an object under the microscope **A refractometer** A device for rapid, direct determination of refractive index, extensively used in analytical chemistry **A theory** The limit of microscopic visibility is determined by $w = \lambda/2n \sin \mu$, where *w* is the width of the object, $n \sin \mu$ the aperture, and λ the wave-length of the light With an oil-immersion lens ($n \sin \mu = 1\ 4$) and extreme violet light ($\lambda = 0\ 4\mu$) the smallest visible thread has a width of $0\ 15\mu$

abbreviations See *atomic weight, electrical units, notation, quantum, radical*, etc

Abderhalden, Emil 1877– A Dutch-born German chemist, noted for physiological and pathological research **A dialysator** An apparatus used in sero-diagnosis for separating proteins by dialysis **A reaction** A test **A. test** A serum reaction used for diagnostic purposes, as in pregnancy Cf *complement fixation, ninhydrin, placentin*

Abegg, Richard 1869–1910 A German chemist noted for his theory of valence

Abel, Sir Frederick Augustus. 1827–1902 An English chemist noted for research on explosives and petroleum **A fuse** See *fuse* **A reagent** A 10 % solution of CrO_3 used for etching steel in microanalysis **A tester.** An apparatus for the determination of the flash point of petroleum and other oils

abelmoschus See *musk* seed

aberration Deviation from the normal **astronomical-** The apparent angular displacement of light from a star **chromatic-** The unequal refraction of white or multi-colored light The index of refraction is slightly different for each color, which cannot therefore be brought to a single focus by a simple lens, consequently a series of tinted images is produced **spherical-** The deviation of light passing through a lens, or reflected from a mirror, caused by the inequality in the degree of convergence, hence, the image appears distorted, especially at the outer portions See aplanatic *focus*

abienic acid Abienimic acid

abienimic acid $C_{18}H_{20}O_3$ = 208 2 Abienic acid An acid resin from *Abies pectinata* the European silver fir

Abies A genus of evergreen trees, the Coniferae (Pinaceae) or firs, which yield turpentine, resin and pitch, as

A balsamea	Silver fir
A (Tsuga) canadensis	Hemlock spruce
A excelsa	Norway spruce
A pectinata	European silver fir

abietene $C_{19}H_{30}$ = 258 3 Diterebentyl A liquid hydrocarbon, d 0 99, b 340–345, distilled from the resin of *Pinus sabiniana* Cf *colophene* **a sulfonic acid** A black paste produced by the slow action of sulfuric acid on a at 10°C , used as a wetting agent in the textile industry

abietic acid $C_{19}H_{29}COOH$ = 302 32 Sylvic acid An acid from the resin of pine species (colophony) Yellow crystalline leaflets, m 161, insoluble in water but soluble in alcohol or ether It is used in varnishes and dryers Cf *pimaric acid* **a anhydride** $C_{44}H_{56}O_4$ = 654 6 The anhydride (?) of abietic acid and the chief constituent of colophony

abietin (1) $C_{53}H_{76}O_8$ = 841 8 A crystalline resinous compound from the pitch of the European silver fir (2) Abietene (3) Coniferin

abietinic acid $C_{19}H_{28}O_2$ = 288 3 A crystalline acid derived from rosin, which occurs in 3 isomeric forms

abietinolic acid $C_{18}H_{24}O_2$ = 248 2 An acid resin from the pitch of the European silver fir, which occurs in 2 isomeric forms

abietite $C_4H_8O_6$ = 152 1 A tetrose sugar from the needles of the European silver fir

abiogenesis Autogenesis The spontaneous generation of life from inanimate or lifeless matter It is opposed to the generally accepted theory of biogenesis

abiophysiology The study based on the theory that life phenomena are purely dynamic and chemical processes

abiosis Absence of life

Abney clinometer A reflecting level or pocket altimeter for measuring the heights of trees, buildings, etc or fixing the slopes of drainage ditches, roads, etc

abnormal Irregular, or different from the normal

abradant Abrasive

Abraham consistometer A device for determining the hardness of bituminous materials or substances, from soft semi-liquids to hard brittle materials

abrasion Mechanical grinding or wearing away

abrasive Any grinding or polishing material, as burstone, corundum, emery, garnet, infusorial earth, pumice, carborundum, etc

abrastol $Ca(SO_3C_{10}H_6OH)_2,3H_2O$ = 540 3 Asaprol, calcium β-naphthol-α-monosulfonate A white or pinkish scaly powder, decomp 50, soluble in water or alcohol, darkens on exposure to light, has a bitter-sweet taste and is a germicide, preservative antipyretic, and antirheumatic

abraum salts (Ger abraumen—to put away) The potash salts of Stassfurt, carnallite, kainite, boracite, sylvine etc , which used to accumulate near the salt mines as valueless minerals before their great value as fertilizer material was recognized See *Stassfurt* salts

abrazite Gismondite

abriachanite An amorphous earthy form of blue asbestos

abric acid $C_{21}H_{24}NO_3$ = 334 3 An acid obtained from the abrus seeds or prayer beads, the seeds of *Abrus precatorius*

abrin Jequiritin A poisonous mixture of albumose and paraglobulin from abrus seeds which resembles snake venoms in its physiological action, an ophthalmic irritant

abrodil Sodium mono-iodomethane sulfonate A compound containing 52 % I used for intravenous injections (15–20 gm) to obtain x-ray pictures of the body

abrotanum Southern wood A garden plant whose leaves are used as an aromatic, formerly for medicinal purposes

abrotine $C_{21}H_{22}NO_2$ = 318 19 An alkaloid from Southern wood, *Artemisia abrotanum*, a Compositae

abrus root Indian licorice The roots of *A precatorius*, a Leguminosae of India, tropical Africa and Brazil, used as licorice substitute **a seeds** Jequirity, prayer or jumble beads, love peas, crab's eye Red seeds with black tips, of *A precatorius*, containing abrin and resin Used in ophthalmology, and in India as a weight (rati)

abscess An inflammation or collection of pus in the tissues of the body

abscissa The distance of any point measured perpendicularly to a horizontal scale (the ordinate), *x*-axis See *co-ordinates*

absinthe (1) Absinthium (2) A strong alcoholic beverage containing anise and wormwood oil **a oil** Wormwood oil

absinthic acid An acid of unknown composition, found in wormseed and supposed to be succinic acid

absinthiin $C_{15}H_{20}O_4$ = 264 15 A crystalline, poisonous principle, m 68, from absinthium

absinthin, absynthin $C_{40}H_{56}O_8,H_2O$ = 682 6 A glucoside from the dried leaves and flowering tops of *Artemisia absinthium*, wormwood A yellowish-brown amorphous powder, m 120–125, insoluble in water, soluble in alcohol or chloroform

absinthium Vermouth, wormseed, matterwood The dried leaves and flowering tops of *Artemisia absinthium*, a Compositae of the United States and Europe Used as a bitter tonic **oil of-** Wormwood oil

absinthol Thujol

absolute (1) An actual condition, independent, unrestrained and non-relative (2) Pure refined **a alcohol** Ethanol(100 %) **a boiling point** Critical temperature The temperature above which the liquid phase cannot exist, even under great pressure **a density** The density or specific gravity reduced to standard conditions In the case of gases, *e g* , 760 mm pressure and 0°C **a humidity** The water vapor content of the atmosphere in grams per cubic meter **a temperature** °A The degree of heat based upon the standard temperature scale which begins with absolute zero = −273°C Indicated by K (abbreviation for Kelvin) **a units** Ultimate rational units The three simplest and fundamental units of all measurements, viz , the centimeter, gram and second in the C G S system, or the foot, pound, and second in the F P S system **a zero** The temperature at which a substance is entirely devoid of heat, and at which all molecular movement ceases, hence, all gases and liquids are solidified Absolute zero 0°K (also *T*) or 0°A = −273 - 09°C = −459 4°F = −219°R

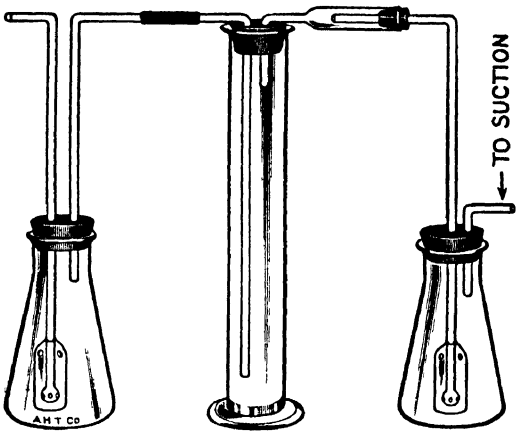
absorbent (1) Able to take up gases or liquids (2) Any agent which imbibes or attracts moisture, gases or wound secretions, and renders them inert or inactive, *e g* , absorbent cotton **gas-** A substance capable of absorbing gases, *e g* , for oxygen, potassium pyrogallate or phosphorus, for carbon monoxide, ammoniacal Cu_2Cl_2, for carbon dioxide, soda lime or KOH, **light-** Any transparent material solid, liquid or gaseous, which retains certain radiations when these fall on it **medicinal-** A purified fat-free cotton

absorbing power See *absorption* coefficient

absorptiometer (1) An apparatus devised by Bunsen for measuring the absorption of a gas by a liquid It consists essentially of a glass vessel containing the gas and the liquid, which is connected with a mercury reservoir thereby enabling variations of pressure to be obtained (2) A device for regulating the thickness of a liquid used in spectrophotometry

absorption The apparent disappearance of one or more substances or forces by being taken into another substance or transformed into another form of energy Generally absorption implies physical transformation Cf *adsorption* (1) *Chemical* Holding by cohesion or capillary action in the pores of a solid, *e g* , condensation of gases or imbibition of liquids by platinum sponge or charcoal, or gaseous molecules held between the molecules of a liquid (2) *Physical*

Retaining of characteristic waves (*e g*, heat or light radiations) by a solid, liquid or gas The



Absorption apparatus

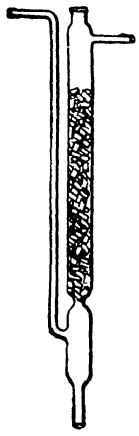
radiations may be transformed into either (*a*) kinetic energy or greater molecular vibrations, when the temperature of the absorbing substance rises, (*b*) excited atoms or molecules, when the substance becomes fluorescent (3) *Physiological* The transformation of non-living into living matter, *i e*, the change from food to protoplasm, *e g*, the imbibition of nutritive materials into the circulation Also the process of taking up waste products from tissues (4) *Therapeutic* The time interval between the administration of a drug and the first signs of the effect **heat of-** The number of calories evolved when a gas is absorbed by a liquid

Absorption cell

a apparatus An absorptiometer or other device for the absorption of gases or vapors, used in the laboratory or manufacturing plants (*e g*, Gay-Lussac tower) **a band** A group of light waves which are absorbed by molecules Cf *a spectrum* **a cell** A small glass cup with parallel walls which is filled with a colored solution and used, for the production of absorption spectra **a coefficient** (1) *Chemical* The amount, x, of a gas at standard temperature and pressure, which will saturate a quantity, q, of a liquid solvent According to the units selected, there are

Bunsen a c	x cc in 1 cc
Kuenen a c	x cc in 1 gm
Raoult a c	x gm in 100 cc

Ostwald a c Ratio of the concentration of a gas in the liquid to its concentration in the gas phase (2) *Light* The constant, k, in the equation $I = I_0 e^{-kcd}$, where I_0 and I are the intensities of the incident and transmitted lights, respectively, c the concentration and d, the thickness of the solution, and e the base of natural logarithms (3) *X-rays* The constant k in the formula $I = I_0 e^{-kd}$ **a law** See *Beer's law, Dalton's law* (3), *Henry's law* and *Draper's law* **a of food** See *metabolism* or *absorption* (3) **a of gases** See *absorption* (1) **a of light** See *absorption* (2) **a lines** The wavelengths of light absorbed by atoms Cf *a spectrum* **a paper** A fat-free filter paper used for the determination of fat in milk according to Adams' method, or for similar methods of fat or resin determination **a ray** A light ray transformed into heat by passing through matter **a spectrum** The visible or invisible (*e g*, ultraviolet) image produced by rays when passing in series through an absorbing medium and a spectroscope In the passage of light through gases, liquids or solids, some light waves may be converted into heat and thereby partially or totally retained in the interposing substance, *e g*, a green solution retains the red waves in white light, and therefore the passing light appears green In general, *molecules* absorb groups of wavelengths, giving *bands*, while *atoms* absorb single wavelengths, giving *lines* See also *spectrum* **a tube** Glass apparatus used in the laboratory for the absorption of gases by liquids or solids—*e g*, potash bulbs, etc **a value** Iodine value



Absorption tube

absorptive power The capacity to absorb expressed numerically

abstergent Detergent

abstract A summary of essential features

absynthin Absinthin

abundance of elements The estimated relative proportions of chemical elements in the earth

ABUNDANCE OF RARER ELEMENTS

		Lithosphere	Coal ash (max)
1	Zr	0 023	0 5
2	Ni	0 018	0 8
3	Zn	0 017	1 0
4	Sn	0 005	0 05
5	Co	0 004	0 15
6	Pb	0 0016	0 1
7	Mo	0 0015	0 05
8	Ga	0 0012	0 04
9	Y	0 001	0 08
10	Be	0 0007	0 1
11	Ge	0 0006	1 0
12	As	0 0005	0 8
13	Sc	0 0005	0 04
14	B	0 0003	0 3
15	Sb	?	0 1
16	Bi	0002	0 003
17	Ag	000006	0 001
18	Pt	000005	0 00007
19	Au	000005	0 00005
20	Pd	?	0 00002
21	Rh	?	0 000002

The tables show the percentage distribution in the solid (lithosphere), liquid (hydrosphere), and gaseous (atmosphere) portions of the earth, and the probable order of abundance, also that of the rarer elements in the lithosphere and coal ash (biosphere)

A C Abbreviation for alternating current

Ac (1) Symbol for actinium (2) Abbreviation for (1) acetyl, (2) acetate, (3) acyl radical

ac- A prefix which indicates substitution in an *alicyclic* nucleus Cf *ar-*

ABUNDANCE OF CHEMICAL ELEMENTS

Order	Lithosphere		Hydrosphere		Atmosphere		Meteorites			
							Iron		Stone	
1	O	47 33	O	85 79	N	75 53	Fe	72 06	O	35 43
2	Si	27 74	H	10 67	O	23 02	O	10 10	Fe	23 32
3	Al	7 85	Cl	2 07	Ar	1 40	Ni	6 50	Si	18 03
4	Fe	4 50	Na	1 14	H	0 02	Si	5 20	Mg	13 60
5	Ca	3 47	Mg	0 14	C	0 01	Mg	3 80	S	1 80
6	Na	2 46	Ca	0 05	Kr	0 01	S	0 49	Ca	1 72
7	K	2 46	S	0 05	Xe	0 005	Ca	0 46	Na	1 64
8	Mg	2 24	K	0 04	Remainder	0 005	Co	0 44	Al	1 53
9	Ti	0 46	N	0 02		—	Al	0 39	Ni	1 52
10	H	0 22	Br	0 01		—	Na	0 17	Cr	0 32
11	C	0 19	C	0 01		—	P	0 14	Mn	0 23
12	P	0 12	I	0 006		—	Cr	0 09	K	0 17
13	S	0 12	Fe	0 002		—	C	0 04	C	0 15
14	Mn	0 08	Remainder	0 002		—	K	0 04	Co	0 12
15	Ba	0 08		—		—	Mn	0 03	Ti	0 11
16	F	0 07		—		—	Ti	0 01	P	0 11
17	Cl	0 06		—		—	Cu	0 01	H	0 09
18	Cu	0 03		—		—	Remainder	0 03	Cl	0 09
19	N	0 02		—		—		—	Cu	0 01
20	Sr	0 02		—		—		—	Remainder	0 01
	Remainder	0 48		—		—		—		—

The data of Colums 2, 3, and 4 are taken from F W Clarke, U S Geol Survey, Bull 770, 1924 Those of Column 5 from Farrington, O C , (*Field Museum Nat History Publication* 120, 1907, *Publication* 151, 1911), whose report contains analyes of 318 iron and 125 stone meteorites Col 6 from Merrill, *Mem Nat Acad Sc* 14, p 28, 1916

acacatechin $C_{15}H_{14}O_6$ = 290 11 4-catechol-3 5 7-trihydroxychroman A constituent of *catechu*

acacia Gum arabic The dried, gummy exudation of *Acacia senegal*, etc , a Leguminosae Cf *babool, catechu* Oval beads used extensively in pharmacy for making suspensions, emulsions, tablets, or pills, also used in glues and pastes

acacipetalin $C_{11}H_{19}NO_6$ = 261 16 A cyanogetic glucoside, m 176, $[a]_D$ — 36 6°, from *Acacia* species

acadialite A variety of chabazite

acajou The fragrant heart wood of *Cedrela brasiliensis* (mahogany) **a balsam** An extract of the seeds of *Anacardium occidentale* (mahogany nuts) containing chiefly cardol and used as a blistering agent **a nut** Semecarpus

acalypha The Indian herb *A indica*, which is used as a substitute for ipecac

Acanthaceae A family of tropical plants comprising 175 genera and 1400 species Cf *adhatoic acid, ibogaine*

acanthite A native silver sulfide, Ag_2S, occurring in black, slender, prismatic needles, but rarer than the isomeric argentite, d 7 2 to 7 3

acari. A mite which flourishes on flour, grain, etc and has four pairs of walking legs

acaricide A mite killer Cf *insecticide*

acaroid resin Earth shellac, yellow resin, grass tree gum, botany bay gum, accroides gum, yacca gum The exudation of the stems of *Xanthorrhoea hastilis*, a Liliaceae of Australia

accelerated Increased in speed, motion, or force **a motion** The increase in the velocity of a body due to gravitation or other force

acceleration (1) *Chemical* A change in the speed of a chemical reaction, cf *catalysis* The a is *positive* if the reaction increases in speed, and *negative* if the reaction decreases in speed (2) *Physical* The increase in velocity per second, measured in cm per sec per sec for terrestial objects, and in m per sec per sec for astronomical objects Cf *force*

accelerator A substance which hastens or increases the speed of a chemical reaction Cf **as a** *catalyst, retarder* **catalyst-** Promoter **impregnation-** Introfier **rubber-** A compound which hastens and improves the curing of rubber, *e g* , thiocarbanilide, hexamethylenetetramine, diphenylguanidine, and triphenylguanidine Cf *vulcanization* **super-** A quick-acting vulcanizing agent, *e g* , thiuram and thiocarbamic acid derivatives **ultra-** Super-

acceptable explosives A group of unstable chemicals and mixtures which may be transported on railways and steamers subject to certain restrictions by the Bureau of Explosives

acceptor See *induced* reactions

accessory Supplementary in function **a food factors** Vitamins

accretion The increase in size of a body or mass by external addition, by the formation of additional deposits, or by adhesion, or inclusion

accroides gum Acaroid resin

accumulator A device for storing electricity, a storage or secondary battery or cell, as the lead accumulator, Edison, or Regnier cell, the action of which is based on a reversible chemical reaction **steam-** An iron vessel, similar to a boiler, in which steam is stored under pressure in contact with hot water

a metal An alloy containing 0 75 % Sb, 9 25 % Sn and 90 % Pb, used for a

ace- (1) A prefix indicating relationship to acetylene (or the ethylene radical) (2) The group, —C—C—, attached to a bicyclic system, as the carbon atoms 7 and 8 in acenaphthene Cf *aci-*

A C E mixture See *mixture*

acecoline A brand of acetylcholine hydrochloride

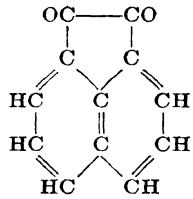
acedicon An alkaloidal isomer of acetylated codeine, in which the double bond is attached to the same C atoms as the acetylated enolic group, m 152–153

acenaphthene $C_{12}H_{10}$ = 154 1 Ethylene naphthalene, ethylene naphthene, 7 8-dihydroacenaphthylene $C_{10}H_6(CH_2)_2$ A hydrocarbon from coal tar distillates

Colorless needles, m 95, b 227°, d 1 0678 insoluble in water, and soluble in hot alcohol It is used in organic synthesis and the manufacture of dyes **bi-** Same as biacene **7, 8-diketo-** Acenaphthenequinone

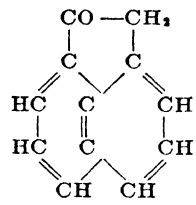
a dione Acenaphthenequinone

acenaphthenequinone $C_{12}H_6O_2$ = 182 2 Diketoacenaphthene, acenaphthenedione, 7 8-diketoacenaphthene The compound,



derived from acenaphthene Colorless crystals, m 261°, soluble in alcohol

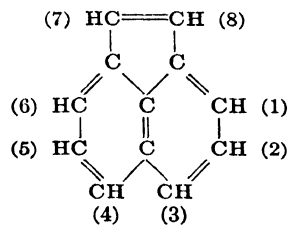
acenaphthenone $C_{12}H_8O$ = 168 2 The compound,



derived from acenaphthene Colorless crystals, m 121, and soluble in alcohol

acenaphthenyl The monovalent radical, $C_{12}H_9$—, derived from acenaphthene

acenaphthylene $C_{12}H_8$ = 152 1



An unsaturated hydrocarbon obtained from acenaphthene Colorless crystals, m 92, b 270, insoluble in water, but soluble in alcohol **7, 8-dihydro-** Acenaphthene

Acer The maples **A saccharum** The sugar maple

acerdese Manganite

acerdol Calcium permanganate

aceric acid An acid from the sap of the maple (*Acer rubrum*), supposed to be identical with malic acid

aceroides gum A misnomer for *acaroid resin*

acet (1) The trivalent radical, $CH_3C\equiv$ or $MeC\equiv$, as in *acetals*, $MeCH(OR)_2$ (2) The monovalent radical, Me CO—, derived from acetic acid (aceto)

acetal (*as'-e-tal*) $C_6H_{14}O_2$ = 118 14 Diethylacetal, 1,1-diethoxyethane*, acetol, ethylidene diethyl ether, diethylaldehyde, ethidene diethylic ether The compound, $MeCH(OEt)_2$ A volatile, colorless liquid, b 103, d 0 831, slightly soluble in water but soluble in alcohol or ether It is formed by imperfect oxidation of alcohol and is used medicinally as a hypnotic and as a solvent (Cf *acetals, hydrins*) **amino-** Aminoacetal **dichloro-** Dichloracetal **trichloro-** Trichloroacetal

acetaldehyde C_2H_4O = 44 04 Ethanal*, aldehyde, ethyl aldehyde, acetic aldehyde, Me CHO A volatile colorless liquid of aromatic odor m −123 5, b 20 8, d 0 806, soluble in water, alcohol or ether It is used commercially as solvent, industrially as a reducing agent, (silvering mirrors), and in the manufacture of dyestuffs and organic compounds **m-** Metaldehyde **p-** Paraldehyde **amino-** Glycinaldehyde **amyl-** Heptaldehyde **benzal-** Cinnamaldehyde **benzol-** Benzoyl **hydroxy-** Glycolaldehyde **keto-** Pyruvic aldehyde **met-** Metaldehyde **phenyl-** α-Tolualdehyde **tribromo-** Bromal **trichloro-** Chloral **trimethyl-** Pivaldehyde

a ammonia C_3H_7ON = 61 08 *1*-Aminoethanol, α-aminoethyl alcohol An addition compound of aldehyde and ammonia, CH_3-$CHOH\,NH_2$ A colorless solid, m 97, b 100, soluble in water **a cyanohydrin** C_3H_5OH = 71 06 The addition compound, CH_3CHOH-CN A liquid, b 183 (decomp), soluble in water or alcohol **a semicarbazone** C_3H_7-N_3O = 101 1 The addition compound Me-CH N NHCONH$_2$ A colorless solid, d 1 030, m 162

acetaldol Aldol

acetaldoxime Aldoxime

acetaldoxine Me CHNO = 58 05 Colorless crystals or a liquid, d 0 9645, m 13 or 47, b 114, soluble in alcohol

acetals (1) Dialkyl ethers of the hypothetical ethylidene glycol They are named as *1 1-*dialkoxy alkanes, i e, $CH_3CH(OR)_2$ = *1 1-*diethoxyethane (acetal) (2) Analogous ethers of higher or lower glycols, as, formal Cf *hydrins* **ketone-** Ketals

acetalphanaphthylamine Acetnaphthalide

acetamide C_2H_5NO = 59 05 Ethanamide* The amide of acetic acid, Me CO NH_2 Colorless crystals, m 82, b 222, d 1 139, readily soluble in water or alcohol Used in organic synthesis **acetyl-** Diacetamide **benzal-** Cinnamamide **benzyl-** α- is hydrocinnamamide, N- is benzylacetamide **bromo-** Acetbromamide **bromodiethyl-** Neuronal **cyan-** CN-CH_2 CO NH_2 = 84 1 Colorless crystals,

m 118 **di-** Diacetamide **dichloro-** $CHCl_2$-CO NH_2 = 127 98 Colorless, monoclinic crystals, m 98, b 233, soluble in alcohol, water or ether **hydroxy-** Glycolamide **methylphenyl-** Exalgin **N-phenyl-** Acetanilide *α*-**phenyl-** *α*-Toluamide

a chloride Me CCl_2 NH_2 = 113 0, b 90 **a nitrate** $C_2H_5N_2O_4$ or MeCO NH_3 ONO_2 = 121 1 Colorless crystals, formed by the action of nitric acid on acetamide

acetamidine $C_2H_6N_2$ = 58 1 Ethanamidine*, ethenylamidine The amidine of acetic acid, Mc C(NH)NH_2, m 166

acetamido Acetamino **a ethyl salicylic acid** Benzacetin **a phenetol** Phenacetin

acetamino Acetamido A compound containing the monovalent CH_3 CO NH— or MeCONH— radical **a naphthol** $C_{12}H_{11}NO_2$ = 201 16 1 2- White crystalline leaflets, m 235, insoluble in water and soluble in alcohol **1 4-** White crystalline needles, m 187, soluble in alcohol **a phenol** $C_8H_9O_2N$ = 151 12 The compound, C_6H_4(OH) NH CO Me **1 2-** White leaflets, m 201, soluble in hot water **1 3-** Colorless needles, m 149, soluble in water or alcohol **1 4-** Colorless monoclinic crystals d 1 293, m 168, soluble in water or alcohol **a, salol** Same as salophen

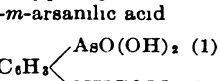
acetanilide C_8H_9ON = 135 12 Acetylaminobenzene, antifebrin, acetanil, phenylacetamide- The acetyl derivative of aniline, PhNH CO Me Colorless shining leaflets, m 114 2, b 303 8, d 1 211, soluble in water or alcohol Extensively used in medicine as an antipyretic, anodyne, antirheumatic and cardiac and also as a preservative (*e g*, for hydrogen peroxide solution) and in lacquers **aceto-** $MeCOCH_2$-CONHPh = 177 15 Colorless crystals, m 85, sparingly soluble in water or alcohol **acetyl-** Diacetanilide **amino-** $NH_2C_6H_4$ NH CO Me = 150 14 **p-** Colorless crystals, m 160, soluble in water, alcohol or ether Used in organic synthesis **brom-** Same as acetbromanilide **di-** PhN$(MeCO)_2$ = 177 1 Colorless leaflets, m 37, b $_{11mm}$142 ***ar*-ethoxy-** Acetphenetide ***p*-ethoxy-** Phenacetin ***ar*-methoxy-** Acetanside ***N*-methyl-** Exalgin ***ar*-methyl-** Acetotoluide **oxymethyl-** Methacetin *α*-**phenyl-** *α*-Toluanilide

a bromide Antisepsin

acetaniside $C_9H_{11}O_2N$ = 165 14 Methoxyacetanilide, C_6H_4(OMe)NH COMe **ortho-** Colorless crystals m 80, b 304, soluble in water **meta-** Methacetin

acetannin $C_{14}H_8(COCH_3)_2O_9$ = 406 2 Diacetyltannin, tannylacetate, tannigen The acetic acid ester of tannin, a light, creamy-white, odorless, tasteless powder, m 160, used in treatment of diarrhea

acetarsone $C_8H_{10}O_5NAs$ = 275 05 Stovarsol, acetylaminohydroxyphenylarsonic acid, *N*-acetyl-4-hydroxy-*m*-arsanilic acid



(4) HO—C_6H_3 (1) $AsO(OH)_2$ (3) NHCOMe

A white powder, slightly soluble in water or alcohol, readily in alkalis It is used in amebic dysentery and Vincent's infection Cf *carbarsone, tryparsamide*

acetate A salt of acetic acid containing the monovalent MeCOO— or CH_3COO— radical, abbreviated Ac Most normal acetates are freely soluble the least soluble are those of U, Hg and Ag Acetates are readily decomposed by strong acids or by heat

acetbromamide CH_2Br CONH_2 = 138 0 Bromacetamide Colorless leaflets, m 108, soluble in ether **N-** $CH_3CONHBr$ **diethyl-** Neuronal

acetbromanilide $BrC_6H_4NHCOCH_3$ = 214 0 **para-** p-bromacetanilide, antisepsin, asepsin, acetanilide bromide Colorless needles, m 165 5, sparingly soluble in water An antipyretic and antiseptic

acetene Ethylene

acetenyl Ethinyl The monovalent radical HC C—, derived from acetylene, *e g*, acetenylbenzene, Ph C_2H

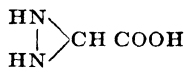
acet extract See *extract*

acethydrazide A compound containing the monovalent NH_2 NH CO CH_2— radical Cf *hydrazide*

acetic Compounds containing acetyl, CH_3CO— **a acid** Acetic acid **a aldehyde** Acetaldehyde **a anhydride** Acetic acid anhydride **a ester, a ether** Ethylacetate **a peracid** Peracetic acid **a peroxide** $(CH_3CO)_2O_2$ An explosive derivative of a anhydride

acetic acid $C_2H_4O_2$ = 60 04 Ethanoic acid*, ethylic acid, vinegar acid, acetone carboxylic acid, CH_3COOH (or MeCOOH or AcOH or incorrectly, HAc) A saturated fatty acid, *q v* (1) 99 5 % or glacial- A clear, colorless liquid or crystalline mass miscible with water or alcohol, d 1 048, m 16 b 118 It is used as a reagent as a solvent for essential oils, resins and gums, as a precipitant for albumin, and as a general neutralizing and acidifying agent (2) 36 % or common- A clear colorless liquid, d 1 049, miscible with water or alcohol (3) 6 % or dilute- An aqueous solution containing not less than 5 7 % nor more than 6 3 % of a a It is used as above and is an official test solution of the U S P It is produced by the oxidation of alcohol (vinegar), and in the pyroligneous acid resulting from the destructive distillation of wood **aceto-** Acetoacetic acid **acetyl-** Acetoacetic acid **allyl-** γ-Pentenoic acid **m-amidophenyl-** NH_2 C_6H_4 CH_2 COOH Colorless crystals m 149 **amino-** Glycine **aminobutyl-** Norleucine **benzal-** Cinnamic acid **benzamino-** Hippuric acid **benzoyl-** $C_9H_8O_3$ = 164 06 *β*-Ketohydrocinnamic acid, *3*-oxo-*3*-phenylpropanoic acid, $PhCOCH_2COOH$ Colorless needles, m 103 **benzyl-** Hydrocinnamic acid **bromo-** $C_2H_3O_2Br$ = 139 0 Bromoethanoic acid* Colorless hexagonal crystals d 1 011, m 50, b 208, soluble in water, alcohol or ether **butyl-** Caproic acid **carbamido-** Hydantoic acid **carbazyl-** Carbazolacetic acid **chloro-** $C_2H_3O_2Cl$ = 94 5 Chloroethanoic acid* Colorless, rhombic crystals, d 1 398, m 51, b 189 5, soluble in water, alcohol or ether **cyano-** Cyanacetic acid **di-** (1) Acetoacetic acid (2) Diacetic acid **diacetyl-** Diacetic acid **dibromo-** $C_2H_2O_2Br_2$ = 217 9 Dibromoethanoic acid* Colorless crystals, m 48, b 232, soluble in water, alcohol, or ether **dichloro-** $C_2H_2O_2Cl_2$ = 128 9 Dichloroethanoic acid* A colorless liquid, d 1 572, m −4, b 190, soluble in water, alcohol, or ether **dicarbamido-** Allantoic acid **diethyl-** $C_6H_{12}O_2$ = 116 1 3-carboxy-pentane, Et_2CH COOH A colorless liquid, d 0 920, b 190, slightly soluble in water **dihydroxy-** Glyoxylic acid **diiodo-** $C_2H_2O_2I_2$ = 311 97 Diiodoethanoic acid*

Yellowish crystals, m 110, slightly soluble in water **dimethyl-** Isobutyric acid **dimethylethyl-** $C_6H_{12}O_2$ = 116 13 The aliphatic acid $EtCMe_2COOH$ A colorless liquid, m −14, b 187, slightly soluble in water, soluble in alcohol or ether It is an isomer of caproic acid **dioctyl-** Isostearic acid **diphenyl-** $C_{14}H_{12}O_2$ = 212 17 $Ph_2CHCOOH$ Colorless needles, m 148, soluble in water, alcohol, or ether **diphenylene-** Fluorene carboxylic acid **ethoxy-** Ethylglycollic acid **ethyl-** Butyric acid **formyl-** Malonaldehydic acid **furfuryl-** Furoric acid **guanido-** Glycocyamine **hydrazi-** $C_3H_4O_2N_2$ = 88 0 The compound



hydroxy- Glycollic acid **imino-** $NH(CH_2COOH)_2$ = 133 1 Colorless rhombic crystals, m 227, insoluble in water and soluble in alcohol or ether **iodo-** $C_2H_3O_2I$ = 185 9 Iodoethanoic acid Yellow crystals, m 82, insoluble in water, soluble in alcohol or ether **isoamyl-** $C_7H_{14}O_2$ = 130 1 A colorless liquid, d 0 910, b 209, slightly soluble in water and soluble in alcohol **isobutyl-** *i*-Caproic acid **isopropyl-** Isovaleric acid **isopropylidene-** Senecioic acid **keto-** Pyruvic acid **mercapto-** $C_2H_4O_2S$ = 92 09 *2*-Mercaptoethanoic acid*, thioglycollic acid, $HS\,CH_2\,COOH$ A colorless liquid, d 1 3253, m −16 5, b_{6mm}101 **methoxy-** $C_3H_6O_3$ = 90 05 Methylethanoic acid*, methylglycolic acid, $MeOCH_2COOH$ Colorless liquid, d 1 1768, b_{7mm}90 **methyl-** Propionic acid **methylamino-** Sarcosine **nitro-** See *nitro acids* **oxybis-** Diglycollic acid **per-** Peracetic acid **phenyl-** Toluic acid **pyro-** Pyroligneous acid **sulfo-** $C_2H_4O_5S$ = 140 1 Sulfoethanoic acid* The compound $HSO_3\,CH_2\,COOH$ Colorless crystals, m 86, soluble in water **thiol-** C_2H_4OS = 76 09 Ethanethiolic acid*, thioacetic acid methanecarbothiolic acid, MeCOSH A colorless liquid, d 1 074, m −17°C, b 93, soluble in water **trimethyl-** Pivalic acid **triphenyl-** $C_{20}H_{16}O_2$ = 240 2 The compound $Ph_3C\,COOH$ Colorless crystals, m 264 **ureido-** Hydantoic acid **vinyl-** *β*-Butenic acid

a acid amide Acetamide **a acid amine** Acetamide **a. aldehyde** Acetaldehyde **a anhydride,** $C_4H_6O_3$ = 102 05 Acetic acid anhydride, acetyl oxide Ac_2O, acetic oxide, ethanoic anhydride* The compound $(MeCO)_2O$ A colorless liquid with pungent odor, d 1 081, m −73, b 137, soluble in alcohol or ether, decomp by water to acetic acid Used as a reagent in organic synthesis and analysis, for acetylation and in the examination of fats **a ester** Ethyl acetate **a ether** Ethyl acetate **a oxide** A anhydride **a peracid** Peracetic acid

acetidin Ethyl acetate

acetifier An apparatus for hastening the process of acetification, or the production of vinegar from fermented liquids by atmospheric oxidation

acetimeter An obsolete term for a hydrometer

acetimetry The determination of acetic acid in vinegar by titration with alkali

acetimido The monovalent radical $MeC(\,NH)—$

acetin Esters obtained by reaction of glycerol and acetic acid, *e g* , **mono-** Acetin, $C_3H_5(OH)_2(O\,COMe)$ = 134 11 A colorless liquid, d 1 2212, b 240 It is used in the manufacture of explosives (smokeless powder, dynamite), and as a solvent for dyes. **di-** See *diacetin* **tri-** See *triacetin*

acetmethylanilide Exalgin

acetnaphthalide $C_{12}H_{11}ON$ = 185 16 The compound, $MeCONHC_{10}H_7$ **1-**Acet-*α*-naphthylamine Colorless or slightly pinkish crystals, b 159, soluble in hot water or alcohol **2-**Acet-*β*-naphthylamine Colorless leaflets, m 132, soluble in hot water or alcohol

aceto Acet

acetocetanilide See *acetanilide*

acetoacetate A salt containing the monovalent $MeCOCH_2COO—$ radical derived from acetoacetic acid

acetoacetic acid $C_4H_6O_3$ = 102 07 Acetylacetic acid, diacetic acid, butanone acid, $Me\,CO\,CH_2\,COOH$ A colorless liquid, decomposed by heat at 100, into acetone and carbonic acid, and miscible with water or alcohol It is derived from *β*-hydroxybutyric acid in the body and increases in amount during diabetes Cf *acetone* **a ester** (1) Acetoacetic ether (2) A group of compounds derived from acetoacetic acid by replacing the acid hydrogen by an organic radical They are of the general type, $R—C_3H_4O\,COO—R$, and occur in two isomeric forms enolic-form, $R—CH_2\,CO\,CH_2\,COO—R$, and ketonic-form, $R—CH_2\,C(OH)\,CH\,COO—R$ **a ester condensation** The formation of acetoacetic esters by means of metallic sodium from the corresponding alkyl esters **a ester decomposition** The decomposition of acetoacetic esters, which may occur in two ways Strong acids or weak alkalis will split the ester to a ketone alcohol and carbon dioxide Strong bases will decompose it to acids (acetic acid, etc) **a ester synthesis** The formation of organic compounds by hydrolyzing their a esters **a ether** $C_6H_{10}O_3$ = 130 11 Ethyl-aceto-acetate, ethyl-*3*-oxobutanoate*, ethyl-acetoacetic ester ($MeCOCH_2COOEt$) A colorless liquid, $d_{20°}$ 1 0284, m −80, b 181, miscible water, alcohol, or ether It is used in organic synthesis, cf *a ester condensation decomposition*

acetoamidophenol Acetaminophenol

acetbenzoic anhydride Benzoyl acetate

acetobrom- Acetbrom-

acetocaustin Trichloracetic acid

acetochloral Chloral

acetocinnamene Benzylidene *acetone*

acetoglyceral $C_5H_{10}O_3$ = 118 08 Glycerol-ethylidene ether, $HO\,C_3H_5\langle{}^{O—CH_2}_{O—CH_2}\rangle$ A colorless liquid, d 1 081, b 184

acetoin $C_4H_8O_2$ = 98 1 3-hydroxy-2-butanone*, methylacetylcarbinol $MeCO\,CHOH\,Me$ or $Ac\,CHOH\,Me$, a condensation product of two molecules of acetic acid A colorless liquid, d 1 002, m 15, b 142

acetol $C_3H_6O_2$ = 74 06 Acetyl carbinol, 1-hydroxy-2-propanone,* propanolon, $MeCOCH_2OH$ A colorless liquid, d 1 082, m −17, b 145, it is soluble in water, alcohol or ether Used as a reducing agent in organic synthesis

acetoluide Acetotoluide

acetolysis The breaking up of an organic molecule by acetic anhydride or acetic acid

acetometer An instrument for the determination of acetic acid

aceton acid Acetonic acid

acetonamine A group of organic compounds containing both the $NH_2—$ and $CO—$ radicals **di-** $NH_2\,CMe_2\,CH_2\,CO\,Me$

acetonaphthone Naphthylmethyl ketone **1-hydroxy-2-** $C_{12}H_{10}O_2$ = 186 08 *1*-Hydroxy-*2*-naphthylmethylketone, *2*-acetyl-*1*-naphthol, $MeCOC_{10}H_6OH$ Yellow needles, m 100, b 325

acetone C_3H_6O = 58 06 Dimethylketone, 2-propanone*, methylacetal, ketopropane, dimethylketal, $CO(Me)_2$ A clear, colorless, inflammable liquid of characteristic ethereal empyreumatic odor, d 0 792, m −94 3, b 56 5, miscible with water, alcohol or ether It is a constituent of wood spirit, and is formed in the body during diabetes by decarboxylation of acetoacetic acid Used as a solvent for oils, fats, resins, cellulose nitrate, as a precipitant for albumin, as reagent for aniline dyes, cuprous and silver salts, alkaloids and blood, and medicinally as an anthelminthic and tonic **acetonyl-** See *acetonyl* **acetyl-** Acetylacetone **allyl-** Allylacetone **amido-** Aminoacetone **benzal-** $C_{10}H_{10}O$ = 146 08 *4*-Phenyl-*3*-butene-*2*-one*, benzylidene acetone, cinnamyl methyl ketone, acetocinnamene, methyl styryl ketone, cinnamyl methyl ketone The compound, PhCH CH COMe Colorless crystals, m 41, b 262, insoluble in water, soluble in alcohol, ether or chloroform Used in organic synthesis **benzylidene-** Benzal a **bromo-** Monobromacetone CH_2Br CO Me = 136 98 A colorless liquid, b 140, soluble in alcohol **chloro-** Monochloracetone CH_2Cl CO Me = 92 51 A colorless liquid, d 1 162, b 119, slightly soluble in water, but miscible with alcohol or ether **diamido-** $CO(CH_2NH_2)_2$ = 88 1 **dibenzal-** Styryl ketone **dichloro-** (alpha-) $CHCl_2$ CO CH_3 = 126 95 A colorless liquid, d 1 572, m −4, b 190, soluble in water, alcohol or ether (beta-) CH_2Cl CO CH_2Cl = 126 95 A colorless liquid, d 1 236, b 120, soluble in water, alcohol or ether **diethoxy-** $CO(CH_2OEt)_2$ **disonitroso-** $CO(CH\ NOH)_2$ Colorless crystals, m 144, **dimethoxy-** $CO(CH_2OMe)_2$ **dioxy-** $CO(CH_2OH)_2$ **ethoxy-** See *ethoxyacetone* **ethylidene** *3*-Penten-*2*-one * **hydroxy-** Acetol **meta-** Diethyl ketone **monobromo-** See *bromo-* **monochloro-** See *chloro-* **oxalyldi-**, Me CO CH_2 CO CO CH_2 - CO Me Colorless crystals, m 120, insoluble in water but soluble in alcohol **sulfocyan-** MeCO CH_2 SCN A colorless liquid, d 1 180, soluble in water or alcohol

a acid Acetonic acid **a alcohol** Acetol **a bodies** The aliphatic ketones and hydroxyketones found in blood and urine **a bromoform** $CHBr_3$ = 331 1 Brometone, 1, 1, 1-tribrom-2-methyl-propan-2-ol, tribrom-tert -butanol CBr_3 COHMe_2 Colorless crystals, used medicinally as a sedative **a. carboxylic acid** Acetic acid **a chloride** $C_3H_6Cl_2$ = 112 98 *2 3*-Dichloropropane* MeCCl$_2$Me, d - 1 83 at 16°C, m −35, b 69 **a chloroform.** $C_4H_7OCl_3$ = 177 1 Chloretone, chlorbutanol, 1,1,1-trichlor-2-methyl-propan-2-ol, trichlor-tert -butylalcohol, aneson, anesin, CCl_3.CMe_2-OH Colorless crystals, m 80, slightly soluble in water, but more soluble in alcohol, glycerol or oils Used in hypodermic solutions as an antiseptic, hypnotic and anesthetic **a. collodium** Collodion **a cyanhydrin** Me_2C - OH CN = 85 1 m −20, b 120 **a diacetic acid** Hydrochelidonic acid **a dicarboxylic acid** $C_5H_6O_5$ = 146 1 *β*-ketoglutaric acid, *β*-oxyglutaric acid, pentanone diacid, *3*-oxo-pentanedioic acid* The dibasic acid, CO-$(CH_2COOH)_2$, which occurs in colorless crystals, m 130, decomp 250 **a oil** The oily residue from the distillation of crude acetone Used as a solvent, a denaturating agent and in the purification of anthracene **a phenyl hydrazone** $C_9H_{12}N_2$ = 148 2 The crystalline compound Me_2 C N NPh, m 16, b 165 (90 mm) **a semicarbazone** $C_4H_9ON_3$ = 115 12 The crystalline compound Me_2 C N NH $CONH_2$, m 190 **a sodium bisulfite** $NaSO_3$ CMe_2OH Colorless crystals which are soluble in water **a sugar** Isopropylidine sugar A condensation compound of sugar and a containing a —O CMe_2 O— group

acetonic acid $C_4H_8O_3$ = 104 1 Acetone acid, butyl-lactic acid, *α*-hydroxyisobutyric acid $Me_2C(OH)COOH$ Colorless crystals, m 79, b 212, soluble in water, alcohol or ether

acetonitrile C_2H_3N = 41 1 Methylcyanide, ethanenitrile*, cyanomethane The nitrile of acetic acid, Me CN, which occurs in coal tar and the residue of molasses A colorless liquid, d 0 783, m −44, b 81, soluble in water or alcohol Used in organic synthesis and perfumery **allyl-** See *allyl* **amino-** Glycinonitrile **benzoyl-** C_9H_7ON = 145 06 Cyanoacetophenone, *β*-ketohydrocinnamonitrile, $PhCOCH_2CN$ White leaflets, m 80 **phenyl-** Is *α*-tolunitrile **triethoxy-** Cyanoformic ester, oxalnitrilic ethyl ester The compound, $(EtO)_3C$ CN A colorless liquid, b 160 **trinitro-** $(NO_2)_3C$ CN Colorless crystals, m 41 **trinitro-** $C_2N_4O_6$ = 176 03 Trinitroethanenitrile*, CN $C(NO_2)_3$ White waxy leaflets, m 41 5, exploding on further heating **vinyl-** Allylcyanide

acetonitrolic acid $C_2H_4N_2O_3$ = 104 05 Ethylnitrolic acid, $Me(NO_2)C$ NOH Yellow rhombic crystals, m 88 (decomp) soluble in water

acetonuramic acid MeCO CH_2 NH CH_2 - $COONH_2$ = 146 2

acetonyl The monovalent radical, CH_3 CO CH - or $MeCOCH_2$– **a acetone** $C_6H_{10}O_2$ = 114 1 Hexan-*2*, 5-dione, g-diketohexane, *2*, *5*-hexane dione* *γ*-diketo-hexane The diketone Me - CO CH_2CH_2 CO Me A colorless liquid of pleasant odor, b 188 used as a solvent **a amine** *1*-Amino-*2*-propanone **a urea** C_5-$H_8O_2N_2$ = 123 1, m −41, b 175, very soluble in water, alcohol or ether

acetonylidene The divalent radical, MeCOCH=

acetophenetide $C_{10}H_{13}O_2N$ = 179 16 **p-** Phenacetin, p-ethoxyacetanilide, acetphenetidine, oxyethylacetanilide 1,4-EtO C_6H_4 NH COMe A colorless, crystalline powder, m 134, soluble in 1500 pts water, 16 pts alcohol or 90 pts ether Used medicinally as an antipyretic, analgesic and antirheumatic **o-** *N*-acetyl-*o*-phenetidine Colorless leaflets, m 79 **amino-** Phenocoll

acetophenine $C_{24}H_{19}N$ = 321 3 Colorless crystals, m 135, slightly soluble in alcohol

acetophenetidin The U S P XI name for *acetophenetide*

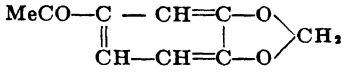
acetophenone C_8H_8O = 120 1 Phenylmethylketone, benzoyl hydride, acetyl benzene, hypnone Me_2CO Ph A colorless liquid or transparent crystals, m 20 5, b 202, d 1 0285, insoluble in water, but soluble in alcohol, ether, chloroform or oils Used medicinally as a hypnotic, and also in perfumes (orange blossoms) **allyl-** The compound, Ph CO CH_2 - CH_2 CH CH_2 A colorless liquid, b 236, soluble in alcohol **amido-** Amidoacetophenone **benzal-** Chalcone **benzyl-** *phenyl* propiophenone **chloro-** See *tear* gases **cyano-**

Benzoyl acetonitrile *ar*-**hydroxy-** See *hydroxy* **ω-hydroxy-** $PhCOCH_2OH$ Phenacyl alcohol Colorless crystals, d 1 013, m 86 **nitroso-** Benzoylformoxime **phenyl-** Acetophenone **acetone** $C_{11}H_{12}O_2$ = 176 1 Phenyl acetyl acetone, $PhCO\,CH_2\,CH_2\,COMe$ **a carboxylic acid** Acetyl benzoic acid **a oxime** $Me\,C(NOH)\,Ph$ = 135 2 Colorless crystals, m 59

acetophenones The homologs of acetophenone

$PhCOCH_2—R$	acidulated benzenes
$Ph—R—COMe$	phenylated fatty ketones
$R—C_6H_4\,COMe$	nucleus substituted phenones

acetopiperone $C_9H_8O_3$ = 164 1 3 4-methylenedioxy-1-methylketo-benzene



Colorless crystals, m 87

acetopyrine $C_{11}H_{12}N_2O\,C_2H_7OOC_6H_4COOH$ Acopyrin A combination of antipyrine and acetyl salicylic acid, used for fevers and rheumatism

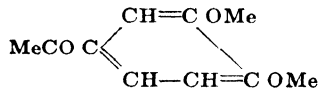
acetosalicylic acid Acetylsalicylic acid

acetotoluide $C_9H_{11}ON$ = 149 09 Acetotoluidine, *ar*-methylacetanilide, *N*-acetyl-*o*-toluidine, $Me\,C_6H_4\,NHCOMe$ **ortho-** Colorless crystals, m 107, b 296°, slightly soluble in water and soluble in alcohol or ether Used medicinally as an antipyretic, and said to be less toxic than acetanilide **meta-** Colorless crystals, m 65, b 303 **para-** Colorless needles, m 151, b 307, slightly soluble in water or alcohol Used medicinally as an antipyretic Cf *exalgin* ***N*-methyl-** $C_{10}H_{13}NO$ = 163 11 *N*-acetyl-*N*-methyl-*o*-toluidine $MeCON(Me)\,C_6H_4Me$ White crystals, m 56, b 260, soluble in alcohol

acetothienone Thienylmethylketone

acetotoluidine Acetotoluide

acetoveratrone $C_{10}H_{12}O_3$ = 180 1 3 4-dimethoxy-1-methylketo-benzene



Colorless crystals, m 48, soluble in alcohol Used in perfumery

acetoxime C_3H_7ON = 73 08 Propanoxime, *2*-propanone oxime*, acetone oxime The simplest ketoxime which occurs in two isomeric forms, as, the compound, $Me_2C\,NOH$ Colorless prisms, d 0 887, m 58, b 135, soluble in water, alcohol or ether

acetoximes A group of ketoximes derived from acetoximes and occurring in two isomeric forms, as,

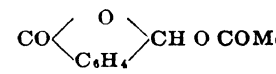
anti- syn-

where *R′* is a radical of greater radical weight than R

acetoxy The monovalent radical AcO—, or MeCOO— or $CH_3\,COO$—

acetoxylide $C_{10}H_{13}NO$ = 163 11 Aceto-*as-m*-xylidide, *2,4*-dimethylacetanilide, $MeCONHC_6H_3Me_2$ White needles, m 129

acetoxyphthalide The compound,



acetozone Acetylbenzoyl peroxide An unstable compound, which is slightly soluble in water or ether and is marketed as a 50 % mixture of an inert substance as a disinfectant and antiseptic

acetphenetid Acetophenetide

acet-theocin sodium Acet-theophylline sodium, soluble theocine, theophylline sodium acetate A white powder which is soluble in water but insoluble in alcohol or ether Used medicinally as a diuretic

acettoluide Acetotoluide

acetum Latin for vinegar

aceturic acid Acetyl glycine

acetyl Symbol Ac The monovalent acyl radical, MeCO- or CH_3CO-, of which acetic acid and acetyl chloride are the hydroxide and chloride, respectively **a hydrate** Acetic acid **a number** A measure of the amount of oxyacids and alcohols in a vegetable or animal fat It is the number of milligrams of potassium hydroxide required to neutralize the acetic acid obtained by saponification of one gram of a fat wax which has been acetylated with acetic anhydride Cf *Cook formula* **a value** Same as a number

acetylacetonate A compound of acetylacetone with aluminum beryllium or rare earth, of the type, $M[CH\text{-}(COMe)_2]_3$

acetylacetone $C_5H_8O_2$ = 100 09 Pentane-2 4-dione, *2 4*-pentane dione* The diketone, $MeCO\,CH_2\,COMe$ A colorless liquid, d 0 987 b 137, slightly soluble in water but miscible with alcohol or ether Used in organic synthesis

acetylamine (1) The monovalent radical, MeCONH- or $CH_3\,CO\,NH$-, derived from acetamide (2) Acetamide

acetylamino Acetylamine **a acetic acid** Acetyl glycine **a benzoic acid** $MeCONH—C_6H_4—COOH$ = 179 13 **ortho-** Colorless needles, m 185, slightly soluble in water, and soluble in alcohol or ether **meta-** Colorless crystals, m 243, decomp , slightly soluble in water, alcoholor ether **para-** Colorless needles, m 250, slightly soluble in water or ether but soluble in alcohol **a phenetole** Acetphenetid **a salol** Salophen

acetylate To introduce an acetyl radical into an organic compound

acetylation The process of introducing an acetyl radical into an organic molecule, *e g* , by boiling the compound with glacial acetic acid or acetyl-chloride

acetylbenzene Acetophenone

acetylbenzoate Benzoyl acetate

acetylbenzoic acid Acetophenone carboxylic acid $C_9H_8O_3$ = 164 11 The compounds $MeCO\,C_6H_4COOH$ **ortho-** Crystals, m 114, soluble in hot water **para-** Crystals, m 205 (subliming), and slightly soluble in water, alcohol or ether

acetylbiuret $MeCO\,NH\,CO\,NH\,CO\,NH_2$ = 145 11 Colorless needles, m 193, soluble in water, alcohol or ether

acetylbromide C_2H_3OBr = 122 95 Ethanoyl bromide* The compound, $Me\,COBr$ A colorless fuming liquid, m −96 5, b 76 7, decomposes in water or alcohol but is soluble in

ether Used as a reagent in analysis and organic synthesis **bromo-** $C_2H_2Br_2O$ = 201 85 Bromoethanoyl bromide*, $CH_2Br\ COBr$ Colorless liquid, b 148, decomposed by water

acetylcannabinol The compound, $MeCO\ O\ C_{21}H_{29}O$, obtained by heating cannabinol with acetic acid anhydride

acetylcarbamide Acetylurea

acetylcarbazole $C_{12}H_8N\ COCH_3$ = 209 2 A crystalline solid, m 70, b 360, slightly soluble in water, very soluble in alcohol or ether

acetylcarbinol Acetol

acetylcarbromal $C_9H_{15}N_2O_3Br$ = 279 03 Abasin, acetylbrom-diethyl-acetyl-carbamid, $BrCEt_2\ CO\ NH\ CO\ NH\ COMe$ White crystals, slightly soluble in water, readily in alcohol Used as sedative

acetylchloride C_2H_3OCl = 78 49 Ethanoyl chloride* $Me\ COCl$ A colorless fuming liquid, d 1 105, m −112, b 55, decomposes in water or alcohol but is soluble in ether Used as a reagent in analysis and in organic synthesis **chloro-** $C_2H_2Cl_2O$ = 112 93 Chloroethanoyl chloride*, $CH_2Cl\ COCl$ A colorless liquid, b 107, d 1 495, decomposes in water or alcohol **dichloro-** $CHCl_2\ COCl$ = 147 37 Dichloroethanoyl chloride* A colorless liquid b 105, decomposes in water or alcohol Used in organic synthesis **trichloro-** CCl_3COCl = 181 83 Colorless liquid, d 1 629, b 118, decomposed by water **trimethyl-** Pivalyl chloride

acetylcholine $C_7H_{17}O_3N$ = 163 2 Acetylethanol-trimethyl-ammonium hydroxide $CH_3\ CO\ OCH_2\ CH_2\ NMe_3\ OH$ An alkaloid from ergot which lowers the blood-pressure and increases peristalsis **a hydrochloride** $Me_3NClC_2H_4COOMe$ Acecoline White hygroscopic crystals of characteristic odor Used as vasodilator

acetylcyanide C_3H_3ON = 69 1 Pyruvonitrile $Me\ COCN$ A colorless liquid, b 93

acetylene (1) A member of the acetylene series (2) C_2H_2 = 26 03 Ethine ethyne* An unsaturated hydrocarbon and the simplest compound containing a triple bond, $HC{\equiv}CH$ A colorless gas with garlic odor, d 0 91, m $_{895mm}$ −85, b −83, slightly soluble in water but soluble in alcohol It is used as a general anesthetic, technically for oxy-acetylene welding, and cutting of metals, in organic synthesis, and as an illuminant It is produced by the action of water on calcium carbide and is shipped in steel cylinders (red label) (3) The tetravalent radical, $=CH\ CH=$ **butyl-** Hexyne* **carboxy-** Propiolic acid **di-** Diacetylene **dimethyl-** Crotonylene **diphenyl-** Tolane **ethyl-** Butyne* **hexyl-** Caprilidene **methyl-** Allylene **pentyl-** Heptyne* **phenyl-** Acetenylbenzene $PhC{\equiv}CH$ A colorless liquid, b 139, soluble in alcohol **phenylmethyl-** Phenylallylene $PhC{\equiv}CMe$ A colorless liquid, b 185, soluble in alcohol **propyl-** Pentine **vinyl-** Vinylacetylene

a acids Tetrolic acids A series of organic acids of the general formula $C_nH_{2n-3}COOH$, which contain the bivalent —C C— group, as,

propiolic acid, propynoic acid*	$HC\ C\ COOH$
tetrolic acid, *2*-butynoic acid*	$MeC\ C\ COOH$
pentinoic acid, *2*-pentynoic acid*	$EtC\ C\ COOH$
amylpropiolic acid	$C_5H_7C\ CCOOH$
palmitolic acid	$C_{14}H_{27}C\ COOH$
stearolic acid	$C_{17}H_{31}C\ CCOOH$
behenolic acid	$C_{21}H_{39}C\ CCOOH$

a alcohols A group of organic compounds which contain both an OH- and —C C— group, as,

propin-3-ol, *2*-propyn-*1*-ol*	$HC\ C\ CH_2OH$
butin-3-ol, *2*-butyn-*1*-ol*	$MeC\ C\ CH_2OH$

a carboxylic acid Propiolic acid **a dicarboxylic acid** $C_4H_2O_4$ = 114 0 Butynedioic acid* $HOOC\ C\ C\ COOH$ Colorless crystals, m 178, insoluble in water Cf glutinic acid, muconic acid **di-** Diacetylene dicarbonic acid $HOOC\ C\ C\ C\ C\ COOH$ **tetra-** Tetracetyl dicarbonic acid $HOOC\ (C\ C)_4\ COOH$ **a dichloride** $C_2H_2Cl_2$ = 96 95 Dioform, dichloroethylene, $CHCl = CHCl$ *cis*-d 1 269, m −50°C, b 48 4 *trans*-d 1 291, m −80 5, b 60 3 Colorless liquids, immiscible with water but miscible with alcohol or ether **a dinitrile** C_4N_2 = 76 0 Carbon subnitride $NC\ C\ C\ CN$ **a diurein** Glycoluril **a series** Alkines, ethines A group of unsaturated hydrocarbons of the general formula C_nH_{2n-2} which contain a triple bond, —C C—

C_2H_2	ethyne*, ethine, acetylene
C_3H_4	propyne*, propine, allylene
C_4H_6	butyne*, butine, crotonylene
C_5H_8	pentyne*, pentine, valerylene
C_6H_{10}	hexyne*, hexine, hexoylene
C_7H_{12}	heptyne*, heptine, oenanthylidene
C_8H_{14}	octyne*, octine, caprylidene
$C_{10}H_{18}$	decyne*, decine, menthene
$C_{12}H_{22}$	dodecyne*, dodecylidene
$C_{13}H_{24}$	tridecyne*, tridecylidene
$C_{14}H_{26}$	tetradecyne*, tetradecylidene
$C_{15}H_{28}$	pentadecyne*, pentadecine, benylene
$C_{16}H_{30}$	hexadecyne*, hexadecine, cetenylene
$C_{18}H_{34}$	octodecyne*, octadecylidene

a stones Acetylith **a tetrabromide** $C_2H_2Br_4$ = 345 71 Tetrabromoethane, Muthmann's liquid $CHBr_2\ CHBr_2$ A yellow oily liquid, d 2 973, b 136 (36 mm), insoluble in water and miscible with alcohol or ether Used for the separation of mineral mixtures and in microscopy **a tetrachloride** Tetrachloroethane **a urea** $C_2H_2(CON_2H_2)_2$ = 142 11 A liquid, decomp 300°C

acetylfluoride C_2H_3OF = 62 03 Ethanoyl fluoride* $MeCOF$ A colorless liquid, d 1 0369, m −55, b 10, miscible with ether and decomposing in alcohol or water Used in organic synthesis

acetylformic acid Pyruvic acid

acetylglycine $C_4H_7O_3N$ = 117 09 Acetylaminoacetic acid, aceturic acid $MeCO\ NH\ CH_2\text{-}COOH$ Colorless crystals, m 206, decomp 130, soluble in water or alcohol but insoluble in ether

acetylide A derivative of acetylene in which the hydrogen atoms are replaced by metals, as,

cuprous acetylide	Cu_2C_2
cobalt acetylide	CoC_2
silver acetylide	Ag_2C_2

acetylidene The hypothetical isomer of acetylene, $C{=}CH_2$, in which it is assumed that one carbon atom is divalent

acetyliodide C_2H_3OI = 169 16 Ethanoyl iodide* $MeCOI$ A brown fuming liquid, d -

1 98, b 107 It is used for acetylation in organic synthesis

acetylith Acetylene stones Sugar-coated granules of calcium carbide used for the generation of acetylene

acetylization Acetylation

acetylize Acetylate

acetylperoxide $C_4H_6O_4$ = 118 07 Ethanoyl peroxide* $(MeCO)_2O_2$ Colorless leaflets, m -30, b 63, slightly soluble in water and soluble in alcohol or ether

acetylphenol $C_8H_8O_2$ = 136 10 PhO COCH$_3$ A colorless liquid, d 1 092 at 0, b 193

acetylphenylene diamine (p) $C_8H_{10}ON_2$ = 150 14 Amino-acetanilide Me CO NH - C_6H_4 NH_2 Colorless needles, m 159, slightly soluble in water, and very soluble in alcohol or ether Used medicinally and in organic synthesis

acetylphenylhydrazine Pyrodin

acetylpropyl alcohol $C_5H_{10}O_2$ = 102 11 The hydroxy ketone, MeCO CH_2 CH_2 CH_2OH A colorless liquid, d 1 0159, b 208, miscible with water, alcohol or ether, and used as a solvent

acetylrosaniline $C_{20}H_{18}N_3COMe$ = 343 3 Red crystals, m 218, soluble in alcohol, carbon disulfide or chloroform, insoluble in water or ether

acetylsalicylate A compound containing the monovalent MeCO C_6H_4 COO—radical, derived from acetylsalicylic acid

acetylsalicylic acid $C_9H_8O_4$ = 180 06 Aspirin, xaxa, acid aceticosalicylas, acetosal, acetosalic acid, acetophen, salacetin The acetate derivative of salicylic acid, MeCOO C_6H_4 COOH (1 2) A colorless crystalline powder, m 135, slightly soluble in water and soluble in alcohol or ether and with decomposition, in alkaline solutions Used extensively in the manufacture of tablets, as an antirheumatic and antipyretic **a methyl ester** Methyl acetylsalicylate

acetylsalol Spiroform

acetyltannin Tannigen

acetylthymol $C_{12}H_{16}O_2$ = 192 1 Thymylacetate A slightly yellow liquid, d 1 009, b 244, used medicinally as an antiseptic

acetyltropeine $C_{10}H_{17}O_2N$ = 183 2 MeCO $C_8H_{14}ON$ A syrupy liquid b 236, soluble in water, alcohol or ether

acetylurea $C_3H_6O_2N_2$ = 102 08 Acetylcarbamide MeCO NH $CONH_2$ Colorless crystals, m 218°C slightly soluble in water or alcohol

Achard, Franz Karl 1753–1821 A German chemist, and pioneer in the manufacture of sugar from beets

achilleic acid An acid obtained from *Achillea millefolium*, identical with aconitic acid

achilleine $C_{20}H_{38}O_{15}N_2$ = 546 4 An alkaloid from *Achillea millefolium*, yarrow, or milfoil Brownish-red masses of bitter taste, soluble in water Sometimes used as an antipyretic

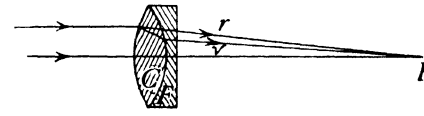
achilletin $C_{11}H_{17}O_4N$ = 227 0 A split-product obtained from achilleine by the action of sulfuric acid

achmatite, achmite An epidote from the Ural Mountains

achrodextrins Achroodextrins

achroite A colorless tourmaline from Elba

achromatic Transmitting white light without breaking it up into colored rays Cf *apochromatic, chromatic, pantachromatic* **a lens** A combination of lenses of different refractive indices with which chromatic aberration is corrected by bringing two spectral color rays to a common focus A combination of a convex lens of crown glass with a concave lens of flint glass **a objectives** Any system of lenses which brings light of different wave-lengths to a common focus, *i e*, avoids chromatic aberration **a substage** A device for microscopes which corrects chromatic aberration **a system** Any combination of prisms or lenses with a common focus for different colors, *e g*, an achromatic lens



Achromatic lens

C = *crown glass* *r* = *red ray*
F = *flint glass* *v* = *violet ray*
F = *focus*

achromic Without color **a method** The evaluation of diastase preparations by means of the **a period** **a period** The time needed for a 1 % starch solution to reach the **a point**, *i e*, become transformed into achroodextrin **a point** That point in the hydrolysis of starch by enzymes when iodine no longer produces a blue color

achromobacteria Small Gram-negative bacteria, usually motile They produce no pigment c gas on gelatin, but a brown color on potato

achroodextrins $C_{36}H_{62}O_{31}$ = 990 7 A series of intermediate split products that are formed after erythrodextrin by the hydrolysis of starch or dextrin, termed alpha-, beta-, etc They are not colored blue by iodine, and are converted into glucose by boiling with dilute acid

aci A prefix that indicates acid character, as in aci-phenylnitromethane, PHCH NO(OH), which differs from α-phenyl nitromethane, $PhCH_2$ - NO_2 Cf *ace*

acicular Slender, needle-like or hair-like in shape, as crystals or bacteria **a oxylepidine** Di-benzoyl *stilbene*

acid (1) A chemical compound which yields hydrogen ions when dissolved in water whose hydrogen can be replaced by metals or basic radicals, or which reacts with bases to form salts and water (neutralization) Antonym base (2) An extension of the term includes substances dissolved in media other than water Cf *base, ammonia system* (3) Any substance which gives up protons (*proton donor*) or which reacts as $A \rightleftharpoons B + H^+$, where A is acid and B is base (Bronsted, Lowry, etc) *e g*,

$$HAc \rightleftharpoons Ac^- + H^+$$
$$H_2O \rightleftharpoons OH^- + H^+$$
$$H_3O^+ \rightleftharpoons H_2O + H^+$$
$$HSO_4^- \rightleftharpoons SO_3^{--} + H^+$$
$$NH_4^+ \rightleftharpoons NH_3 + H^+$$

NH_4^+ and H_2O are acids, while Ac^- and SO_3^- are bases Cf *protophilia*

A-, α-, β- See *A* and *sulfonic acids* **acrylic-** An organic a of the general type, $C_nH_{2n-2}O_2$ **alcohol-** See *alcohol* **aldehyde-** An organic a containing aldehyde and carboxyl radicals **aliphatic-** An a derived from chain-compounds, *e g*, acrylic and fatty acids **amic-** Amido acid **amido-** An organic acid containing the monovalent —$CONH_2$ group and the carboxyl radical **amino-** An organic a containing the monovalent

—NH_2 and —COOH groups **aromatic-** An organic compound containing a closed chain (*e g*, benzene ring) and the carboxyl group **battery-** Electrolyte a Sulfuric acid of d 1 150–1 835 **bromo-** An organic a containing bromine **carboxylic-** See organic acids **carbylic-** See carbylic acids **chloro-** An organic a containing chlorine **diatomic-** An a containing two hydrogen atoms which are replaceable by metals or basic radicals Cf oxalic acids, fumaric acids **dibasic-** Same as diatomic **dihydric-** Same as diatomic **dihydroxy-** An organic a containing two hydroxy groups and one or more carboxyl groups **effective-** See acidity **electrolyte-** Battery a **fatty-** An organic a of the general type, $C_nH_{2n}O_2$ **halogen-** An inorganic a containing a halogen as, HCl, $HClO_3$ **haloid-** An inorganic a containing a halogen element and no oxygen *e g*, HCl, HBr **hexabasic-** Hexatomic **hexatomic-** An a containing six hydrogens replaceable by metals or basic radicals **hydrogen-** Hydracid **hydroxy-** An organic a containing one hydroxy group and one or more carboxyl groups Cf *phenol* acids **inorganic-** A compound of hydrogen with a nonmetal other than carbon, or an acid radical containing no carbon **labile-** A grouping such as the —SO_3H or —OSO_3H groups the acidic properties of which are unstable and depend on the other groups present **meta-** (1) An inorganic a of a trivalent nonmetal containing one replaceable hydrogen, *e g*, HPO_2, HBO_2, etc (2) An organic, aromatic a with radicals in the meta-position **mineral-** Inorganic a **mixed-** A mixture of nitric acid and sulfuric acid used for nitration **monamino-** An organic a containing one amino group and one or more carboxyl groups **monatomic-** An a having only one hydrogen atom which can be replaced by metals or basic radicals **mono- amino-** Monamino a **monoatomic-, monobasic-, monohydric-** Monatomic **monohydroxy-** An organic a containing one hydroxy group and one or more carboxyl groups **nitro-** See nitro acid, nitroic acid, etc **normal-** (1) Inorganic ortho- a (2) A straight chain fatty a , as, *n*-valeric acid (3) A solution containing one gram-equivalent a per liter, as, *N*-HCl **organic-** Any carbon compound containing one or more carboxyl groups —COOH This radical is indicated by the *prefix* carboxy, or the *suffixes* carboxylic, carbonyl or simply -oic or -oyl For classification, see *acids* **ortho-** (1) An inorganic a of trivalent elements containing three hydrogen atoms replaceable by basic radicals, *e g*, H_3PO_4 (2) An organic a containing a closed chain (*e g*, benzene ring) and radicals in the ortho position **oxy-** (1) An inorganic a containing oxygen, thereby differing from the haloid or hydrogen acids Those of the type having least oxygen have the suffix *-ous*, those having most oxygen, the suffix *-ic* (2) An organic a containing an ether or oxy group in addition to the carboxyl

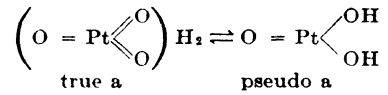
COMMON ACIDS, RADICALS AND SALTS

Acid	*Radical or ion*	*Salt*
acetic	CH_3COO—	acetate
adipic	—$OOC(CH_2)_4COO$—	adipate
anisic	$C_6H_4OCH_3COO$—	anisate
arsenic	$AsO_4\equiv$	ortho-arsenate
	AsO_3—	meta-arsenate
arsenous	$AsO_3\equiv$	ortho-arsenite
	AsO_2—	meta-arsenite
	$As_2O_5\equiv$	pyro-arsenite
benzoic	$PhCOO$—	benzoate
boric	$BO_3\equiv$	ortho-borate
	$B_4O_7=$	pyro-borate
	$BO_2=$	meta-borate
	BO_3—	perborate
bromic	BrO_3—	bromate
bromous	BrO_2—	bromite
butyric (n)	$Me(CH_2)_2COO$—	butyrate
camphoric	$C_8H_{14}(COO)_2=$	camphorate
capric	$Me(CH_2)_8COO$—	caprate
caproic (n)	$C_5H_{11}COO$—	caproate
carbolic	same as phenol	
carbonic	$CO_3=$	carbonate
	HCO_3—	bicarbonate
cerotic	$C_{26}H_{53}COO$—	cerotinate
chloric	ClO_3—	chlorate
chlorous	ClO_2—	chlorite
chromic	$CrO_4=$	chromate
	$Cr_2O_7=$	dichromate
chromous	$CrO_2=$	chromite
cinnamic	$PhCH\ CHCOO$—	cinnamate
citraconic	—$OOCMeC\ CHCOO$—	citraconate
citric	$C_3H_4(OH)(COO)_3\equiv$	citrate
cresotinic	$C_6H_3(OH)MeCOO$—	cresotinate
cresylic	Same as cresol	
cyanacetic	$NC\ CH_2\ COO$—	cyanacetate
cyanic	CNO—	cyanate
elaidic	$C_{14}H_{29}CH\ CHCH_2COO$—	elaidinate
ferricyanic	$Fe(CN)_6\equiv$	ferricyanide
ferrocyanic	$Fe(CN)_6\equiv$	ferrocyanide
fluosilicic	$SiF_6=$	fluosilicate

COMMON ACIDS, RADICALS AND SALTS—(*Continued*)

Acid	*Radical or ion*	*Salt*
formic	$HCOO-$	formate
fumaric	$-OOCCH\ CHCOO-$	fumarate
gallic	$C_6H_2(OH)_3COO-$	gallate
glutaric	$-OOC(CH_2)_3COO-$	glutarate
glycollic	$HOCH_2COO-$	glycolate
hippuric	$PhCONHCH_2COO-$	hippurate
hydrobromic	$Br-$	bromide
hydrochloric	$Cl-$	chloride
hydrocyanic	$CN-$	cyanide
hydrofluoric	$F-$	fluoride
hydroiodic	$I-$	iodide
hypochloric	$ClO-$	hypochlorite
iodic	IO_3-	iodate
iodous	IO_2-	iodite
lactic	$MeCH(OH)COO-$	lactate
levulinic	$MeCO(CH_2)_2COO-$	levulinate
lauric	$C_{11}H_{23}COO-$	laurate
maleic	$-OOCCH\ CHCOO-$	maleate
malic	$-OOCCH_2CHOHCOO-$	malate
malonic	$-OOC\ CH_2\ COO-$	malonate
mellitic	$C_6(COO)_6\equiv$	mellitate
molybdic	$MoO_4=$	molybdate
nitric	NO_3-	nitrate
nitrous	NO_2-	nitrite
oleic	$C_{17}H_{33}COO-$	oleate
oxalic	$-OOC\ COO-$	oxalate
	$HOOC\ COO-$	bioxalate
oxaminic	$NH_2COCOO-$	oxaminate
oxybenzoic	HOC_6H_4COO-	oxybenzoate
palmitic	$C_{15}H_{31}COO-$	palmitate
perchloric	ClO_4-	perchlorate
periodic	IO_4-	periodate
phosphoric	$PO_4\equiv$	ortho-phosphate (triphosphate)
	PO_3-	meta-phosphate
	$P_2O_7=$	pyro-phosphate
	H_2PO_4-	acid phosphate
	$HPO_4=$	phosphate
	$P_2O_7\equiv$	pyrophosphate
phosphorous	$PO_3\equiv$	ortho-phosphite
	PO_2-	meta-phosphite
	$P_2O_5\equiv$	pyro-phosphite
phthalic	$C_6H_4(COO)_2=$	phthalate
picric	Same as trinitrophenol	
propionic	C_2H_5COO-	propionate
pyrogallic	Same as trihydroxybenzene	
pyruvic	$MeCO\ COO-$	pyruvate
salicylic	HOC_6H_4COO-	salicylate
selenic	$SeO_4=$	selenate
selenious	$SeO_3=$	selenite
silicic	$SiO_4\equiv$	ortho-silicate
	$SiO_3=$	meta-silicate
stearic	$C_{17}H_{35}COO-$	stearate
suberic	$C_6H_{12}(COO)_2=$	suberate
succinic	$-OOC\ CH_2CH_2\ COO-$	succinate
sulfonic acid	$-SO_2OH$	(see sulfonic acids)
sulfanilic	$NH_2C_6H_4SO_3-$	sulfanilate
sulfuric	$SO_4=$	sulfate
	HSO_4-	bisulfate
sulfurous	$SO_3=$	sulfite
	HSO_3-	bisulfite
tannic	$C_{14}H_9O_9-$	tannate
tartaric	$(CHOH)_2-(COO)_2=$	tartrate
	$C_2H_3(OH)_2COOH\ COO-$	bitartrate
	$-OOC\ CHMe\ CH_2\ COO-$	pyrotartrate
tartronic	$-OOC\ CHOH\ COO-$	tartronate
telluric	$TeO_6\equiv$ and $TeO_4=$	tellurate
tellurous	$TeO_3=$	tellurite
thioacetic	$MeCOS-$	thioacetate
thiocyanic	$SCN-$	thiocyanate
titanic	$TiO_3=$	titanate
toluylic	$C_6H_4MeCOO-$	toluylate
tungstic	$W_2O_7=$ or $WO_4=$	tungstate
wolframic	Same as tungstic	

radical **oxygen-** Oxy a (inorganic) **oxyhalogen-** An a containing oxygen and a halogen, as, $HClO_3$ **para-** An organic a derived from aromatic hydrocarbons and containing the radicals in the para-position **pentatomic-** An a containing five hydrogen atoms which can be replaced by metals or basic radicals **pentabasic-** Pentatomic **phenol-** Phenol acids **plant-** Those derived from vegetable sources **polyatomic-** An a containing more than one hydrogen atom which can be replaced by metals or basic radicals **polybasic-** Polyatomic **pseudo-** (1) A tautomeric form of an organic a (2) An a containing hydroxyl radicals



true a pseudo a

pyro- An acid derived by the action of heat, usually an intermediate compound between acids and acid anhydrides **racemic-** An organic acid consisting of a molecular mixture of optically active dextro- and levo- compounds Cf *tartaric acid* **resin-** Acids derived from resins, *q v* **soldering-** Hydrochloric a of varying strength used for soldering **Spekker-** A mixture of equal volumes of sulphuric acid (d 1 84) and phosphoric acid (d 1 75) used to dissolve iron alloys in preparation for analysis, particularly with the Spekker photoelectric absorptiometer **sulfinic-** An acidic organic compound in which an H atom is replaced by the SO_2H group They are named from the hydrocarbon, as, ethanesulfinic acid*, $EtSO_2H$ **sulfo-** An organic acid in which sulfur replaces the carbon atom of the carboxyl group Cf *thioacids* **sulfonic-** An acidic organic compound in which a H atom is replaced by the SO_2OH group They are named from the hydrocarbon, as, ethanesulfonic acid*, $EtSO_2H$ **tetrabasic-** Tetratomic **tetrahydric-** Tetratomic **tetrahydroxy-** An organic acid containing four hydroxy groups and one or more carboxyl groups **tetratomic-** An acid containing four hydrogen atoms which can be replaced by a metal or basic radical **thio-** An acid in which one or more sulfur atoms replaces the oxygen of the acid radical, *e g* , thiosulfuric, thiolic, thionic acid, etc Cf *sulfo-acids*

a of air Carbon dioxide **a albuminate** A metaprotein soluble in weak alkali **a of amber** Succinic acid **a amide** An organic compound containing the monovalent formamyl radical, $—CONH_2$ Cf *a imide* **a anhydride** An acid from which one or more molecules of water have been removed, *e g* , SO_3 is the anhydride of H_2SO_4, MeCO O OCMe is the anhydride of MeCOOH **a of ants** Formic acid **a of apples** Malic acid **a of benzoin** Benzoic acid **a bordeaux** Bordeaux B **a brown** Naphthylamine brown **a capacity** The number of OH^- ions which a molecule of a base yields in an aqueous solution, thus, NaOH is monoacid, $Ca(OH)_2$ is diacid and, hence, have an **a capacity** of one, two, respectively **a chloride** A compound containing the monovalent —COCl radical, *e g* , acetyl chloride, MeCOCl **a dyes** Any coloring matter for wool or silk which acts as a base and is used as a dye in an acid bath **a egg** An earthenware jar used for storing acids **a. esters** The derivatives of polyvalent organic acids in which some of the acid hydrogen atoms are and some are not replaced by a radical (R), hence, compounds that contain both the COOH and COOR groups **a fuchsin** Acid magenta II, acid rosein The di- and tri-sulfonic acids of rosaniline and pararosaniline which are used as a stain and indicator **a function** Hydrogen ion **a group** The monovalent carboxyl radical, —COOH, which is present in all organic acids **a halide** An organic compound containing the monovalent —COX radical in which X is a halogen (Cl, Br, I, or F), as,

acid bromides, R-oyl bromide*	R—COBr
acid chlorides, R-oyl chloride*	R—COC
acid fluorides, R-oyl fluoride*	R—COF
acid iodides, R-oyl iodide*	R—COI

a hydrazide An organic compound containing the monovalent $--CONHNH_2$ radical, as, acethydrazide $MeCONHNH_2$ **a hydrogen** The hydrogen of the —COOH group in organic compounds which can be replaced by metals, alkyls, aryls or basic radicals **a ions** A negatively charged atom (*e g* , Cl^-) or radical (*e g* , SO_4^{--}) See the table of acid radicals **a amide** A compound containing the —C-(NH)OH radical Cf *a amide* **a infraprotein** An acid metaprotein **a of lemon** Citric acid **a of milk** Lactic acid **a mordant dyes** An acid dye requiring a mordant for its fixation upon fibres **a number** A measure of free fatty acids in animal and vegetable fats It is the number of mg KOH necessary to neutralize the free fatty acids in one gram of fat **a nitriles** Nitriles **a peroxides** An organic compound containing the bivalent —CO O—O CO— radical, *e g* , acetyl peroxide $(C_2H_3O)_2O_2$ Cf *a anhydride* **a proof material** Any substance resisting the corroding effect of a , as, stoneware or certain alloys **a proof stain** See *table* top impregnation **a pump** A pressure pump used for drawing a or ammonia from carboys **a radicals** (1) A mono- or polyvalent radical derived from a mono- or polyvalent a by subtracting one or more hydrogen atoms See the table (*2*) In organic chemistry the acyl radical is sometimes known as the acid radical and has the suffix carbonyl or -oyl, as benzoyl, PhCO— **a rock** A rock containing more than 60 % Si **a salt** A compound derived from a and bases in which only a part of the hydrogen of the a is replaced by a basic radical, *e g* , an acid sulfate $NaHSO_4$ or an acid carbonate, $NaHCO_3$ They are usually designated with the prefix, bi-, *e g* , bisulfate, bicarbonate, etc **a solution** An aqueous solution containing more hydrogen ions than hydroxyl ions (see *hydrogen-ion concentration*) **a of sugar** Oxalic acid **a sulfate** Bisulfate, disulfate An inorganic compound containing the monovalent $—HSO_4$ radical derived from sulfuric acid **a value** (1) Acidity expressed in terms of normality (*2*) A number

acidamide An organic compound containing the radical $—CONH_2$ Cf *acid imide*

acidation (1) Acidylation Conversion into an acid (2) Acidification, or making a solution acidic

acidify To add an acid to a solution until the pH value exceeds 7 0

acidimeter Obsolete term for hydrometer

acidimetry The titration of an acid with a standard alkali solution (see *quantitative analysis*)

acidity (1) Sourness See *taste* (2) An excess of hydrogen ions in aqueous solution, which is measured in two ways (*a*) the intensity of action (=*degree* of acidity) expressed as pH value (where 10^{-7} gm H^+ per liter is neutral) and (*b*) the amount of action (=*amount* of acidity) expressed as normality (gram-equivalent per liter) Antonym Alkalinity (3) The power of a base to unite with one or more equivalents of an acid Antonym Basicity **amount of-** The normality or percentage of an acid as determined by titration (effective acid) **degree of-** The strength of an acid expressed by its hydrogen ion concentration (free acid) Cf pH

acidol $C_5H_{11}O_2N$ HCl = 153 6 Betaine hydrochloride Colorless crystals, soluble in water It is used as substitute for HCl in digestive disturbances

acids See the tables

acme burner A bunsen burner with regulators for gas and air, constructed so that the flame cannot strike-back

acmite $NaFeSi_2O_6$ Aegirite A rock-forming monoclinic pyroxene, d 3 53, hardness 6–6 5, Mol Vol 65 5, which occurs as a brownish, greenish or black *silica* mineral, *q v*

acne bacillus vaccine A vaccine containing the acne bacillus, used in the treatment of mild forms of acne

acocantherin A crystalline glucoside from *Acocanthera abyssinica* It is the active principle of the shashi arrow poison used by the natives of Eastern Africa, and is supposed to be identical with ouabain

acoin Di-p-anisyl-phenetyl-guanidin-chlorhydrate A white crystalline powder, m 176, soluble in water Used as a local anesthetic

acolytine Lyaconine An alkaloid of *Aconitum*

R COOH

$C_nH_{2n+1}COOH$	fatty acids
$C_nH_{2n-1}COOH$	acrylic acids, alicyclic acids
$C_nH_{2n-3}COOH$	acetylene acids, fatty acids (C)
$C_nH_{2n-7}COOH$	aromatic acids (1)
$R(COOH)_2$	
$C_nH_{2n}(COOH)_2$	oxalic acids
$C_nH_{2n-2}(COOH)_2$	fumaric acids
$C_nH_{2n-4}(COOH)_2$	acetylenedicarboxylic acids
$C_nH_{2n-8}(COOH)_2$	aromatic acids (2)
HO R COOH	alcohol acids, phenol acids
R(CO)COOH	ketone acids
NH_2 R COOH	amino acids
R SO_3H	sulfonic acids
$H_xS_yO_z$	sulfuric acids
R COSH	thiocarbonic acids

acidulation Acidation

acidulate Acidify

acidulin A brand of glutamic acid hydrochloride

acidum The Latin for acid, *e g*, **a aceticum.** See *acetic acid,* **a benzoicum** See *benzoic acid,* etc

acidylate Acylate The introduction of an acid radical into an organic compound, as, *acetylate, benzoylate*

acidylation Acylation The process of introducing an acid radical into an organic compound, *e g*, acetylation (acetyl radical), benzoylation (benzoyl radical), formylation (formyl radical), etc

acieral An aluminum alloy containing 3–6 % Cu, 0 1–1 4 % Fe, 0–1 5 % Mn, 0 5 %–0 9 % Mg and 0–0 4 % Si Cf *aerometal*

acinitro compound A colored isomer of a nitro compound which contains a monovalent —OR and monovalent —NO group They are derived from nitro-compounds by a metatenomeric change

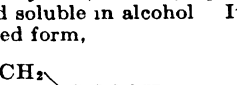
acitrin $C_{18}H_{15}O_2N$ = 277 1 2-Phenylcinchonic acid ethyl ester, ethyl phenylcinchonate A pale yellow, crystalline powder, odorless, tasteless, m 61, soluble in water or alcohol Used medicinally in gout and rheumatism

acivinil alcohols Unsaturated *ketols*

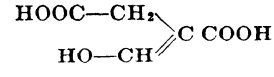
Acker process The manufacture of sodium hydroxide by electrolysis of molten salt using molten lead as cathode and steam as reagent

Ackermann automatic reckoner A calculating device consisting of two circular disks with scales and pointer, used for determining the dry substance of milk from its specific gravity and fat content

aconic acid $C_5H_4O_4$ = 128 06 Formylsuccinic acid lactone, *4 5*-dihydro-5-keto-3-furan carboxylic acid

The monobasic acid, 

Colorless, triclinic crystals, m 164, sparingly soluble in water and soluble in alcohol It also exists in the hydrated form,



aconine $C_{26}H_{21}NO_{11}$ = 523 17 An amorphous alkaloid from the root of aconite **acetylbenzoyl-** Aconitine **pseudo-** Pseudaconine

aconite Aconitum, monkshood, wolf's bane, blue rocket, friar's cowl The ranunculaceous plant *Aconitum napellus*, whose root and leaves are used medicinally as a fluid extract **a alkaloids** A number of alkaloids occurring in *Aconitum* species, *e g*,

aconine	$C_{26}H_{21}O_{11}N$
lycoctonine	$C_{27}H_{41}O_9N$
indaconine	$C_{27}H_{47}O_9N$
neopelline	$C_{32}H_{45}O_8N$
pyraconitine	$C_{32}H_{41}O_9N$
lappaconitine	$C_{32}H_{42}O_9N_2$
aconitine	$C_{34}H_{47}O_{11}N$
japaconitine	$C_{34}H_{49}O_{11}N$
indaconitine	$C_{34}H_{47}O_{10}N$
cynoctonine	$C_{36}H_{34}O_{13}N_2$
pseudaconitine	$C_{36}H_{51}O_{12}N$
bikhaconitine	$C_{36}H_{51}O_{11}N$
jesaconitine	$C_{40}H_{51}O_{12}N$

a leaves The dried leaves of *A napellus*, used similarly to a *root* **a root** The dried tuberous roots of aconite, containing not less than 0 5 % alkaloids Used as an antineuralgic, sudorific and sedative

aconitic acid $C_6H_6O_6$ = 174 1 Citridic acid, equisetic acid, 1-trans-tricarballylic acid, achilleic acid, adonic acid, 1 2 3-propene tricarboxylic acid* The tribasic acid COOH CH_2 C(COOH) CH COOH Colorless crystalline leaflets, m 190, obtained from *Aconitum*, *Equisetum* (horsetail), *Adonis* and *Achillea* species, or made from citric acid It occurs also in beets and sugar cane

aconitine $C_{34}H_{47}O_{11}N$ = 645 4 Acetyl-benzoyl-aconine An extremely poisonous alkaloid from the root of *Aconitum napellus* Colorless, rhombic prisms, or an amorphous powder, m 195, slightly soluble in water, readily soluble in alcohol or ether Used as a circulatory sedative Cf *benzaconine*, *aconite alkaloids* **pseudo-** Pseudaconitine **a arsenate** Colorless crystals, soluble in water or alcohol **a hydrobromide** $C_{34}H_{47}O_{11}N$ HBr $2\frac{1}{2}H_2O$ = 771 5 Colorless crystals, m 163, soluble in water or alcohol Used as a cardiac, respiratory or spinal sedative, vasodilator, diuretic, antipyretic and diaphoretic **a hydrochloride** $C_{34}H_{47}O_{11}N$ HCl $3H_2O$ = 736 1 Colorless l-rotatory crystals, soluble in water or alcohol and used as the hydrobromide **a nitrate** $C_{34}H_{47}O_{11}N$ HNO_3 $5H_2O$ = 798 65 Colorless, l-rotatory crystals, which are soluble in water or alcohol Used instead of the hydrobromide for hypodermic medication **a phosphate** $C_{34}H_{47}O_{11}N$ H_3PO_4 = 743 4 A white crystalline powder which is soluble in water or alcohol **a salicylate** $C_{34}H_{47}O_{11}N$ $C_7H_6O_3$ = 783 5 White crystals, soluble in water or alcohol **a sulfate** $(C_{34}H_{47}O_{11}N)_2$ H_2SO_4 = 1389 02 Colorless l-rotatory crystals, soluble in water or alcohol

Aconitum A genus of poisonous plants of the Ranunculaceae family See *aconite*

aconityl phenetidine Apolysin

acopyrin Acetopyrin

acoretin A neutral resin obtained by the oxidation of the aqueous extract of sweet flag root, *Acorus calamus*

acorin $C_{36}H_{60}O_6$ = 588 6 A glucoside from calamus, the rhizome of *Acorus calamus* (sweet flag), (Araceae), used in perfumery

acorn The fruit of the oak, *Quercus robur*, used as astringent in diarrhea **a flour** Racahout **a sugar** Quercitol **a tube** A small thermionic valve

acoustics A branch of science dealing with sound, and its effects

acqua The Italian word for water

acquired immunity The resistance of an organism resulting from an attack by an infectious disease It can also be artificially produced by treatment with a vaccine, serum, etc

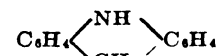
acraldehyde Acrolein

acre A surface measure, 1 acre = 0 4047 hectare = 4 rods = 160 poles = $\frac{1}{640}$ sq mile

Acree-Rosenheim reaction A test for proteins and tryptophane When the solution plus dilute formaldehyde is layered on concentrated sulfuric acid, a purple ring indicates proteins

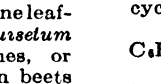
acrid Pungent, bitter, burning or irritating, as, a drug, or sensation

acridan $C_{13}H_{11}N$ = 181 15 5,10-dihydroacridine The compound



acridic acid $C_{11}H_7O_4N$ = 217 0 Acridinic acid α,β- or 2 3-quinoline dicarboxylic acid, C_9H_5N-$(COOH)_2$ Colorless crystals which decompose at 130 It is an oxidation product of acridine

acridine $C_{13}H_9N$ = 179 15 A tricyclic, heterocyclic hydrocarbon obtained from coal tar



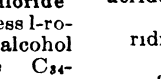
Colorless leaflets, m 109, b 346, soluble in water or alcohol Used in the synthesis of dyes and drugs and the treatment of trypanosomiasis Cf *benzacridine*, *naphthacridine*, *chrysaniline*, *rivanol* **diamino-sulfate** Proflavine **diamino- -chloride** Acriflavine **diaminodimethyl-** A yellow dyestuff **dihydro-** Acridan **dihydroketo-** Acridone **diphenanth-** Diphenanthacridine

a -dye Any dyestuff derived from acridine, as, *acriflavine* They are characterized by fluorescent solutions

acridinic acid Acridic acid

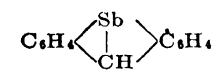
acridol An oxidation product of acridine, probably acridine-10-oxide

acridone $C_{13}H_9ON$ = 195 08 Ketodihydroacridine,



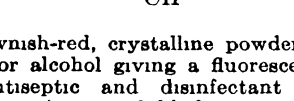
Colorless crystals, m 354, insoluble in water and slightly soluble in alcohol or ether

acridostibine $C_{13}H_9Sb$ = 286 92 The heterocyclic hydrocarbon,



acridyl The monovalent radical $C_{13}H_8N$—, derived from acridine

acriflavine $C_{14}H_{14}N_3Cl$ = 261 8 4 8-diamino-1-methylacridine chloride, trypaflavine



A brownish-red, crystalline powder, soluble in water or alcohol giving a fluorescent solution An antiseptic and disinfectant **a hydrochloride** A more soluble form containing 1 mol HCl **a neutral** The less soluble form, without HCl

acrimonious Bitter, caustic, sharp, as, a taste

acrinyl p-hydroxybenzyl The monovalent C_7H_7O— radical (HO C_6H_4 CH_2—) **a isothiocyanate** C_8H_7ONS = 165 1 The compound, C_7H_7O NCS, which occurs in white mustard oil and is a splitproduct of sinalbin **a sulfocyanate** C_7H_7O CNS = 165 13 An oily, colorless liquid found in white mustard oil, which is insoluble in water

Acrocomia. The coyol palm of Central and South America An oil is extracted from the nuts

acro-dextrin Achroodextrin

acrol The divalent CH_2 CH CH= radical derived from acrolein, (cf *acryl*)

acrolactic acid Glucic acid

acroleic acid Acrylic acid

acrolein C_3H_4O = 56 05 Acrylic aldehyde, propenal*, allyl aldehyde, ethylene aldehyde, CH_2 CH CHO A decomposition product of

glycerol and glycerides A yellow or colorless liquid with pungent odor, d 0 84, b 52 4, soluble in water, alcohol or ether Used in chemical warfare as an irritant, and also in organic synthesis Inflammable Cf *acrol, acryl* **dimethyl-** Tiglaldehyde **furfur-** *Furfuracrolein* **met-** See *metacrolein* **methyl-** Crotonaldehyde **2-naphthyl-** $C_{13}H_{10}O$ = 182 1 Pale yellow needles, m 48, b $_{4mm}$160–170 **phenyl-** Cinnamaldehyde

acrolite A synthetic resin from phenol and glycerol

acromelin $C_{17}H_{16}O_9$ = 364 12 A lactone obtained from *Physcia acromela*

acrometer A hydrometer for determining the specific gravity of oils

acronarcotic A drug which is acrid and narcotic, as, aconite, sanguinaria or veratrum

acronol A trade name for basic dyestuffs

acropeptides Complex amino acids produced by the action of hot glycerol on gelatin

acrose $C_6H_{12}O_6$ = 180 09 A synthetic carbohydrate obtained by the action of dilute NaOH on glycerose **α-** Same as *l*-fructose

acrosite Pyrargyrite

acryl The organic, monovalent radical C_3H_3O— derived from acrolein **alpha-** The monovalent radical CH_2 C(CHO)— **beta-** A monovalent radical occurring in two isomeric forms

HC CHO	HC CHO
‖	‖
HC—	—CH
cis-	trans-

acrylaldehyde Acrolein

acrylate A salt of acrylic acid containing the monovalent $C_3H_3O_2$- radical

acrylic acid $C_3H_4O_2$ = 72 05 Acroleic acid, propenoic acid*, propene acid, ethylenecarboxylic acid, CH_2 CH COOH An oxidation product of acrolein A colorless liquid with pungent odor, m 10, b 140, d $_{16}$ = 1 062, soluble in water **α,β-dimethyl-** See *angelic* and *tiglic* acid **β,β-dimethyl-** Senecioic acid **β-ethyl-** α-Pentenic acid **α-hydroxy-** Pyruvic acid **imidoazole-** Urocanic acid **α-methyl-** CH_2 - CMe COOH = 80 046 Methacrylic acid An isomer of butenic acid, d 1 015, m 16, b 160 5 **β-methyl-** See *crotonic* and *isocrotonic acid* **α-phenyl-** Atropic acid **β-phenyl-** Cinnamic acid **propyl-** Hexenoic acid*

a acids Olefine acids A series of unsaturated aliphatic acids of the general formula, $C_nH_{2n-2}O_2$, as

acrylic acid	C_2H_3 COOH
butenic acids	C_3H_5 COOH
(crotonic, isocrotonic, vinylacetic and methylacrylic acid)	
pentenic acids	C_4H_7 COOH
(tiglic, angelic and senecioic acid)	
hexenic acids	C_5H_9 COOH
teracrylic acid	C_6H_{11} COOH
hypogeic acid	$C_{15}H_{29}$ COOH
oleic, elaidic acid	$C_{17}H_{33}$ COOH
erucic, brassidic and behenic acid	$C_{21}H_{41}$ COOH

a. aldehyde Acrolein

acrylonitrile Vinylcyanide

acrylophenone C_9H_8O = 132 06 Phenylvinyl ketone, CH_2 CH COPh An isomer of cinnamaldehyde * **β-phenyl-** Chalcone

acrylyl The monovalent radical CH_2 CH CO—, derived from acrylic acid

Actæa. A genus of ranunculaceous herbs

A alba	white cohosh
A cimicifuga	Black Snake root
A rubra	red cohosh

acterol An irradiated *ergosterol*, q v , 1 cc = vitamin D of 100 cc cod liver oil

actiniasterol A sterol, m 145, from sea anemone, *Anemonia sulcata*

actinic Pertaining to radiations, especially light that produces a chemical change **a rays** Those rays of the spectrum which produce chemical changes, they occur in the violet and ultra violet regions Cf , *irradiation, activation, ultraviolet, quantum efficiency*

actinine $C_{13}H_{24}O_5N_2$ = 288 3 An alkaloid from *Actinea equina*

actinism The study of chemical changes produced by radiations Cf *photochemistry, irradiation, excitation, activation*

actinium Ac = 227 A radioactive element, atomic number 89 It was discovered in 1899 by DeBierne in pitchblende, and is identical with the anemium of Giesel (1902) It is trivalent, an isotope of mesothorium 2, and the predecessor of the actinium series See *radioactive substances* **a emanation** Actinon **a series** A series of radioactive disintegration products derived from uranium 2

actinodaphnine $C_{19}H_{19}NO_4$ = 325 15 An alkaloid from *Actinodaphne* species, Lauraceae, resembling laurotetanine, *q v* Cf *bulbocapnine*

actinolite A green, rock-forming calcium, magnesium and iron amphibole resembling tremolite, $Ca(MgFe)(SiO_4)_2$, d 3–3 5, its fibrous variety is asbestos

actinometer (1) A screen which fluoresces under the influence of radioactive rays and is used as a photometer (2) A device for measuring the power of actinic rays Cf *uroxameter*

actinon An = 222 Actinium emanation, Act-Em, an isotope of niton, Nt, atomic number 86 It is the gaseous disintegration product of actinium Cf *radioactive series*

actinouranium An isotope of uranium and a primary radio-element of At No 92 Cf *radioactive series*

actinozoa A class of animals of the phylum Coelenterata, or jelly-fishes, which are characterized by star-like structures

action The physical concept of activity or work performed in unit time, hence *action = energy* × *time* or *momentum* × *distance*, hence, a = mv^2t = mvs, where m is the mass, v the velocity, t the time and s the distance traversed **chemical-** Any reaction, q v , or a change in which the atoms of a molecule or molecules are rearranged **electronic-** The change of an electron from one to another energy level, q v Cf *excitation* **physical-** Any transformation of matter which does not affect molecular structure

activated Rendered active, reactive, or excited **a atom** See *atom* **a carbon** Charcoal produced by the destructive distillation of vegetable matter, as, wood, rice-hulls, nut-shells, etc , with or without the addition of chemicals It is used in powdered form for decolorizing sugar solutions, oils, fats, etc , or in granular form as an adsorbent in gas-masks and for the recovery of solvent vapors Cf *norit, boneblack, revivification* **a molecule** A molecule with one or more excited atoms Cf *irradiation, excitation* **a sludge** The oxidized and flocculent sediment of sewage which contains different types of bacteria **a s process** A method of sewage disposal in which the sewage is agitated in contact with air, causing thereby oxidation and flocculation by bacterial action, it is left to settle in separation tanks, and yields a harmless and clear effluent

activation (1) Any method by which a metallic catalyst is rendered active or is regenerated, as, heating platinum sponge Cf *revivification* (2) The transformation of an inactive enzyme (zymogen) into an active enzyme by a third substance (kinase), *e g* , pepsinogen (the *zymogen*) is transformed by HCl (the *kinase*) into pepsin (the *active enzyme*) (3) Excitation (4) Irradiation (5) A of carbon, *e g* , by heating with chlorine, steam, carbon dioxide, or sulfuric acid

activator (1) A catalyst (2) A substance used in flotation to produce a coating having metallic properties, as, sodium sulfide for lead carbonate ores, or copper sulfate for sphalerite

activatory See *phase*

active (1) Dynamic or working, as opposed to static or inert (2) Having optical properties, as an asymmetric carbon atom Cf *optical activity* **a deposit** The formation of a radioactive layer on a substance which is exposed to the emanation of radio-elements **a immunity** The stimulation of an organism which produces protective substances against infection by bacteria **a immunization.** The processes by which the protective agencies of an organism are caused to resist a bacterial invasion **a. mass** The number of moles (gram-molecules) in a unit volume (1 liter) **a oxygen test** A test for rancidity in fats, by the liberation of iodine from potassium iodide in acetic acid **a principle** The substance which is the cause of the physiological action of a drug *e g* , an alkaloid, glucoside, or essential oil

activin An organic iodine compound of casein used medicinally

activity (1) The rate at which an agent works Compare *action* It is measured in watts (2) The ratio of the escaping tendency (*fugacity*) of two phases at the same temperature $a = f_1/f_1^\circ = p_1/p_1^\circ$, one phase taken as standard A correction applied to the actual concentration (c) of a strong electrolyte, which enables it to satisfy Ostwald's dilution law (q v) (3) A measure of interionic forces Cf *a coefficient* **a of activated carbon** The percentage of carbon disulfide vapor absorbed by carbon (generally 50 %) **amylolytic-** The digestive power of amylase **enzyme-** The rate at which an enzyme works **excited-** Active deposit **ionic-** Thermodynamic concentration In a dilute solution which obeys the gas laws, the i a equals the concentration, in other solutions it is that value, which with the fugacity (q v), ensures that the gas laws still hold **optical-** The capacity of a substance to rotate the plane of polarized light This depends on the presence of, at least, one asymmetric carbon atom in the structure of the compound **peptic-** The digestive power of pepsin **radio-** See *radioactivity* **tryptic-** Digestive power of trypsin **a coefficient** The ratio, a/c, see activity (2)

actol Silver lactate

acton Ethyl orthoformate

actor A compound which takes part in both primary and secondary reactions See *induced reactions*

acute Quick, short or sharp Cf *chronic* **a poisoning** See under *poisoning*

acyclic The structure of organic compounds which contain no ring-system, as in the methane series Synonym Aliphatic or chains Antonym Cyclic, aromatic or rings

acyl An organic radical derived from an organic acid by the removal of the hydroxyl group, hence, R CO—is the a radical of R CO OH, $R SO_2$—is the a radical of $R SO_2 OH$ It is also known as the acid radical See *acetyl, benzenesulfonyl, benzoyl*, etc **a derivatives.** Any organic compound containing an a radical, such as amides, R CO NH_2, *acyl* chlorides, R CO Cl **a radical** Acyl

acylation Acidylation The formation or introduction of an acyl radical in or into an organic compound

acyloin An organic compound of the type R CO - CHOH R, formed by condensation of aldehydes, which readily oxidizes to diketones, as, Ph CO - CHOH Ph, benzoin

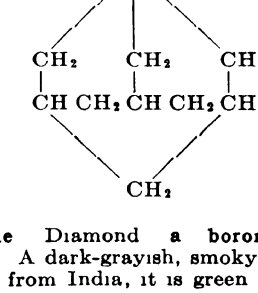
aczol An ammoniacal solution of zinc and copper phenolates used as a wood preservative

adaline $C_7H_{13}O_2N_2Br = 237\ 1$ Carbromal, bromodiethyl-acetyl-carbamide, α-bromo-α-ethyl-butyryl urea, $Et_2CBr\ CO\ NH\ CO\ NH_2$ A white, odorless, crystalline powder, m 116°, slightly soluble in water and soluble in alcohol Used medicinally as a hypnotic and sedative

Adam galactometer A graduated burette with two glass bulbs, used in milk analysis

adamant A hard mineral or substance, as, diamond

adamantane $C_{10}H_{16} = 136\ 2$ Tricyclodecane The hydrocarbon



adamantine Diamond **a boron** See *boron* **a spar** A dark-grayish, smoky variety of corundum from India, it is green in transmitted light

adamellose An igneous rock of the andesite-diorite series, containing hornblende, feldspar, quartz, chlorite, agnetite, apatite, and rutile It is found at Pigeon Point, Minnesota

Adami's theory The lateral chain theory of heredity expressed in terms of biophoric molecules

adamine Adamite

adamite Zn_2HAsO_5 Adamine A native zinc arsenate, which occurs in yellow orthorhombic crystals in Chile, Greece, France

Adamkiewicz reaction A test for proteins made by layering on glacial acetic acid and concentrated sulfuric acid, proteins give a violet ring

adamon Dibromo-dihydro-cinnamic acid ester of borneol Used medicinally as a sedative and anaphrodisiac

Adam's apple (1) The fruit of the plantain tree, *Musa paradisiaca* (2) The projection of the thyroid cartilage of the larynx **A's needle** Yucca

adamsite (1) A greenish-black variety of mica (2) Diphenylamine chlorarsine

Adansonia A genus of trees of the Bombacaceae *Adansonia digitata*, the baobab tree of Africa, yields bou or monkey bread which is used by natives as food The bark is used as emollient, the dried leaves, lalo, are used by the natives as an antipyretic, the fibers are used for paper

adansonine An alkaloid from the bark and leaves of *Adansonia baobab* or *A digitata* of Africa and India Colorless white crystals, used medicinally as a febrifuge

adaptation The advantageous adjustment of an organisms to a change in its surrounding

adapter A tapered glass tube which is used to connect a retort or condenser with the receiving vessel

adatom An atom adsorbed on a surface in such a way that it will migrate over the surface like a two-dimensional gas (at certain temperature) Cf *adion*

addition A chemical reaction which involves no change of valency, usually the union of two binary molecules to form a more complex compound, as, $HCl + NH_3 = NH_4Cl$ **a compound** An inorganic compound formed by addition, *e g* , NH_4Cl

additive Added to **a compound** An organic compound formed by the saturation of an unsaturated compound containing one or more double or triple bonds *E g* , benzene dichloride, $C_6H_6Cl_2$ is an additive compound of benzene, C_6H_6 It differs from substituted compounds, *e g* dichlorobenzene, $C_6H_4Cl_2$ **a properties** A property of a molecule which is the sum of the individual properties of the atoms or linkages composing it Thus, in absence of molecular association, the molecular refractivity of a molecule is given by the sum of the atomic refractivities of its atoms, due allowance being made for the types of linkage which bind them

adduction Oxidation

adelite $MgCaHAsO_5$ A native calcium magnesium arsenate of the wagnerite group, which occurs in monoclinic gray crystals

adelomorphic cell Any living cell of uncertain or indefinite shape, *e g* , an ameba

adenantherine A crystalline alkaloid resembling physostigmine, obtained from *Adenanthera pavonia*, order *Leguminosae*

adenase A deamidizing enzyme in animal tissues which hydrolyses adenine to hypoxanthine

adenine $C_5H_5N_5$ = 135 12 6-aminopurine A purine base derived from nucleic acid and found in the pancreas, spleen and other glands White needles, m 360, slightly soluble in water or alcohol **a nucleotide** Adenosin triphosphoric acid, adenylpyrophosphoric acid The compound $H_4P_2O_7[(C_5H_4N_5)$-$CH(CHOH)_2CH\underset{\displaystyle O}{\overset{\displaystyle CH_2OPO_3H_2}{|\!-\!|}}]$, the primary constituent of resting muscle

adenoid Resembling a gland or pertaining to glands

adenos A fine quality of cotton from Aden, Asia Minor

adenosin $C_{10}H_{13}N_5O_4$ = 267 1 Adenine riboside A glucoside from nucleic acid consisting of adenine and d-ribose Colorless needles, m 229°, soluble in water **a phosphoric acid** Adenylic acid **a triphosphoric acid** Adenine nucleotide

adenylic acid $C_{10}H_{13}N_5O_4HPO_3$ = 347 18 Adenine-ribose phosphate, adenosin phosphoric acid A nucleotide from red blood corpuscles, muscle, yeast, etc consisting of adenine, ribose and phosphoric acid White needles, m 197 It lowers the blood pressure and intestinal motion Cf *adenine nucleotide, inosinic acid, guanylic acid*

adeps Any animal grease or fat, *e g* , lard **a lanae** Lanolin **a mineralis** Vaselin

adermin The anti-dermatitic vitamin B_6, obtained from yeast extract by dialysis

adfluxion Affluxion

adglutinate Agglutinate

adhatotic acid An organic acid from the leaves of *Adhatoda vasica*, an Acanthaceae Cf *vasicine*

adhere To be attached to or to stick to a different substance Cf *cohere*

adhesion The attraction or force which holds unlike molecules together Cf *cohesion, wetting, adsorption*

adhesive Any substance that sticks or binds materials together, as, adhesive plaster or paste **a meter** An apparatus to determine the relative viscosity of materials, chiefly asphalts and road materials

adiabatic A change occurring without a loss or gain of heat Cf *Reech's theorem* **a calorimeter** An instrument for the study of reactions in which there is a minimum loss of heat, *e g* , *Riehe calorimeter* **a elasticity** The modulus of elasticity of a gas undergoing a change in volume without transference of heat, *e g* , in explosions **a expansion** The expansion of a gas considered without the production of a cooling effect **a processes** Any experiment carried out under such conditions that no heat can leave or enter the system

adiactinic A substance which does not transmit photo-chemically active radiations

adicity Valency

adinole A mineral consisting of metallic silver and albite

adion An adsorbed ion Cf *adatom*

adipaldehyde $C_6H_{10}O_2$ = 114 08 Hexanedial*, adipic dialdehyde, $CHO(CH_2)_4CHO$ An oily liquid, b 94

adipamide $C_6H_{12}O_2N_2$ = 144 11 Adipic diamide 1 4-butanedicarboxamide, hexanediamide*, $NH_2CO(CH_2)_4CONH_2$ An isolog of succinamide, m 220

adipic acid $C_6H_{10}O_4$ = 146 11 Adipinic acid, butane dicarboxylic acid, hexanedioic acid* The dibasic acid, $COOH(CH_2)_4COOH$ Colorless or yellowish needles, m 149 b 265, sparingly soluble in water and soluble in alcohol or ether It is formed during the oxidation of C_6H_{12}, or by the treatment of oleic acid and other fats with nitric acid **tetrahydroxy-** See

saccharic acids **a dialdehyde** Adipaldehyde **a diamide** Adipamide **a ketone** Cyclopentanone*

adipinic acid Adipic acid

adipoin $C_6H_{10}O_2$ = 114 08 β-Hydroxy cyclo hexanone White powder, m 91, very slightly soluble in water

adipyl The divalent radical —OC(CH₂)₄CO—, derived from adipic acid **a chloride** $C_6H_8O_2Cl_2$ = 192 98 Hexanedioyl chloride* A colorless liquid, b_{10mm}113

adjacent position Adjoining, near The consecutive arrangement of radicals in an organic ring compound, as, the 1 2- or 1 2 3 -position in the benzene ring (ortho- or adjacent position)

adjective Supplemental or accessory **a dyes** Those dyes which require a mordant, *q v*

adjoining Adjacent

adjuvant An auxiliary drug, which assists the action of another drug

Adler benzidine reaction A sensitive test for blood in urine Cf *benzidine test*

adlumine $C_{21}H_{21}NO_6$ = 383 17 An alkaloid from *Adlumia fungosa*, a Papaveraceae Cf bicuculline

adnephrine Adrenaline

adnic Admiralty nickel An alloy of 70 % Cu, 29 % Ni and 1 % Sn

adobe A soil of arid regions, formed by the disintegration of rocks and deposited in microscopic particles consisting essentially of CaO, SiO_2, CO_2 and Fe_2O_3 Brown, clay-like masses used by the natives of Egypt and New Mexico for buildings, bricks and potteries

adonic acid $C_3H_3(CO_2H)_3$ = 174 2 An acid occurring in *Adonis vernalis* and supposedly identical with aconitic acid

adonidin $C_{24}H_{42}O_9$ = 474 3 A glucoside from *Adonis vernalis* A hygroscopic, canary-yellow powder of intensely bitter taste, soluble in water **or** alcohol, but insoluble in ether or chloroform Used as a heart stimulant and diuretic Cf *picroadonidin*

adonidulcite A carbohydrate of unknown composition from *Adonis vernalis*

adonin $C_{24}H_{40}O_9$ = 472 3 A glucoside from *Adonis vernalis*, used as a heart stimulant and resembling digitalin in its action

adonis False hellebore, pheasant's eye The dried over-ground leaves and stems of *A vernalis*, (Ranunculaceae) of America and Europe Used as a fluid extract as a heart stimulant

adonite $C_5H_{12}O_5$ = 152 12 Adonitol A pentatomic alcohol, obtained from *Adonis vernalis* Colorless needle-like prisms, m 102, soluble in water or alcohol It changes on oxidation to ribose

adonitol Adonite

adrenal gland A small gland above each kidney

adrenalin $C_9H_{13}O_3N$ = 183 1 Adrenaline, adremine, adrine, adrenamine, adnephrine, chelafrin, epirenan, epinephrine, hemisin, hemostatin, paranehrin, suprarenine, suprarenaline, supracapsuline, supranephrane, *l*-methylaminoethanol catechol, o-dioxyphenylethanol-methylamine $C_6H_3(OH)_2CHOH CH_2NHMe$ A light-brown microcrystalline powder, m 205, slightly soluble in water and insoluble in alcohol It combines with acids to form water-soluble compounds and is decomp when heated above 210°C It is obtained from the suprarenal glands of animals and is used for intravenous injections to raise the blood pressure, and as an astringent, hemostatic and heart tonic **d-** Dextro- Is one-fifteenth as active as the l- **i-** Inactive- Is one-half as active as the l- **l-** Levo- The natural or synthetic, physiologically active compound (see above) **a hydrochloride** The epinephrine of the trade which is used as adrenalin **a bitartrate** The suprarenine of the trade

adrenalone $C_9H_{11}O_3N$ = 181 1 Methylaminoacetocatechol The ketone of adrenalin, $C_6H_3(OH)_2CO CH_2NHMe$

adrenine Adrenaline

adsorbate That which is adsorbed

adsorbent A substance that adsorbs, as, carbon, charcoal, clay, silica, etc Cf *absorbent* **crystallogenetic-** A crystalline substance which can be dehydrated without loosing its shape Its structure becomes porous and thus, absorbent, as, chabazite

adsorption The ability of a substance (*adsorbent*) to hold or concentrate gases, liquids or dissolved substances (*adsorbate*) upon its surface, a property due to *adhesion*, *q v* , hence, producing a change of concentration of the adsorbate on the surface of the adsorbent with respect to the interior concentration of the adsorbate Cf *sorption, absorption, desorption, persorption, wetting* **anomal-** a which does not follow the a isotherm, as, with certain colloidal dyes **apolar-** Nonpolar a **co-** a in which two substances are held on a surface, on which neither is adsorbed alone **differential-** See *differential* a **heat of-** The calories liberated during a **negative-** a in which the surface concentration of the adsorbate is lowered because of preferential a of the liquid **nonpolar-** Apolar- a in which nonelectrolytes or equivalent ions of electrolytes are held on a surface **oriented-** a in which the molecules are grouped on the surface in a definite direction Cf *mono*-molecular film **polar-** a in which definite anions or cations are held in nonequivalent amounts **positive-** a in which the surface concentration of the adsorbate is higher **preferential-** Pronounced a of one substance compared with another of similar physical properties, called *chemo-sorption* in extreme cases **specific-** (1) Preferential- (2) The quantity of adsorbate on 1 cm^2 surface **water of-** The water of crystallization of precipitates, which can be driven off below 100°C

a analysis Separation of mixtures by means of the different absorbability of the components Cf *capillary* and *chromatographic analysis* **a catalysis** A chemical reaction in which the adsorbent acts as a catalyst, *q v* **a coefficient** The quantity x of the *a isotherm* **a displacement** The replacement of one adsorbate on a surface by another **a equilibrium** The distribution of molecules on a surface and in the surrounding medium as expressed by the *a isotherm* **a exponent** The quantity 1/n of the a isotherm, its value at constant temperature varies between 1 and 0 1 or less **a isotherm** The approximate, empirical relationship existing between the concentration x, held upon the surface and the amount, c, which is not adsorbed $x/m = \alpha\ c^{1/n}$, where m is the amount of adsorbent and α, 1/n are experimental constants **a potential** The work obtainable when an adsorbate is brought into the *a space* **a space** The zone between the surface of the adsorbent and

the limit of the adsorbent, the limit of the adsorptive layer

adsorptive Adsorbate

adstringent Astringent

adubiri A fish poison obtained from *Paulowilhelmia speciosa*, used by the natives of the Gold Coast

adularia A variety of *orthoclase*

adulterant A substance of cheaper or inferior quality, sometimes harmful, which is added to an article, compound or food

adulteration (1) The fraudulent addition of a foreign substance, especially harmful preservatives, to food products (2) The removal of an essential constituent of a substance, as the skimming of milk

adurol A hydroquinone derivative, used as a photographic developer

advection Heating or cooling effects due to horizontal currents in air or water Cf *convection*

adventitious Not typical or normal, accidental

advitant A proposed name for *vitamin*

Æ- see also under E

aegerite Wurtzite

aegirite Acmite

aenigmatite A triclinic amphibole, consisting of a metasilicate of sodium and ferrous iron, which contains some Ti instead of Si It occurs in black masses of sp gr 3 8

aeolotropic Anisotropic

aeonite Wurtzite

aequum The amount of food which is just sufficient to support an organism doing work

aer Atmos

aerated water A water artificially impregnated with oxygen or carbon dioxide, as, soda water

aerobe An organism that requires an atmosphere of oxygen for respiration Cf *aerobic bacteria, anaerobe*

aerobic bacteria Certain protophyta which require gaseous oxygen for the maintenance of their vitality Cf *anerobic*

aerobioscope A device for determining the number of bacteria in air

aerobiosis Life sustained in an atmosphere containing oxygen

aerodynamics Pneumatics The study of the motion of gases

aerofloat The trade name for flotation agents of the dithiophosphoric acid type

aeroklinoscope An air-cell used to float algae upon water

aerolite Meteoric stone A meteorite consisting of a stony mass of silicates Cf *siderolite*

aerometal An aluminum alloy containing 0 2–4 % Cu, 0 3–1 3 % Fe, 0–0 2 % Mn, 0–3 % Mg, 0–3 % Zn and 0 5–1 0 % Si Cf *acieral*

aerometer An instrument for determining the density of gases

aeron An aluminum alloy containing 1 5–2 0 % Cu, 1 0 % Si and 0 75 % Mn

aeronautics The art and science of flying and navigation in the air

aeroplankton The organisms (pollen, bacteria, etc) carried by air

aerophone An apparatus to amplify sound waves

aeroscope A glass apparatus used to obtain bacteria from air

aerosiderite An iron meteorite Cf *siderite*

aerosite Pyrargyrite

aerosol (1) A colloidal system *q v* with gas as the surrounding medium, as, smokes and fogs (2) A trade name for a powerful wetting agent of the sulphonated bicarboxyacid ester type

aerosphere Atmosphere

aerostatics The branch of physics which deals with gases in mechanical equilibrium Cf *hydrostatics*

aerotherapeutics The treatment of disease by varying the pressure or composition of the atmosphere in which the patient lives

aerotonometer An instrument for determining the pressure of gases in blood

aerotropic Attracted by air, as an organism, organ or cell

ærugo (1) Cupric subacetate (2) The oxide or rust of a metal

æchynite A resinous, black, orthorhombic mineral which consists of the columbates of calcium, iron, cerium, lanthanum, titanium and thorium

æscigenin $C_1H_{50}O_2 = 196\ 2$ A glucoside from the horse chestnut or *Aesculus hippocastanum*

æscinic acid $C_{24}H_{40}O_2 = 360\ 32$ Capsulocsic acid A monobasic acid obtained from the seeds of *Aesculus hippocastanum*, horse chestnut

æscorcin $C_9H_8O_4 = 180\ 1$ Escorcin A split-product of aesculin A brown powder which is soluble in alkalis A 10–20 % aqueous solution is used in ophthalmology for the detection of defects in the cornea

æsculetin, aesculetin Esculetin

æsculetinic acid Esculetinic acid

æsculin, aesculin Esculin

æsculinic acid Esculin

æthan German for ethane

æther (1) The official Latin also German, for *ether*, (q v), formerly also for ester (2) The hypothetical universal medium through which electromagnetic waves (*e g* , light and heat) are propagated

ætherische oel German for essential oil

aethusine A volatile alkaloid from *Aethusa cynapium*, which appears to be identical with conine

æthyl German for ethyl

æthylen Official Latin for ethylene

æthylis Official Latin for ethyl

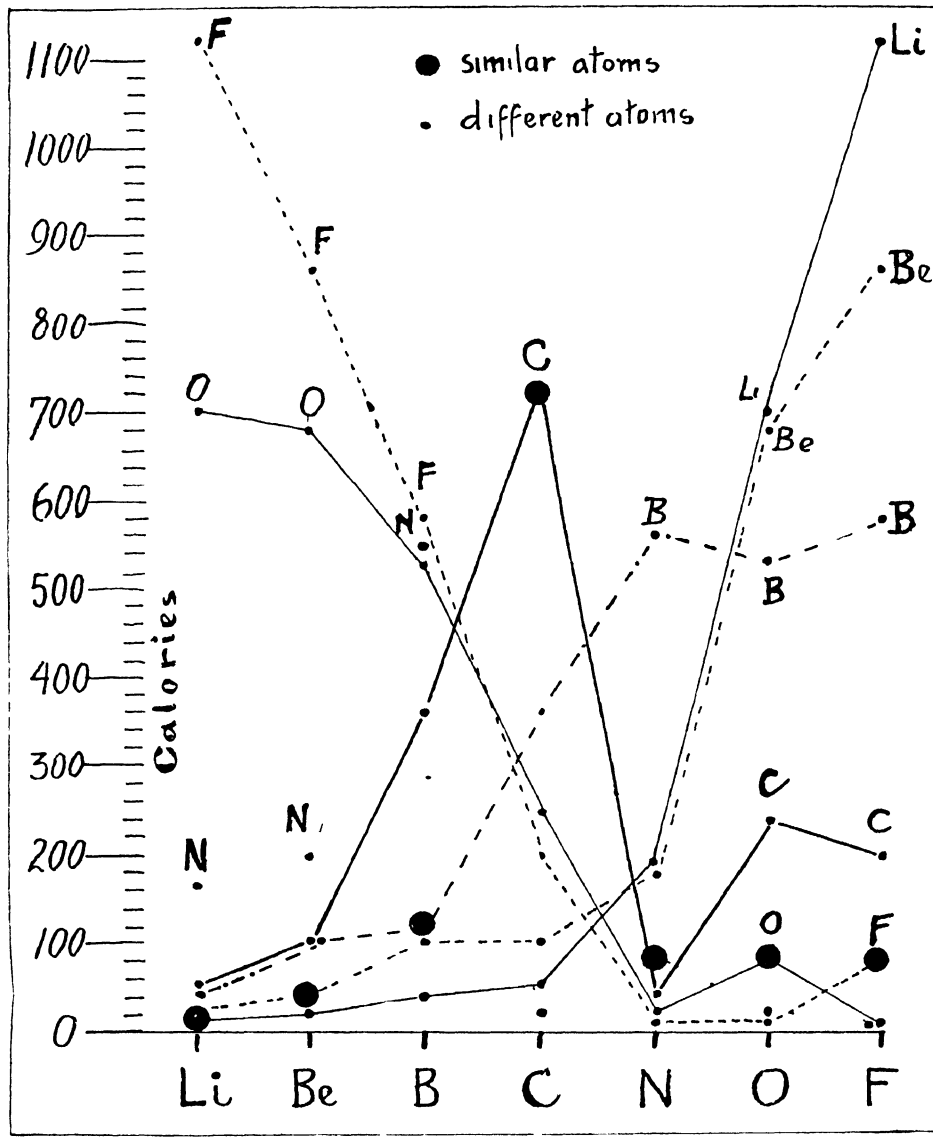
ætioporphyrin $C_{31}H_{36}N_4 = 464\ 5$ A split product of hemoglobin and of chlorophyll

afenil A brand of calcium chloride urea $CaCl_2 \cdot 4(NH_2)_2CO$, used in calcium therapy

affination A centrifugal filtration process in which a large proportion of the molasses contaminating the raw sugars obtained by the initial concentration of sugar liquors are removed from the sugar crystals

affinity The selective tendency of elements to combine with one, rather than another element, when physico-chemical conditions are equal or slightly in favor of the rejected' element It is expressed thermodynamically by the *reaction isotherm* (q v) See *affinity curve* **electro-** See *electro affinity* **electron-** See *electron* **residual-** See *residual bond*

a bond See *bond* **a constant** The ratio, F_a/F_b, where F_a is the intrinsic tendency of substance *a* to decompose and F_b the tendency of substance *b* to combine (see *equilibrium* and *dissociation constant*) **a curve** A graph obtained when the heat of formation is plotted against the types of combining atoms It is an expression of the respective electromotive forces and the affinities In the diagram the first period of the elements is shown The peak



Affinity curve

shown by Li F and F Li is caused mainly by the electromotive force, whereas the peak shown by C C is considered to be due to affinity and thus explains the many carbon compounds

affluxion Adfluxion Flowing or coming together

African kino Kino **A pepper** Capsicum **A saffron** Carthamus

afridol $C_8H_7O_2Hg$ = 351 7 Sodium mercuric hydroxy toluylate, Hg(OH) C_6H_3Me COONa An odorless, tasteless, white powder, used in the treatment of parasitic skin diseases

afsal Urasol

after Behind, following in point of time **a contraction, a expansion** The percentage difference in length of a brick or refractory maintained at high temperature in service In testing the brick is measured before and after being heated to 1410°C for two hours

Ag The symbol for silver (argentum)

agalmatolite Pyrophyllite

agamy Agamogenesis Asexual reproduction, as opposed to gamogenesis or sexual reproduction

agaphite A Persian turquoise

agar-agar Agal-agal, Bengal isinglass, Japanese gelatin, Japanese isinglass The dried mucilaginous substance extracted from marine algae or sea weeds such as, *Gelidium corneum*, *Gracilaria lichenoides* or *Gigartina speciosa* (Class Rhodophyceae) It occurs in bundles of thin, transparent membranes, or yellowish-white shreds which are insoluble in cold water, and slowly swelling and soluble in hot water It is used extensively as a culture medium

in bacteriology, as a glue, and for making silk and paper transparent **glucose-** See *glucose*-agar **glycerin-** See *glycerin*-agar **lactose-** See *lactose*-agar **litmus-** See *litmus*-agar **plain-** A culture medium which consists of 15 gm agar-agar, 10 gm peptone, 5 gm sodium chloride, and 1000 cc of bouillon stock solution, neutralized with sodium hydroxide, and filtered through a heated filter

agar hanging block A small cube of nutrient agar placed over a culture on the surface of a cover-slip glass It is examined under the microscope in the same way as a hanging drop, *i e*, upside down

agaric *Agaricus albus*, touchwood, spunk, tinder The dried fruit body of the fungus, *Polyporus officinalis* a Polyponaceae, which grows on the *Larix* species **fly-** See *Amanita* **surgeon's-** Amadonu **white-** Agaric **a acid** $C_{19}H_{36}(OH)(COOH)_3\ 1\frac{1}{2}H_2O$ = 443 45 Laricic acid, agaricic acid, agaricinum A tribasic acid from agaric An odorless, colorless tasteless, glistening, microcrystalline powder m 140, slightly soluble in water It is supposed to be the active principle of agaric, and is used as a local irritant **a mineral** Rockmilk A soft, white deposit of calcite occurring as microscopic crystals

Agaricaceae The mushrooms or toadstools, which comprise 4600 species of plants, some are poisonous (*Amanita*), others edible (*Agaricus*, *Cantharellus*)

agaricic acid Agaric acid

agaricin An alcoholic extract of white *Agaric* or *Polyporus officinalis* A brownish powder, soluble in water or alcohol and containing impure agaric acid It is used as a purgative and to arrest perspiration

agaricinum Agaric acid

agaricol $C_{10}H_{16}O$ = 152 1 A monoatomic alcohol in white agaric It is a colorless powder, m 223

agarythrine An alkaloid obtained by ether extraction from the fungus *Agaricus rubra* A yellow, bitter substance, which on oxidation yields the red coloring matter of fungi

agate A cryptocrystalline quartz or chalcedony, SiO_2, composed of colored lavers or clouds It is used as a semi-precious stone, for ornaments, for pebbles in ball mills, and for the knife-edges of chemical balances **blood-** Hemachate **Iceland-** An obsidian **oriental-** A translucent variety used as a gem **white-** Chalcedony

agathin $C_{14}H_{14}ON_2$ = 226 2 Cosmin Salicyl-α-methyl-phenylhydrazine, HO C_6H_4 CH - N NMe Ph A yellow, odorless, tasteless crystalline powder, m 74, insoluble in water, but soluble in alcohol or ether Used medicinally in neuralgia and rheumatism

Agathis A conifer of Australia and Malaya which furnishes the kauri resin

Agave American aloe A genus of Central American plants of the order Amaryllidaceae The fibres are used for threads and ropes, while the leaves and juice are used as a diuretic The fermented juice (pulque) is a moderately stimulating drink which is popular in Mexico, from it is distilled a spirit (mescal) Cf *henequen*, *sisal*

agedoite Asparagine

ageing Aging

Agene process The bleaching of flour with nitrogen trichloride

agent A substance or force that effects a change Cf *reagent* **balancing-** See *buffer* and *poiser* **catalytic-** See *catalyst* **emulsifying-** See *emulsifier* **freezing-** See *freezing mixtures* **frothing-** See *frother* **oxidizing-** See *oxidizing* agent **reducing-** See *reducing* agent **refrigerating-** The gases NH_3, SO_2 or MeCl, which are used in refrigerators **refining-** Substances *e g*, H_2SO_4 or NaOH, used to purify organic compounds **vulcanizing-** See *vulcanization* **warning-** An odorous substance used to indicate danger in mines, or to detect leakage in pipes

agerite Aldo-α-naphthylamine, an anti-aging agent for rubber Cf *ohmoil*

Agfa A trade name for dyes, fine chemicals, etc (Aktien Gesellschaft fur Anilin farben) **A silk** A viscose rayon

agglomeration A clustering together or accumulation of particles or substances

agglutinant A substance which causes agglomeration or agglutination of cells

agglutinate (1) To cause agglutination (2) The product of agglutination

agglutination The clumping together of cells or bacteria which results from the interaction of bacteria and the corresponding immune serum It is used in serodiagnosis

agglutinins A group of substances formed in the blood as a result of bacterial infection or inoculation which cause the clumping together of the bacteria Cf *conglutinin*, *hemaglutinin*

agglutinogen A substance present in bacteria which stimulates the production of agglutinins in animals

aggregation The gathering of units into a whole or the crowding or clustering together of particles **state of-** The physical form of matter, as, solid, liquid, gaseous, or colloidal

aggresin Any toxic substance given off by an infecting organism (bacteria) that inhibits the defensive reactions of the host, *e g*, substances which protect micro-organisms from phagocytosis

aging, ageing Natural, or, artificial maturing or ripening, as of cheese, wine, or rubber **a test** A test involving exaggerated conditions of a the object of which is to determine rapidly how a material will behave over a period of time

agitator A device to keep liquids in motion as a stirrer

aglucone The non-sugar part of a glucoside

aglycone That component of a glycoside *e g* plant pigment, which is not a sugar Cf *crocetin*, *cyclamiretin*, etc

agmatine $C_5H_{14}N_4$ = 130 2 Aminobutyl guanidine, $NH_2C(NH)\ NH(CH_2)_4NH_2$ An amine isolated from herring spawn and ergot Cf *synthalin*

agnetite A mineral constituent of adamellose

agnin Lanolin

agon The active radical of an enzyme Cf *pheron*

agoniadin $C_{21}H_{26}O_{12}$ = 470 2 Plumieрin The active principle of the bark of *Plumeria succuba* or pagoda tree Used medicinally as an antipyretic, anthelminthic and emmenagogue

Agricola, Georg Bauer 1490–1555 A German physician and alchemist

agriculture. The science and art of the cultivation of the soil

agrimonia oil The volatile oil of agrimony

agrimony A rosaceous plant, *Agrimonia eupatoria*, used medicinally in the form of a fluid extract as a tonic and astringent

agrinite A trade name for a tankage (q v) containing 8¼ % nitrogen

agrostemma Corncockle The plant, *A githago*, a Caryophyllaceae, poisonous to animals and man **a saponin** $C_{35}H_{54}O_{10}$ (*Brandl*) or $C_{29}H_{44}O_4$ (*Wedekind & Schicke*) A hemolytic substance, m 286 It causes paralysis

agucarina Saccharin

ague tree Sassafras

aguilarite Ag_4SSe A sulfoselenide of silver, occurring as a black mineral

aguirin Theobromine sodium acetate

Agulhon's reagent A 0 1 N-solution of chromic acid in dilute nitric acid, used to titrate primary alcohols

agurin Aguirin

Aich's metal An alloy containing 56 pts copper, 42 pts zinc and 1 pt iron which is very malleable at red heat

aikinite $CuPbBiS_3$ Aikenite A black, orthorhombic, copper lead bismuth sulfide

ailanthic acid A bitter, nitrogenous acid from the bark of *Ailanthus excelsa* or "tree of heaven," a Simarubaceae

air The mixture of gases that forms the atmosphere, q v **alkaline-** Ammonia **azotic-** Nitrogen **dephlogisticated-** An obsolete term for oxygen **enriched-** a to which oxygen has been added **expired-** The warm a coming from the lungs having less oxygen and more carbon dioxide and moisture than normal a **fixed-** An obsolete term for carbon dioxide **inspired-** The air which is taken into the lungs **liquid-** A clear water-like liquid obtained by alternate compression and expansion of air in a refrigeration machine, b −181 Used commercially for manufacturing oxygen, in the production of low temperatures, and applied externally as a cure for poison ivy or poison oak inflammations **mephitic-** An obsolete term for carbon dioxide **phlogisticated-** An obsolete term for nitrogen or air from which oxygen has been removed by a burning substance **reserve-** The air that can still be exhaled after an ordinary expiration **residual-** (1) The air that remains in the lungs after the most complete expiration possible (2) The air that remains in an evacuated container, *e g*, an incandescent lamp bulb or vacuum tube **tidal-** The air that is taken in and given out at each respiration **vital-** Oxygen

a bath A drying oven utilizing a current of heated air for maintaining a certain temperature **a compressor** A pump which compresses the atmosphere **a conditioning** The control of humidity and temperature of air by filtering and washing with water of definite temperature, either for human comfort (45–55 % humidity) or for industries (viscose, textile, candy, paper, etc) **a dry** To expose to air without heating **a gas** Producer gas **a liquefying apparatus** An arrangement of high pressure pump, valves, and expansion orifices for the liquefaction of air **a melting oven** A cylindrical copper box with mica windows which is used for melting pitch in a current of hot air **a meter** Anemometer **a pump** A mechanical device for compressing or withdrawing air, *e g*, blowers, blast apparatus, filter pumps, vacuum pumps, or compressors **a proof** Hermetically sealed, or gas-tight **a sampler** A device for taking samples of dust and bacteria from the air **a tester** An instrument to determine the CO_2 content of the atmosphere

airoform Airol

airol $C_7H_6O_6IBi_1$ = 522 1 Bismuth oxyiodogallateg, $C_6H_2(OH)_3COOBi(OH)I$ A greenish-gray powder, used as an antiseptic dusting-powder for wounds

airosol Aerosol

ajacine $C_{15}H_{21}O_4N$ = 279 17 A crystalline alkaloid, m 143, from larkspur, *Delphinium ajacis* **a hydrochloride** $C_{15}H_{21}O_4N\,HCl$ = 315 64 Colorless crystals, m 93, soluble in water

ajakol, ajacol Thanatol

ajava The ripe fruit of *Ammi* or *Carum copticum*, (Umbelliferae) of India, used as a carminative

Ajax metal A bearing alloy consisting of 25–50 % Ni, 70–30 % Fe and 5–20 % Cu

aji-no-moto Sodium glutamate made by acid hydrolysis from gluten of wheat It is a white powder of cheesy odor and meaty taste, used as a condiment

ajowan Ajava **a oil** The essential oil from the seeds of *Carum copticum* or ajava It resembles caraway seed oil, d 0 900–0 930, $[\alpha]_D$ + 1 3, and contains thymol and cymene as chief constituents

akazgine An alkaloid from the bark and leaves of *Strychnos akazga*, a Loganiaceae of Africa Colorless crystals resembling strychnine in therapeutic effect

akcethin Thioacetin

akee oil A non-drying, yellow, butter-like fat from *Blighia sapida*, (Sapindaceae) from Jamaica and the Guineas

åkermanite A melilite, $4CaO\,3SiO_2$

akuammine $C_{22}H_{28}O_4N_2$ = 382 23 An alkaloid from the seeds of *Picralima klaineana* an Apocynaceae of Gaboon Cf *ditaine*

akundarol $C_{38}H_{61}O\,OH$ = 550 5 A sterol from akanda, *Calotropis gigantea*, an Asclepiadaceae Cf *calotropin, mudaric acid*

Al (1) The symbol for aluminum (2) Alkyl radical

-al A suffix indicating an aldehyde structure

alabamine Ab = 221 Ekaiodine The element No 85 discovered in monazites and by the magneto-optic method by Allison, et al (1931) It is a homotope of iodine, but its existence has not been verified Cf *anglo-helvetium*

alabandite Manganblende A black, isometric, native manganous sulfide, MnS

alabaster A fine grained, colorless, compact gypsum, $CaSO_4,\,2H_2O$ See *selenite*

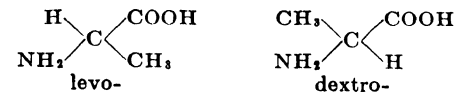
alabastrine Naphthalene

alacreatine $C_4H_9O_2N_3$ = 131 2 Lactyl guanidine Guanidopropionic acid An isomer of creatine, which is formed by the union of alanine and cyanamide

alamandite Almandite

alangine An alkaloid from the bark of *Alangium lamarckii*, (Cornaceae) of India, used as a febrifuge and emetic

alanine $C_3H_7O_2N$ = 89 08 α-Aminopropionic acid, propionic glycocol, lactamine, 2-aminopropanoic acid*, lactamic acid White crystals, **dl-** or **l-** m 295 **d-** m 297, **l-** 295°C, subl 200, soluble in water or alcohol, insoluble in ether It is prepared synthetically from acetaldehyde, ammonia and HCl or HCN and occurs as a constituent of many proteins (See *polypeptides*) It forms two stereoisomers



β- or *beta-* *3*-Aminopropanoic acid* ***N*-benzoyl-** $C_{10}H_{11}NO_3$ = 193 09 *α*-Benzamidopropionic acid, PhCONH CHMe COOH Colorless crystals, m 163, soluble in water **dithiobis-** Cystine **hydroxy-** Serine **hydroxyphenyl-** Tyrosine **imidazolyl-** Histidine **indyl-** Tryptophane **mercapto-** Cysteine **phenyl-** Phenylalanine **salicyl-** *o*-Tyrosine **sulfo-** Cysteic acid

alant acid anhydride See *helenin* **a camphor** Helenin **a root** Inula **a starch** Inulin

alantic acid $C_{15}H_{22}O_3$ = 250 2 Inulic acid A monobasic acid from the roots of *Inula elecampane* **a anhydride** $C_{15}H_{20}O_2$ = 232 2 Colorless crystals from the roots of *Inula elecampane* It is sometimes found as an incrustation on roots kept for some time

alantin Inulin

alantol $C_{10}H_{16}O$ = 152 1 Pinguin A yellowish-brown oily liquid, b 200, soluble in alcohol, ether, or chloroform It is obtained from the roots of *Inula elecampane* and is used as an internal antiseptic

alantolactone See *helenin*

alanyl (1) The monovalent radical Me $CHNH_2$-CO— (2) The divalent radical —NH CHMe-CO—, derived from alanine **a alanine** $C_6H_{12}N_2O_3$ = 160 11 A dipeptide White needles, m 276, slightly soluble in water

alaskite An igneous rock of the rhyolite-granite group containing quartz and feldspar (aplite)

alaskose A rhyolite containing phenocrysts of quartz and feldspar

alaterite Mineral caoutchouc

albahaca oil See *tolu* oil

albamine Alabamine

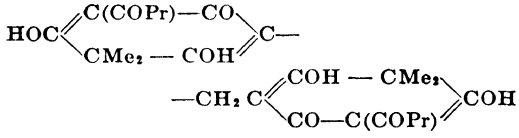
albane $C_{10}H_{16}O$ = 152 1 A crystalline resinous product obtained by boiling gutta-percha in alcohol It is soluble in ether, chloroform or carbon disulfide

albanose A leucite rock containing leucite, melilite, diopside, and magnetite

albargin Silver gelatose A colloidal silver preparation used medicinally

albarium A white lime obtained by burning marble It is used for stucco

albaspidin $C_{25}H_{32}O_8$ = 460 2



A crystalline principle occurring in *Aspidium* and resembling *albopannin*

albata A white alloy of Cu, Ni and Zn A German silver

albedo The degree of whiteness of a reflecting surface It is expressed as the ratio of the reflected light to the incident light *e g*,

black velvet	0 004
moist earth	0 08
blue paper	0 26
pinewood	0 40
white paper	0 60
snow	0 78

albene An insoluble white precipitate obtained by boiling melam in water

alberene A fine grade of soapstone used for electrical insulation

albertite Albert coal A black, brittle, asphaltum-like hydrocarbon with conchoidal fracture, d 1 1 It is used as fuel

albertol A plastic q v, of the phenolformaldehyde type Cf *bakelite*

Albertus, Magnus 1203–1280 Albrecht Graf von Bollstadt A German alchemist noted for his writings

albite $NaAlSi_3O_8$ Pericline A white, triclinic soda-feldspar which is a common constituent of granite and many other rocks d 2 605 Hardness 6–6 5, Mol Vol 101 1 Cf *anemonsite*

albocarbon Naphthalene

alboferrin Phospho-albuminate of iron A light-brown, odorless powder, used as a ferruginous tonic

albolene A brand of medicinal Russian mineral oil Cf *petrolatum*

albopannin $C_{21}H_{24}O_7$ = 388 2 Silky white, crystalline needles, m 147, obtained from the rhizome of *Aspidium* or male fern

albumate Albuminate **tannin-** Tannalbin

albumen White of egg The liquid white of fresh eggs, consisting chiefly of albumin

albumin (1) $C_{72}H_{112}N_{18}O_{22}S$ A protein found in the white of egg, and occurring in blood, lymph, chyle, and many other animal and vegetable tissues and fluids It is soluble in water, coagulates on heating, and is hydrolyzed to a number of amino acids It occurs in commerce as white or yellowish scales (2) A simple *protein*, q v, which is insoluble in pure water or dilute salt solution and is coagulable by heat Cf *globulin* **blood-** Serum a A prepared from blood and used in the manufacture of photographic papers, in textile printing, leather industry and as a clarifying agent **egg-** Ovalbumin A prepared from eggs It is used in food stuffs and as a clarifying agent **milk-** Wheyalbumin A prepared from milk by coagulating the casein It is used in the manufacture of adhesives, varnishes and ivory substitutes **nucleo-** See *nucleo*albumin **osso-** A protein from ossein **ov-** Egg a **phospho-** Any albuminous substance which contains phosphorus **serum-** Blood a **whey-** Milk a **a tannate** Tannalbin

albuminate A compound of albumin with some other substance, often of a basic character, as, metals (bismuth, iron, manganese, mercury) or creosote, ichthyol, quinine, tannin, etc **acid-** A metaprotein soluble in weak alkali **alkali-** A compound of albumin and alkali metals

albuminoid (1) Resembling or like albumin (2) Scleroproteins A class of simple proteins, q v, which are insoluble in all neutral solvents *e g* collagen, gelatin, keratin, chitin

albuminometer A graduated glass tube for the quantitative determination of albumin in urine Cf *Esbach's a horismascope*

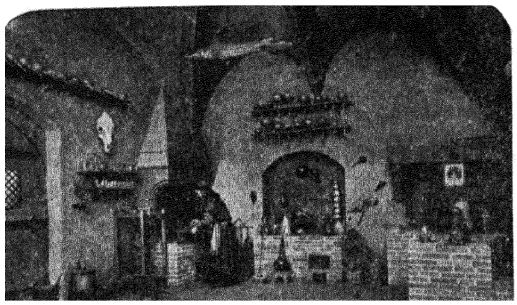
albuminose A decomposition product of fibrin

albuminuria The presence of albumin in the urine, and the resulting pathological condition of the human body

albumoscope A U-shaped glass tube for the detection of albumin in urine One arm is filled with nitric acid and the other with urine, and at the point of contact a white ring forms in presence of albumin

albumose A cleavage product of albumin formed during its hydrolysis Cf *artose*, *dysalbumose*, *heteroartrose*, *syntonin*

albumosease. An enzyme from the stomachic secretions which hydrolyzes albumin to albumose.
alburnitas. A disease of trees, which hinders the transformation of sapwood into hardwood.
alburnum. The sapwood of a tree.
alcahest. Alkahest.
alcamines. Alkamines.
alcarraza. An unglazed bottle used in the Mediterranean countries for cooling water by evaporation.



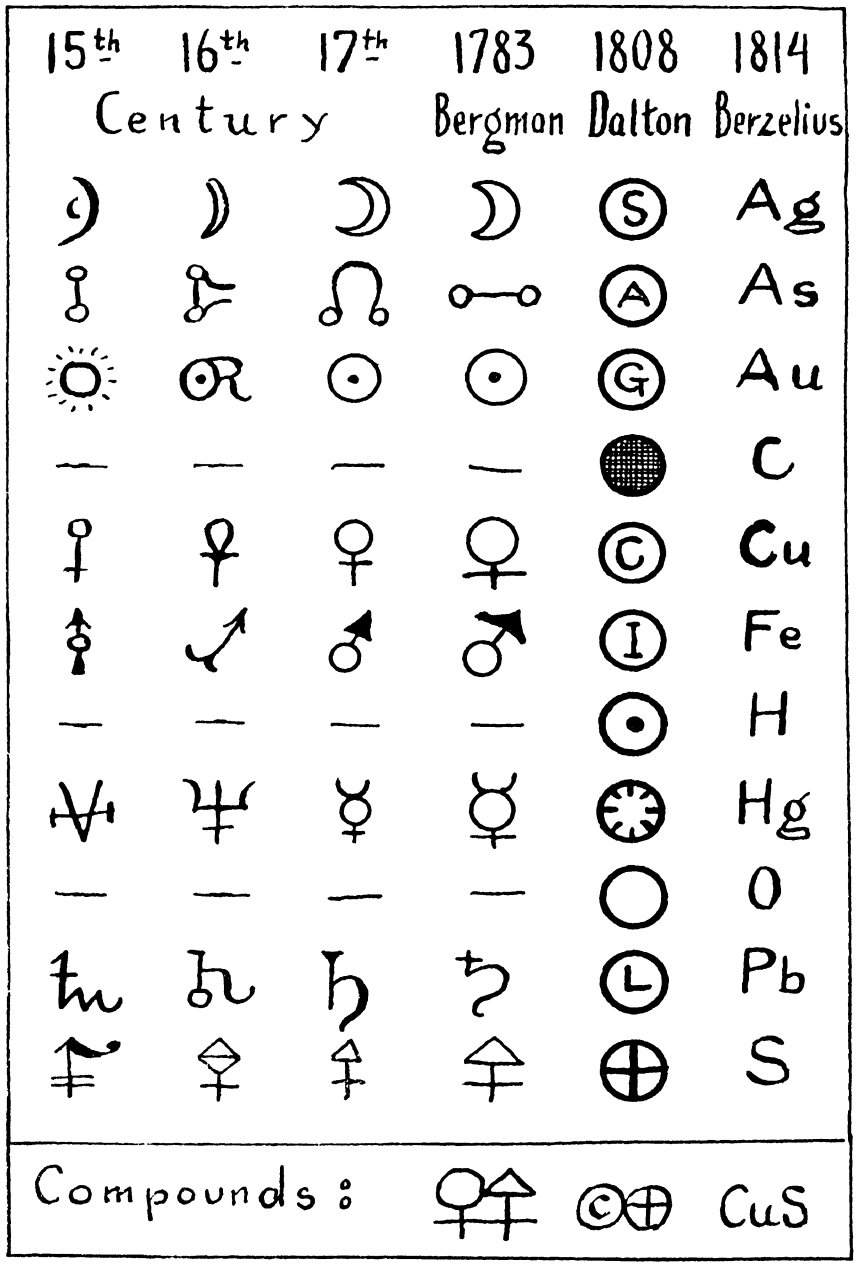
Alchemical laboratory.

alchemical. Pertaining to alchemy; alchemistic. **a. laboratory.** The alchemist workshop. **a. symbols.** See *alchemistic* symbols.
alchemistic period. The time period extending from about 300 to 1550 A.D. **a. symbols.** The characters or ideographs used by the alchemists. They indicate the relationship of astrological and alchemical speculations. In the development of chemistry the conception of the atomic theory can be followed by comparing a few of the alchemical symbols of elements and noting the transitional Dalton symbols. See figure.
alchemy. The empirical stage of chemical knowledge, which was characterized by many attempts to impose the speculative theories formed by philosophical imaginations. The chief aim of alchemy during the Middle Ages was the transmutation of base metals into gold, and the search for the alkahest or philosopher's stone which was supposed to confer eternal youth and health. During this period much chemical knowledge accumulated which led to a change of attack, namely to the experimental and deductive method of modern science.
alclad. A strong, light aluminum alloy which is coated with pure aluminum to resist corrosion.
alcohol. (1) Ethanol or ethyl alcohol. (2) See *alcohols*. **absolute-** See ethanol, 100 %. **acetone-** See *acetol*. **allyl-** See *allyl* alcohol. **amyl-** See *amyl* alcohol. **benzyl-** See *benzyl* alcohol. **butyl-** See *butanol*. **butyric-** See *butanol*. **capryl-** See *octyl* alcohol. **cetyl-** See *cetyl* alcohol. **cinnamyl-** See *cinnamic* alcohol. **dehydrated-** See *ethanol*, 100 %. **denatured-** See *ethanol*. **ethyl-** See *ethanol*. **ethylene-** See *glycol*. **ethylic-** See *ethanol*. **glycyl-** See *glycerol*. **grain-** See *ethanol*, 95 %. **hexadecatylic-** See *cetyl* alcohol. **isobutyl-** See *isobutanol*. **isopentylic-** See *amyl* alcohol. **isopropyl-** See *i-propanol*. **methyl-** See *methanol*. **octoic-** See *caprylic*. **octylic-** See *caprylic* alcohol. **palmityl-** See *cetyl* alcohol. **phenylallyl-** See *cinnamic* **a. solid-** A gelatinous mixture of ethanol with solid fatty acids or with soaps. Used as household fuel for chafing dishes. **sulfur-** See *carbon* disulfide. **wood-** See *methanol*.

a. acid. A group of organic compounds which contain the carboxyl and the hydroxyl radicals. See table. **a. aldehyde.** A compound of the type HO.R.CHO; as, aldol. **a. amide.** Hydroxy amide. A compound of the type $HO.R.CONH_2$; as, glycolamide. **a. amine.** Hydroxyamine. A compound of the type, $HO.R.NH_2$; as, ethoxyamine **a. ether.** Hydroxyether. A compound of the type R.O.R.-OH; as, diethyline, cellosolve. Cf. *lacquer*

ALCOHOL ACIDS

(1) *Aliphatic, monohydroxy, monobasic acids*	
carbonic acid, hydroxyformic acid	HO.COOH
glycolic acid, hydroxyacetic acid	$HO.CH_2.COOH$
lactic acid, 1-hydroxypropionic acid	Me.CHOH.COOH
hydracrylic acid, 2-hydroxypropionic acid	$HO.CH_2.CH_2.COOH$
3-hydroxybutyric acid	$HO.CH_2CH_2CH_2.COOH$
2-hydroxybutyric acid	$Me.CHOH.CH_2.COOH$
1-hydroxybutyric acid	Et.CHOH.COOH
(2) *Aliphatic, dihydroxy, monobasic acids*	
glyoxylic acid, dihydroxyacetic acid	$(HO)_2CH.COOH$
glyceric acid, 1-2, dihydroxypropionic acid	$CH_2OH.CHOH.COOH$
(3) *Aliphatic, polyhydroxy, monobasic acids*	
erythric acid	$CH_2OH(CHOH)_2COOH$
arabitic acid	$CH_2OH(CHOH)_3COOH$
mannitic acid	$CH_2OH(CHOH)_4COOH$
(4) *Aliphatic, monohydroxy, dibasic acids*	
tartronic acid, hydroxymalonic acid	HOOC.CHOH.COOH
malic acid, hydroxysuccinic acid	$HOOC.CH_2CHOH.COOH$
(5) *Aliphatic, dihydroxy, dibasic acids*	
tartaric acid, dihydroxysuccinic acid	$HOOC.(CHOH)_2COOH$
(6) *Aliphatic, polyhydroxy, dibasic acids*	
trihydroxyglutaric acid	$HOOC(CHOH)_3COOH$
saccharic acid, tetrahydroxyadipic acid	$HOOC(CHOH)_4COOH$
(7) *Aliphatic, monohydroxy, tribasic acids*	
citric acid	$HO>C<\begin{matrix}CH_2COOH\\CH_2COOH\end{matrix}$ (HOOC)
(8) *Aromatic, monohydroxy, monobasic acids*	
mandelic acid	PhCHOHCOOH
phenyl-lactic acid	$PhCH_2.CHOH.COOH$
tropic acid	Ph.CH(COOH).CH_2OH



Alchemical and chemical symbols

The first one to *join* symbols in order to represents compounds was Bergman Next Dalton simplified the symbols by using circles and letters and Berzelius introduced our present notation

solvents a fuel A blend of ethyl, methyl or butyl alcohol with benzol, petrol, acetone and/or ether **a ketone** Hydroxyketone A compound of the type R CO R OH, **as, ketol a phenols** ar-Hydroxyphenols A group of organic compounds that contain hydroxy groups attached both to a ring and to a side-chain, **as,**

o-hydroxybenzyl alcohol, salicyl alcohol $C_6H_4OH\ CH_2OH$

dihydroxybenzyl alcohol, pyrocatechuic alcohol $C_6H_3(OH)_2\ CH_2OH$

trihydroxybenzyl alcohol, pyrogallic alcohol $C_6H_2(OH)_3\ CH_2OH$

alcoholic (1) A preparation containing an alcohol (usually ethanol), **as, a** extract, **a** solution (2) Leading to the formation of alcohol, **e g a** fermentation (3) Dissolved in alcohol, **as, a** potash

alcoholate A compound derived from an alcohol by replacing the hydroxyl hydrogen by a base, as, sodium ethylate or alcoholate, EtONa

alcoholometer An apparatus for estimating the alcohol content of a liquid, a hydrometer, or apparatus for determining the b p of an alcohol-water mixture

alcohols Alkyloxides A group of organic alkyl-compounds containing a hydroxyl group R OH A are classified (1) according to the relation of the carbon atom, as

primary a	R CH_2OH
secondary a	R_2CHOH
tertiary a	R_3COH

(2) according to the number of OH groups, as,

		prefix		*suffix*
R OH	mono-	-hydroxy*	a or	ol*
R $(OH)_2$	di-	-atomic		diol*
R $(OH)_3$	tri-	-basic		triol*
R $(OH)_4$	tetra-	-hydric		tetrol*
R $(OH)_5$	penta-	-valent		pentol*
R $(OH)_x$	poly-			—

(See also aromatic *alcohol*, *alcohol* phenol and *alcohol* acid)

(1) *Monatomic aliphatic alcohols*, $C_nH_{2n+1}OH$

methyl alcohol, methanol	CH_3OH or MeOH
ethyl alcohol, ethanol	C_2H_5OH or EtOH
propyl alcohol, propanol	C_3H_7OH or PrOH
butyl alcohol, butanol	C_4H_9OH or BuOH
amyl alcohol, pentanol	$C_5H_{11}OH$
hexyl alcohol, hexanol	$C_6H_{13}OH$
heptyl alcohol, heptanol	$C_7H_{15}OH$
octyl alcohol, octanol	$C_8H_{17}OH$
nonyl alcohol, nonanol	$C_9H_{19}OH$
decyl alcohol, decanol	$C_{10}H_{21}OH$
dodecyl alcohol, dodecanol	$C_{12}H_{25}OH$
tetradecyl alcohol	$C_{14}H_{29}OH$
cetyl alcohol	$C_{16}H_{33}OH$
carnaubyl alcohol	$C_{24}H_{49}OH$
ceryl alcohol	$C_{26}H_{53}OH$
melissyl alcohol	$C_{30}H_{61}OH$
tarchonyl alcohol	$C_{50}H_{101}OH$

(2) *Diatomic aliphatic alcohols*

glycols, *e g* , glycol	$C_2H_4(OH)_2$
pinacols, *e g* , pinacone	$C_6H_{12}(OH)_2$

(3) *Triatomic aliphatic alcohols*

glycerol	$C_3H_5(OH)_3$

(4) *Polyatomic aliphatic alcohols*

tetritol, *e g* , erythrol	$C_4H_6(OH)_4$
pentitol, *e g* , arabitol	$C_5H_7(OH)_5$
hexitol, *e g* , mannitol	$C_6H_8(OH)_6$
heptitol, *e g* , perseite	$C_7H_9(OH)_7$

Cf *Agulhon's* reagent

aldehyde- A compound containing both, the —CHO and —OH groups **aromatic-** A cyclic compound containing the —OH group in a side chain, cf the *phenols* **diatomic-** or **dihydric-** An aliphatic compound containing two —OH groups (see *glycol*) **hexatomic-** or **hexahydric-** An aliphatic compound containing six —OH groups derived from hexoses **keto-** A compound containing both, the =CO and —OH groups **monatomic-, monobasic-,** or **monohydric-** A compound containing one —OH group **nitrated-** A compound containing the $—ONO_2$ group **pentatomic-, pentabasic-,** or **pentahydric-** A compound containing five —OH groups **primary-** A compound containing the monovalent carbinol group, $—CH_2OH$ **secondary-** A compound containing the divalent =CHOH group **tertiary-** A compound containing the trivalent ≡COH group **triatomic-, tribasic-** or **trihydric-** A compound containing three —OH groups, (see *glycerol*)

a of crystallization The alcohol contained in a crystalline salt in a molecule, *e g* $KOH \cdot 2C_2H_6O$

alcoholysis The cleavage of a C—C bond by the addition of an alcohol $R CH_2 R' + R''OH \rightarrow R''OCH_2R + R'H$ Cf *hydrolysis*

alcosol A sol in alcohol

alcumite A steel-like and corrosion resistant alloy of 88–90 % Cu, 7 5 % Al, 2 8–3 5 % Fe and 1 % Ni

alcyl Alicyclic An aliphatic-cyclic radical, a saturated aromatic radical

aldalcoketose A carbohydrate containing the aldehyde (—CHO), alcohol (—OH), and ketone (=CO) radicals

aldebaranium Ad = 173 60 A rare earth metal, isolated in 1907 by Auer von Welsbach and identical with thulium, q v

aldehydase An oxydase (cf *enzymes*) which forms acids from aldehydes

aldehyde (1) Acetic aldehyde or acetaldehyde (2) See *aldehydes* **acetic-** Acetaldehyde **anisic-** Anisaldehyde **cinnamic-** Cinnamaldehyde **cuminic-** Cumic aldehyde **heptylic-** Oenanthal **meta-** Metaldehyde **oenanthic-** Oenanthal **para-** See *paraldehyde* **propionic-** Propionic aldehyde **pyromucic-** Furfural **salicylic-** Salicylaldehyde

a ammonia (1) A member of a class of compounds formed by the combination of an aldehyde and ammonia They are crystalline and decompose on warming with dilute acid, and are consequently used for the purification of aldehydes (2) $(CH_3 CHO,NH_3)_3 = 183\ 24$ Colorless crystals, m 70–80, b 100, soluble in water, alcohol or ether **a condensation** See *aldol* condensation **a group** The monovalent —CHO radical, in which the H is not replaceable by a positive radical, but can be replaced by negative atoms or groups (Cl_2 etc) Cf *aldehydes* **a ketone** Ketoaldehyde A compound of the type, R CO R CHO

aldehydes Organic compounds containing the monovalent —CHO radical They are oxidized to acids and reduced to alcohols They are indicated by the *prefix* oxo-, aldo- (for O of CO) or formyl- (for CHO), or by the *suffix* -al*, -dial*, -trial*, etc **amido-** Compounds containing both, the amido and aldehyde groups **di-** Compounds containing two aldehyde groups **olefine-** Compounds containing a double bond and the aldehyde group **paraffin-** Compounds containing the aldehyde group attached to a saturated aliphatic chain **thio-** Compounds containing the —CHS group, *i e* , an aldehyde group in which the oxygen is replaced by sulfur

ALDEHYDES

a aliphatic and saturated

formaldehyde	H CHO
acetaldehyde	Me CHO
propionaldehyde	Et CHO
butyraldehyde	$Me(CH_2)_2$ CHO
i-butyraldehyde	Me_2CH CHO
valeraldehyde	$Me(CH_2)_3$ CHO
i-valeraldehyde	Me_2CH CH_2 CHO
caproaldehyde	$Me(CH_2)_4$ CHO
enanthaldehyde	$Me(CH_2)_5$ CHO
nonaldehyde	$Me(CH_2)_7$ CHO
palmitic aldehyde	$Me(CH_2)_{14}$ CHO

b aliphatic and unsaturated

acrolein	CH_2 CH CHO
crotonaldehyde	MeCH CH CHO
tiglic aldehyde	MeCH CMe CHO
citral, geranial	C_9H_{15} CHO
propiolaldehyde	CH C CHO

c aliphatic dialdehydes

glyoxal	CHO CHO
succinaldehyde	$CHO(CH_2)_2$ CHO
adipaldehyde	$CHO(CH_2)_4$ CHO

d aromatic aldehydes

benzaldehyde	Ph CHO
tolualdehyde	Me C_6H_4 CHO
α-tolualdehyde	Ph CH_2 CHO
cinnamaldehyde	Ph CH CH CHO
salicylaldehyde	HO C_6H_4 CHO
anisaldehyde	MeO C_6H_4 CHO
naphthaldehyde	$C_{10}H_7$ CHO
anthraldehyde	$C_{14}H_7$ CHO

aldehydene Acetylene

aldehydic hydrogen The hydrogen atom of the aldehyde group which is not readily replaced by metals

aldehydine $C_8H_{11}N$ = 121 14 2-Ethyl-5-methyl pyridine C_5H_3NMeEt A colorless liquid, d $_{23}$°0 9918, b 173, insoluble in water, and soluble in alcohol or ether

aldime An acid imide of the type, R—CH(NH) derived from an aldehyde

aldobionic acids A group of oxidized trisaccharides, as, gluco-β-glycuronic acid, found in bacteria, or obtained by the hydrolysis of flaxseed mucilage

aldohexose A hexose containing the aldehyde group, as glucose or galactose, cf *ketohexose, sugars*

aldoketens A group of homologs of ketene, RHC CO (see *keto*ketene) It comprises ketene, and monoalkylated derivatives of carbon suboxide They are colorless and are polymerized by pyridine

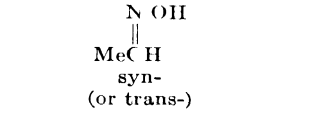
aldol $C_4H_8O_2$ = 88 08 (1) β-Hydroxy-butyric aldehyde, 3-hydroxybutanal*, acetaldol oxybutanol, Me CHOH CH_2 CHO A condensation product or dimer of acetaldehyde A clear colorless liquid, d 1 109, soluble in hot water or alcohol Its solution leaves a polymerized product, paraldol, on evaporation It is used medicinally as a hypnotic and sedative Cf *paraldehyde* (trimer), *metaldehyde* (tetramer), *paraldol* (2) One of a class of condensation products formed from an aldehyde

a condensation The polymerization of an aldehyde in presence of dilute acid or alkali, *e g*, the formation of aldol The aldol polymer differs from the meta- and para-polymers by reason of its stability There are three types (1) true aldol condensation $R_2CO + H CH_2$ COR → $R_2C(OH)$ CH_2 COR → $R_2C{=}CH$ - COR (2) Cannizzaro reaction 2R CHO → R COOCH$_2$RR COOCH$_2$R + H_2O → R COOH + R CH_2OH (3) Claisen condensation 2R - C OOR′ → RC(OH) CH COOR′ + R′OH

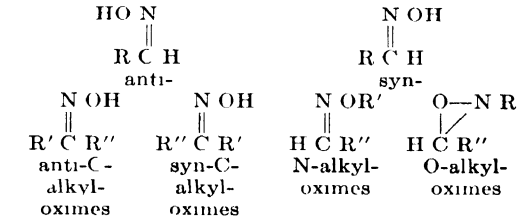
aldopentose A pentose containing the aldehyde group, as arabinose

aldose Any carbohydrate (pentose, hexose, etc) which contains the aldehyde group Cf *ketose sugars*

aldoxime C_7H_5ON = 59 05 Acetaldoxime A colorless liquid m 45 b 115 d 0 965 soluble in water, alcohol or ether It is used in organic synthesis and occurs in two isomeric forms



aldoximes A group of organic compounds containing the monovalent —C HNOH, or the divalent $\diagdown$C NOH $\diagup$ group, from which different stereo-isomeric forms are derived as follows



N B In the formula the alkyl is replaceable by aryl

aldrey A non-corroding aluminum alloy, used for transmission lines It contains 0 4 % Mg, 0 6 % Si, and 0 3 % Fe

alembic A retort Figuratively, anything that purifies

aletris False unicorn, starwort, blazing star, colic root, star grass, bitter grass, devil's bit The dried rhizomes of *Aletris farinosa* (Haemodoraceae) of the United States Used medicinally as a tonic Cf *helonoid*

aletroid Aletrin A resinoid from the rhizome of *Aletris farinosa* Used as a uterine stimulant

Aleurites (1) The Chinese wood or tung oil plant (2) A genus of trees, Euphorbiaceae, of the warmer zones of Asia which yield important oils

A ambina	bancoul nut oil
A cordata	tung oil
A mollucana	lumbang oil
A triloba	wood oil

aleutric acid $C_{16}H_{32}O_5$ = 304 3 A trihydroxy-palmitic acid, m 102, from the shellac of *Aleurites montana*

aleurometer A baking cylinder for testing the baking capacity of flour by measuring the expansion of its gluten

aleuronate A vegetable protein used as food for diabetics It is a tasteless, yellowish powder

a powder A baked flour mixed with cooked starch used for injection into the pleural cavity of animals (rabbits) to stimulate the production of leucocytes Cf *leucocyte* extract

aleurone Protein grains in the endosperm of ripe seeds

Alexander tester An apparatus for determining the gel-strength of glue and gelatin

alexandrite An emerald green variety of chrysoberyl with ruby-red fluorescence Used as a gem

alexandrolite A clay-like silicate containing chromium

alexin Complement, cytase A defense protein of body fluids that partly destroys pathogenic microorganisms It is thermo-labile, non-specific, not increased by immunization and present in leucocytes and serum It has also the property of combining with the antigen-antibody See *immunity, Ehrlich's theory, antilysin*

alfa Halfa A variety of esparto grass grown in Algeria and Tunis Paper is made from its bast fibers

alfalfa Lucerne The plant *Medicago sativa*, a Leguminosae, used as fodder

alfalfone $C_{21}H_{42}O$ = 310 3 A ketone from alfalfa

alferric Containing alumina and ferric oxide **a minerals** A group of igneous rocks which contain aluminum and iron, intermediate between the salic and femic groups

alga pl **algae** A group of unicellular or polycellular plants of the order Thallophytae a class of cryptograms, which live in fresh or salt water and are distinguished from other microorganism (fungi) by the presence of chlorophyll and response to photosynthesis Cf *lichens* They include the sea weeds, kelps, chondrus agar-agar, diatoms and spirogyra and are classified into

Cyanophyceae	*blue-green* or *fission* a
Phaeophyceae	*brown* a
Chlorophyceae	*green* a
Rhodophyceae	*red* a

calcareous- A containing Ca as *Lithothamnium* whose skeletons consist of 95 % $CaCO_3$ and 5 % $MgCO_3$, and whose deposits are limestone **siliceous-** The slimy ooze at the bottom of oceans, consisting of 77 % silica, it is formed by diatoms and radiolarians, and includes the skeletons of algae Cf *oceanic* sediments

algarites The naturally occurring protobitumens formed during the acid hydrolysis of algae They consist of algarose with metallic salts, sulfur and nitrogen derivatives

algaroba Algarobilla The sweet pods of *Prosopsis dulcis*, a herb of South America It contains 45 % tannin and is used for tanning, and in the preparation of a gum

algarose A protobitumen formed by acid hydrolysis of carbohydrates, it reduces Fehling's solution

algaroth Antimony oxychloride A white powder, used as a purgative and emetic

algin Alginic acid, norgine A protein of marine algae, obtained as by-product in the preparation of iodine from kelps, principally from *Laminaria digitata* It is used as a fabric dressing and for thickening jellies Its solution in sodium carbonate is used as a mucilage

alginate Any of the salts of algin, as the iron or sodium alginate They are used as protective colloids, for thickening solutions, for forming films on drying, and for textile dressing

alginic acid Algin

algiron Iron alginate A preparation used medicinally in anemia

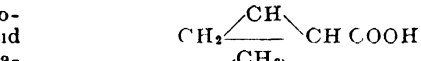
algodonite Cu_6As A silver-white to steel-gray native copper arsenide

algulose The almost pure cellulose obtained, to the extent of 15 %, in the extraction of iodine from kelp Used in paper making

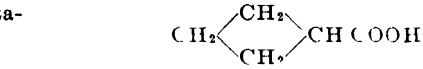
alibate To cover with a protective layer of aluminum

alicyclic Aliphatic-cyclic The group of cyclic organic compounds derived from the corresponding aliphatic compounds by ring-formation, those compounds having a saturated ring, as, the cyclo-paraffins and naphthenes **a acids** A group of acids whose molecules contain a saturated ring, as

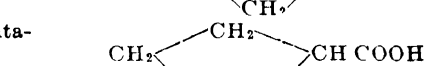
Cyclopropanoic acid



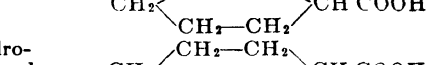
Cyclobutanoic acid



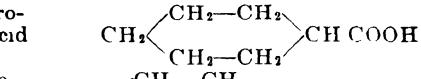
Cyclopentanoic acid



Hexahydrobenzoic acid



Cycloheptanoic acid



Other a acids of interest are chaulmoogric acid, norpinic acid, pinic acid, camphoric acid, truxillic acid, etc **a compounds** A compound containing a carbon ring, whose properties are aliphatic rather than aromatic (Bamberger)

alignment chart Nomograph

aliphatic Acyclic Pertaining to an open chain carbon compound, as, paraffins or olefines Cf *aromatic, alicyclic* **a acids** Fatty acids The organic acids derived from the a hydrocarbons See *acids* **a amino group** The NH_2 radical, when attached to a chain **a amino group apparatus** Van Slyke apparatus **a compounds** See *organic* compounds **a hydrocarbon** Any compound of carbon and hydrogen having an open chain, as in the methane, ethylene, or acetylene series See *hydrocarbons, nomenclature,* and *organic compounds*

alipin Alypine

alipite A nickel mineral of uncertain composition, which contains nickel silicates, magnesium and free silica

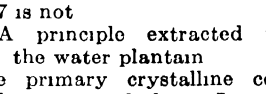
aliquot A divisible part of a whole, *i e*, a part which, when multiplied makes a whole without leaving any remainder, thus 4 is an a of 12 and 20, but 7 is not

alismin A principle extracted from *Alisma plantago* the water plantain

alite The primary crystalline constituent of Portland cement clinker It is also found native, and has the probable formula, $SCaO \cdot SiO_2 \cdot Al_2O_3$ Cf *belite*

alival $C_3H_7O_2I$ = 202 3 Iodopropyleneglycol, 3-iodopropan-1 2-ol, 3-iodo-1 2-dihydroxypropane, $CH_2I\ CHOH\ CH_2OH$ A colorless powder, used medicinally as an iodoform substitute

alizaramide $C_{14}H_9O_3N$ = 239 1 Amidoxyanthraquinone, 1-amino-2-hydroxy-anthraquinone

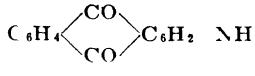


A substance derived from alizarin by heating with ammonia water Brown needles, subliming at 150, insoluble in water, but soluble in alcohol or ether

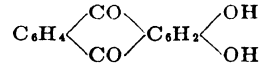
alizarate (1) A derivative of alizarin in which the H of both OH groups is replaced by a metal Cf *lake* (2) Phthalate

alizaric acid Phthalic acid

alizarimide $C_{14}H_7O_2N$ = 221 1 Alizarinimide, 1 2-iminoanthraquinone



alizarin $C_{14}H_8O_4$ = 240 13 Anthraquinonic acid, 1 2-dihydrozyanthraquinone



The reddish coloring matter of *Rubia tinctorum*, dyers' madder It is also synthetically prepared from anthracene and the hydrolysis of ruberythric acid Orange-red crystals, m 290, b 430, insoluble in cold water, but soluble in alcohol or ether It is used in dyeing wool, cotton, and silk and in the manufacture of dyestuffs, also as a reagent and indicator as a 0 5 % alcoholic solution (alkalis—red, acids—yellow) and pH indicator (changing at pH 9 5) **a black** Naphthazarine A black dye, the alizarin of the naphthalene series made by the reduction of α-dinitro-naphthalene It behaves like an alizarin **a blue** $C_{17}H_9O_4N$ = 291 1 Anthracene blue, dihydroxyanthraquinonequinoline Brownish-violet needles of metallic luster, m 270, soluble in alcohol Used as a blue coloring matter and dye and pH indicator (acids—green alkalis—blue) changing at pH 12 **a blue amide** $C_{17}H_{10}O_3N_2$ = 290 1 Amino-hydroxy-anthraquinone quinoline A derivative of alizarin blue in which one —OH group is replaced by a NH_2- group Used as a dye **a bordeaux, a brown** See *a* dyes **a carboxylic acid** $C_{14}H_7O_4COOH$ = 284 14 2-Carboxyl-alizarin Red triclinic crystals, m 305, soluble in water, alcohol, or ether Used in the manufacture of dyestuffs **a carmine** Sodium alizarin sulfonate **a dyes** A group of dyes derived from anthraquinone (see table) They are used as sodium salts of their sulfonic acids and employed largely in the textile industry **a red** Sodium sulfalizarate, alizarin sodium monosulfonate A brown powder, readily soluble in water It is used as an indicator in titrating acids (yellow) and bases (red) and is superior to methyl orange It changes at pH 5 5 **a sulfonate** Any salt of a sulfonic acid **a sulfonic acid** $C_{14}H_7O_4SO_3H$ = 320 1 1 2-Dihydroxy-7-sulfonic-anthraquinone Orange crystals, soluble in water or alcohol, insoluble in ether Used in the manufacture of dyes **a yellow** Sodium p-nitraniline salicylate A 0 1 % aqueous solution, used as pH indicator changing at pH 11 1 from yellow (acid) to purple (basic)

alizarinic acid Phthalic *acid*

alkahest See *alchemy*

alkalamides A group of organic compounds derived from ammonia by replacing two or more hydrogen atoms by acid or basic radicals

alkalescent Slightly alkaline

Alk Abbreviation for (1) alkaloid, (2) alkyl

alkali Essentially a hydroxide of lithium sodium, potassium, rubidium or cesium, but the carbonates of these metals and of ammonia also the amines are often included **mineral-** An inorganic base **vegetable-** An organic base **volatile-** Ammonia

a albuminate A compound of albumin and an alkali metal A water-soluble, alkaline powder used for culture media (cholera and diphtheria bacillus) **a blue** The sodium salt of a triphenylrosaniline sulfonic acid, which is used as pH indicator changing at pH 12 5 from blue (acid) to red (basic) and in dyeing wool **a cell** See *photo-electric* cell **a earth metals** The divalent elements, Ca, Sr, Ba, of the second group in the periodic system **a earths** The oxides of Ca and Ba (lime baryta) **a metals** The monovalent element of the first group of the periodic system Li, Na, K, Rb,

ALIZARIN DYES (ANTHRAQUINONES)

alizarin	1 2-dihydroxy-anthraquinone
quinizarin	1 4-dihydroxy-anthraquinone
anthrarufin	1 5-dihydroxy anthraquinone
chrysazin	1 8-dihydroxy-anthraquinone
hystazarin	2 3-dihydroxy-anthraquinone
anthraflavin	2 6-dihydroxy-anthraquinone
isoanthraflavin	2 7-dihydroxy-anthraquinone
alizarin OR and OG	2-hydroxy-3-nitro-anthraquinone
alizarin RG	1 2 7-trihydroxy-anthraquinone
alizarin SG	1 2 9-trihydroxy-anthraquinone
anthragallol	1 2 3-trihydroxy-anthraquinone
purpurin	1 2 4-trihydroxy-anthraquinone
brilliant bordeaux	1 2 5-trihydroxy-anthraquinone
anthrapurpurin	1 2 9-trihydroxy-anthraquinone
flavopurin	1 2 6-trihydroxy-anthraquinone
quinalizarin	1 2 5 8-tetrahydroxy-anthraquinone
anthrachrysone	1 3 5 7-tetrahydroxy-anthraquinone
alizarin cyanin	1 2 4 5 8-pentahydroxy-anthraquinone
alizarin bordeaux	1 2 5 8-tetrahydroxy-anthraquinone
alizarin brown (anthragallol)	1 2 3-trihydroxy-anthraquinone
alizarin cyanin	1 2 4 5 8-pentahydroxy-anthraquinone
alizarin garnet	1 2-dihydroxy-4-amino-anthraquinone
alizarin maroon	1 2 3-trihydroxy-3-amino-anthraquinone
alizarin orange	2-hydroxy-3-nitro-anthraquinone
rufigallol	1 2 3 6 7 9-hexahydroxy-anthraquinone

Cs All are strongly electro-positive, have a low specific gravity, a low melting point, are silver-white and ductile, and react vigorously with water, liberating hydrogen and forming hydroxides **a metaprotein** A protein cleavage product that is soluble in alkalis **a reaction** Basic reaction See *alkaline* reaction **a series** See *quantum** numbers **a waste** The waste calcium sulfide from the LeBlanc process

lkalimeter An apparatus for the determination of carbon dioxide in carbonates, *e g* , Schrotter's apparatus

lkaline Producing hydroxyl ions in an aqueous solution, as, any base **a reaction** The color changes caused by alkalis, or the hydroxyl ion, as, red litmus turning blue, blue congo red turning red, colorless phenolphthalein turning red (See *indicators*) **a solution** A solution containing more hydroxyl ions than hydrogen ions a solution reacting alkaline (See *hydrogen-ion* concentration) **a tide** The reduced acidity of tissue fluids and urine which follows eating

lkalinity An excess of hydroxyl ions in an aqueous solution, the reverse condition of acidity in which the hydrogen ion concentration is less than the hydroxyl ion concentration See also *bases*, *acidity* and *hydrogen ion*

lkalize To make alkaline or basic Antonym acidify, q v

lkaloid An organic nitrogenous base Many alkaloids are of great medical importance, as, morphine, strychnine, atropine, cocaine, quinine They occur in the animal and vegetable kingdoms, and some have been synthesized

groups (amino-alcohols) **a esters** An organic compound formed by the esterification of an acid with an alcohol containing the amino group

alkanes A group of aliphatic hydrocarbons, C_nH_{2n+2}, of the *methane series*

alkanet Alkanna root The root of *Alkanna tinctoria*, a Boraginaceae Used as a red color for oils or fats

alkanisation The combination of isobutane and butenes from petroleum, in presence of sulfuric acid, to form iso-octane and trimethyl butene

alkannic acid An organic acid extracted by alcohol and ether from alkanet

alkannin $C_{15}H_{14}O_4 = 258\ 19$ Anchusin A red amorphous powder, softening at 100, insoluble in water and soluble in alcohol or acetone Used as color for fats or oils and as an indicator **a extract** Extract alkanet A crude a **a paper** Boettger's paper A filterpaper stained with a and used as test for alkalis (green), carbonates (blue) and acids (red)

alkargen Cacodylic acid

alkarsin A mixture of cacodyl and its oxidation products

alkasal A mixture of aluminum salicylate and potassium acetate

alkasol Alkasal

alkenes A group of aliphatic unsaturated hydrocarbons of the general type, C_nH_{2n}, which contain double bonds, the *ethylene series*, q v

alkenyl A generic term for trivalent aliphatic radicals

alkines A group of aliphatic, unsaturated hydrocarbons of the general type, C_nH_{2n-2}, which contain triple bonds, the *acetylene series*, q v

CHEMICAL CLASSIFICATION OF ALKALOIDS

	Derivatives of	*Example*	*Occurring in*
1	Pyridine	piperine	pepper
		coniine, trigonelline	hemlock
		arecoline, arecaidine	areca-nut
		nicotine	tobacco
2	Pyrrolidine	atropine, hyoscyamine, sparteine	Solanaceae
		cocaine	coca-nut
		pelletierine	pomegranate
3	Quinoline	quinine, cinchonine, quinidine, cinchonidine	cinchona
		strychnine, brucine	nux vomica
4	Isoquinoline	papaverine, morphine, codeine, thebaine	morphium
		narcotine, hydrastine	hydrastis
		corydaline, berberine	corydalis
		laudanosine	opium
5	Purine	caffeine, theobromine, theophylline, xanthine, adenine	coffee, tea, beets, bamboo shoots
6	Glyoxaline	pilocarpine, ergotoxine, ergometrine	jaborandus, ergot
7	Amines	aspargine, leucine	
		muscarine, betaine, sinapine, choline	
8	Glucosides	solanine	
9	Unknown constitution	aconitine, veratrine, yohimbine	

Cf tables for aconite, areca, opium, quinine, solanaceae, spartium and staphisagrine alkaloids

animal- A base derived from animals, as, xanthine, adenine, etc **cadaveric-** A cleavage product of animal tissues which results from putrefaction, as, betaine, muscarine (See *ptomaines*) **putrefactive-** Cadaveric a **vegetable-** An alkaloid obtained from vegetable tissues, such as, roots, stems, leaves, barks and flowers of plants

lkaloidal Pertaining to alkaloids

lkalometry (1) The medication of alkaloids for therapeutic purposes (2) The determination of alkaloids

lkamine Amino alcohol An organic compound containing both the amino and alcohol

alkone A hydrocarbon of the type C_nH_{2n-4} See *hydrocarbon* series

alkoxides A group of organic compounds in which the hydrogen atom of the hydroxyl group is replaced by a metal, as in alcoholates and phenates

alkoxy Any alkyl radical which is attached to the remainder of the molecule by oxygen, hence the monovalent radical RO—, as, methoxy, ethoxy

alkyd resin A group of tacky and adhesive resins made from unsaturated fatty acids (phthalic anhydride) and glycerol Used as bonding materials

alkyl Alphyl, aphyl A monovalent radical derived from an aliphatic hydrocarbon by removal of one hydrogen atom, as methyl-, ethyl-, or propyl- Their general formula is C_nH_{2n+1}— Cf *alkyle, alkylene* **a halide** A compound of the type R Cl **a nitrite** A compound of the type R NO_2 **a oxide** See *ethers* **a sulfide** See *mercaptan*

alkylamine An organic compound containing the —NH_2 group and an unsaturated hydrocarbon

alkylation The substitution of an aliphatic hydrocarbon radical for a hydrogen atom in a cyclic compound, as, the introduction of a side chain into an aromatic compound **acid-** or **hot-** To introduce the alkyl into the amino- or hydroxy- group by heating under pressure with alcohol in presence of mineral acid **basic-** or **cold-** Treatment with alkyl sulfate in the presence of sodium hydroxide

alkylbenzaldoxime A series of compounds derived from benzaldoxime by replacing one hydrogen atom of the aldoxime group by another radical There are four series of isomeric compounds and eight stereoisomers

anti-C-alkylbenzaldoxime	PhCHON—R
syn-C-alkylbenzaldoxime	PhCHON—R
N-alkylbenzaldoxime	PhCHON—R
O-alkylbenzaldoxime	PhCHNO—R

Ph is phenyl, and R a radical The other isomers are derived by exchanging the positions of Ph and R Cf *aldoxime*

alkyle (1) The unsaturated hydrocarbons of the general formula C_nH_{2n+1} (2) Alkylide A compound of a metal (Al, Pb, Hg, Zn, etc) and an alkyl radical, as, tetraethyl lead

alkylene An organic radical derived from an unsaturated aliphatic hydrocarbon, as, ethylene-, propylene- Their general formula is, C_nH_{2n}— **a oxides** (1) Alcohol ethers The aliphatic compounds that contain both the carbinol and ether groups, as, diethyline (2) Epihydrins Alicyclic compounds which are the inner anhydrides (ethers) of glycols, as, ethylene oxide, butylene oxide

alkylhalides Alkylogen A combination of an alkyl and halogen grouping of the type $C_nH_{2n+1}X$

alkylide See *alkyle* (2)

alkylidene A divalent organic radical derived from an aliphatic hydrocarbon, as, ethylidene or propylidene, in which two hydrogen atoms are taken from the same carbon atom Their general formula is C_nH_{2n}—

alkylogens Alkyl halides

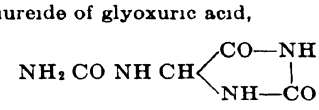
alkyls See (1) *alkyl*, (2) *alkyle*

allanic acid $C_4H_5O_5N_5$ = 203 2 A monobasic crystalline acid obtained by the oxidation of allantoin with nitric acid

allanite Bagrationite Orthite A monoclinic, brown to black, orthite of the zoisite group which resembles epidote, but in which a rare earth metal partly replaces the aluminum and iron d 3 5–4 2 hardness 5 5–6

allantoic acid $C_4H_8O_4N_4$ = 176 2 Dicarbamidoacetic acid, $(NH_2CONH)_2CHCOOH$ A crystalline monobasic acid obtained by boiling allantoin in alkaline solution

allantoin $C_4H_6O_3N_4$ = 158 11 Glyoxyl diureide, *5*-carbamidohydantoin, *5*-ureido hydantoin The diureide of glyoxuric acid,

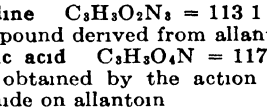


Colorless crystals, m 227 (partial decomp), soluble in hot water It is produced by the oxidation of uric acid and is widely distributed in nature, occurring in the urine of animals and the seeds and roots of plants It hastens epithelial formation

allantoxaidine $C_3H_3O_2N_3$ = 113 1 A crystalline compound derived from allantoxanic acid

allantoxanic acid $C_3H_3O_4N$ = 117 0 Colorless crystals obtained by the action of potassium ferricyanide on allantoin

allanturic acid $C_3H_4O_3N_2$ = 116 1 *5*-Hydroxy-*2 4*-imideazole-dione, glyoxalylurea A pentacyclic and heterocyclic compound obtained by hydrolyzing allantoin,



On reduction it yields hydantoin, which when hydrolyzed, gives hydantoic acid and finally glycine and ammonium carbonate

allelomorph (1) One of a mixture of isomers in a solution which will first separate or crystallize out (2) One of the many character units existing in the germ-plasm of hybrids and which may, consequently, appear in their offspring

allelomorphism Desmotropism

allelotrope A member of a system of two isomeric or desmotropic substances in equilibrium with one another, hence the substance may react according to one or the other molecular structure

allelotropism The phenomenon of two isomeric or desmotropic substances existing in an unstable equilibrium, so that either one or the other rearrangement of the atoms may take place

allemontite $SbAs_3$ A native antimony arsenide, occurring as a rhombohedric, gray or reddish mineral

Allen's test A modification of Fehling's test for sugar in urine

allene Propadiene* **ethyl-** *1 2*-Pentadiene* **methyl-** *1 2*-Butadiene*

allergen Anaphylactin A toxic substance which causes anaphylaxis

allergia The hypersensitivity of an organism toward a later re-injection of the same serum This condition is known as *anaphylaxis*, q v

allergic protein An extract prepared from various vegetable or animal substances, which is used for diagnosis or desensitization, e g pollen extract in hay fever

allergy The hypersusceptibility or increased resistance of an organism to a certain antigen, demonstrable by a local reaction

alligation If two substances when mixed retain their specific values (A and B) of a property, the value for the mixture can be calculated from the equation $\frac{aA + bB}{a + b}$, where a and b are the proportions Cf *additive*

Allihn condenser A condenser in which the condensing surface consists of a series of glass bulbs

Allium A group of liliaceous plants which contain a pungent, volatile oil (allyl sulfide)

Their bulbs are used as a food, condiment and aid to digestion.

A cepa	common onion
A porrum	leek
A sativum	garlic (q v)

allo- Prefix from the Greek "other," and applied to the more stable form of 2 isomers

allochroite A light green to black manganese *garnet*, q v

allochromy A *phosphorescence* or radiation effect, q v, in which the wavelength of the emitted light differs from that of the incident light

allocinnamic acid $C_9H_8O_2 = 148\ 11$ White crystals, d 0 845, b $_{19mm}$125, existing in three allotropic forms, m 42, 58 and 68, respectively

alloclasite A steel-gray mineral, which consists of the sulfides of cobalt, bismuth and arsenic with some iron It is similar to glaucodot

allocyanine Neocyanine

alloisomerism Stereo-isomerism

allomaleic acid Fumaric acid

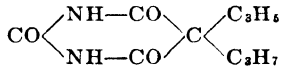
allomerism A similarity of crystalline form with a difference of chemical composition, as, $KClO_4$ and $KMnO_4$

allomerization The dehydrogenation of chlorophyll in alcoholic solution by the action of atmospheric oxygen, which occurs on standing

allomorphism A similarity of chemical composition but a difference in crystalline form, especially of minerals, as $CaCO_3$ in calcite and aragonite

allomucic $C_6H_{10}O_8 = 200\ 1$ The optically inactive dibasic acid, $HOOC(CHOH)_4COOH$, derived from *d*- and *l*- allose, m 166–171, soluble in hot water or alcohol

allonal $C_{16}H_{14}O_3N_2 = 210\ 12$ Registered trade mark for 5-allyl-5-isopropylbarbiturate of phenyldimethyl-dimethylamino pyrazolon



Used as a soporific Cf *barbital*

allo-palladium See *palladium*

allophanamide Biuret

allophane An amorphous native hydrated calcium silicate

allophanic acid $C_2H_4O_3N_2 = 104\ 1$ Ureacarbonic acid, carbamyl carbamic acid NH_2-CO NH COOH A hypothetical acid known as its esters, ethyl allophanate, EtOOC NH CO-NH_2 **a amide** Biuret

allose $C_6H_{12}O_6 = 180\ 15$ A synthetic hexose, isomeric with glucose

allotelluric acid See *telluric* acid (anhydrous)

allotoxin A substance formed by living tissue, which tends to counteract the harmful effect of bacterial toxins on an organism

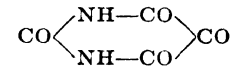
allotrope One of two or more isomeric forms of an element, as, red and white phosphorus

allotropic Occurring in two or more isomeric forms, *e g*, carbon as graphite, diamond, or charcoal **a modification** Allotrope

allotropism Allotropy

allotropy Allotropism A change in the properties of an element without a change of state, q v, isomerism of a chemical element which occurs in different amorphous and crystalline forms, as, with sulfur, phosphorus or carbon Cf *monotropy*, *pseudomonotropy* **dynamic-** Tautomerism

alloxan $C_4H_2O_4N_2 = 142\ 1$ Mesoxyalylurea, hexahydrotetraketo pyrimidine, pyrimidinetetrone, the "erythric acid" of Brugnatelli



It occurs in two crystalline forms with 1 mol H_2O as small colorless crystals, and with 4 mol H_2O as large, colorless, efflorescent prisms It decomposes at about 170, and is soluble in water or alcohol It appears in the intestinal mucus during diarrhea If bottled it sometimes explodes **oxime-** Violuric acid

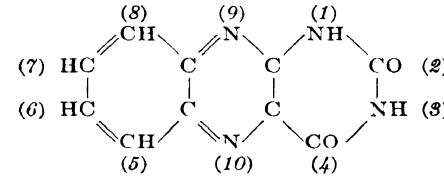
alloxanic acid $C_4H_4O_5N_2 = 160\ 1$ Tetrahydro-*4*-hydroxy-*2 5*-diketo-*4*-imidazole-carboxylic acid The compound, NH_2 CO NH CO CO-COOH or its ring form

Colorless crystals obtained from alloxan by treatment with alkalis They decompose if heated

alloxanthin Alloxantin

alloxantin $C_8H_4O_7N_4 = 286\ 2$ A purine base occurring in colorless, small prisms, or rhombic crystals, soluble in water, alcohol or ether **tetramethyl-** Amalinic acid

alloxazin $C_{10}H_6N_4O = 214\ 12$ The heterocyclic compound



which occurs in some plant pigments **iso-** Flavin

alloxuric bodies Purine bases

alloy A mixture of two or more metallic elements (or non-metals, as C, Te, P) which has a metallic appearance and which is either

1 A molecular mixture, microscopically homogeneous, as,

(*a*) a solid solution of A-in-B or B-in-A, in which case the properties are intermediate between those of A and B, or

(*b*) a metallic compound, A_xB_y, with properties differing from A and B, or

(*c*) a combination of (*a*) and (*b*), as A-in-A_xB_y

2 A colloidal mixture, microscopically heterogeneous, as, two or more phases, [—], consisting of crystals

(*d*) of metallic elements, [A] + [B]

(*e*) of metallic compounds, [A_xB_y] + [AB_z]

(*f*) of solid solutions [A-in-B] + [B-in-A]

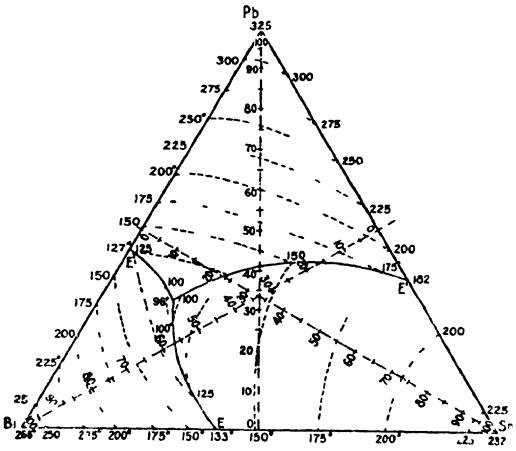
(*g*) of combinations of *d*, *e*, and *f*, as, [A] + [A_xB_y] + [A-in-B], etc

Generally the fusing point of an alloy is lower than the fusing point of its highest-melting constituent, in some cases it is lower than that of any or all constituents Each set of metals has its own particular system, (see *diagram*), and with 3 metallic elements, there are possible

666	binary systems (two components)
7770	ternary systems (three components)
66054	quarternary systems (four components)

See *steel* and each metallic element

antifriction- A. which are sufficiently plastic to fit themselves to the shape of a shaft They contain generally, tin or lead alloyed with copper or antimony **coinage-** A used for coins Cf *gold* a , *silver* a **eutectic-** An a which has the



Alloys of Pb, Bi and Sn (Molinari) Showing the fusing points of a ternary system (for explanation of this graph see *diagram*)

lowest constant melting point, *i e* , whose constituents are present in such proportions that it solidifies completely at the *eutectic* temperature, q v **fusible** Low-fusing a **heavy-** An a of 90 % W, 7 5 % Ni and 2 5 % Cu It has a high density (16 5–17 0 grm /cc), a tensile strength equal to that of steel, and good machining properties **Heussler's** A group of magnetic a which do not contain iron but metals which are separately nonmagnetic, as, 60 pts Cu, 20 pts Mn and 14 pts Al **light-** An alloy containing aluminum as distinct from magnesium Cf *ultra-light* a **low-** An alloy containing a large proportion of one constituent **low-fusing-** Fusible a An a melting below the m of tin The lowest melting a (15°C) consists of 88 % Ga and 12 % Sn Others are Newton's 8 Bi, 5 Pb, 3 Sn (m 94°C), Lipowitz' 5 Bi, 2 7 Pb, 1 3 Sn, 1 0 Cd (m 65°C) Cf *D'Arcet* metal a , *Wood's* a , *Rose* metal **master-** An alloy containing a known amount of a particular metal, which is used instead of the pure metal for making up finished alloys **mercury-** Amalgam **pyrophoric-** Iron-cerium alloys which spark when rubbed with a coarse file **ultra-light-** An alloy containing magnesium, as distinct from aluminum Cf *light* a

alloying To produce an alloy by fusing metals together

allspice Pimenta

allulose $C_6H_{12}O_6$ = 180 0 d-Ribo-2-ketoheose, d-pseudo-fructose, d-psicose $CH_2OH\ CO\cdot(CHOH)_3\ CH_2OH$, an epimer of d-fructose A reducing, non-fermentable constituent of cane sugar molasses, cf *glutose*

alluvium The deposit of sand, earth etc , carried down by a river

allyl The monovalent radical, $—C_3H_5$, which contains a double bond, α- or Δ^2- $—CH_2\cdot CH\ CH_2$, β- or Δ^1-iso-, (propenyl), $—C(CH_3)\ CH_2$ γ- or Δ^1-, (isopropenyl) $—CH\ CH\ CH_3$ **a acetate** $C_5H_8O_2$ = 100 09 The ester, $MeCOOC_3H_5$ A colorless liquid, d 0 938, b 103, slightly soluble in water and miscible with alcohol or ether **a acetic acid** $C_5H_8O_2$ = 100 09 The monobasic acid $C_3H_5\ CH_2\ COOH$ A colorless liquid, d 0 984, b 187, slightly soluble in water, and miscible with alcohol or ether **a acetone** $C_3H_5\ CH_2\cdot CO\ CH_3$ = 98 11 *5*-Henene-*2*-one* A colorless liquid, $d_{27°}$ 0 834, b 129, insoluble in water **a acetonitrile** $C_3H_5CH_2CN$ = 81 09 A colorless liquid, d 1 184, b 140, insoluble in water **a alcohol** $CH_2\ CH\ CH_2OH$ = 58 06 Propenol, propenyl alcohol, *-2-*propen-*1-*ol* A colorless liquid, d 0 849, m —129, b 96, insoluble in water and miscible with alcohol or ether Used in organic synthesis, in chemical warfare, and as antiseptic in 0 5 % solution **a aldehyde** Acrolein **a amine** $CH_2\ CH\cdot CH_2NH_2$ = 57 08 *2*-Propenylamine* A yellowish, oily liquid, d 0 761, b 53 2, miscible with water, alcohol or ether It is prepared from mustard oil (*methyl-*) $C_3H_5\ NH\ CH_3$ = 71 10 A colorless liquid, b 65, miscible with water, alcohol or ether (*phenyl-*) Allyl aniline **a aniline** $C_3H_5\ NH\ C_6H_5$ = 133 14 Phenyl allyl-amine A colorless liquid, d 0 982 b 208, slightly soluble in water and soluble in alcohol **a benzene** $CH_3\ CH\ CH\ C_6H_5$ = 118 13 **n-,** Phenyl propine, phenyl allylene A colorless liquid, d 0 914, b 160, soluble in alcohol *iso-* Benzylethylene $BzCH\ CH_2$ A colorless liquid, d 0 909, b 155 **a benzoate** $C_6H_5\cdot COOC_3H_5$ = 162 13 A colorless liquid d 1 059, b 228 **a bromide** $CH_2\ CH\ CH_2Br$ = 120 98 Bromallylene, γ-monobromopropylene, 3-bromo-1-propine, 3-bromopropene* A colorless liquid, d 1 436, b 70 5, insoluble in water and miscible with alcohol or ether **a butyrate** $CH_3(CH_2)_2COOC_3H_5$ = 128 13 A colorless liquid, b 142, miscible with alcohol **a carbinol** $CH_2\ CH\ CH_2\ CH_2\ OH$ = 72 1 A colorless liquid *methyl-* $CH_2\ CH\ CH_2\ CH(OH)CH_3$ = 86 11 A colorless liquid, $d_{20°}$ 0 834, b 115 soluble in 8 pts water and miscible with alcohol or ether **a chloride** $CH_2\ CH\ CH_2Cl$ = 76 52 Chlorallylene, *3*-chloropropene*, α-monochlorpropylene A colorless liquid, d 0 937, b 46, insoluble in water and miscible with alcohol or ether **a cinnamate** $C_6H_5\ CH\ CH\ COO\cdot C_3H_5$ = 188 16 Colorless crystals, $d_{20°}$ 1 052, b 285, insoluble in water and soluble in alcohol or ether **a cyanamide** Sinamin **a cyanide** C_4H_5N = 67 07 *3*-Butanenitrile*, vinylacetonitrile, β-butenonitrile, $CH_2\ CH\ CH_2CN$ A colorless liquid, d 0 835, b 119, soluble in alcohol or ether **a disulfide** $C_3H_5\ S\ S\ C_3H_5$ = 146 02 Colorless liquid, d 0 9, b 138, it occurs in garlic **a ether** $C_6H_{10}O$ = 98 11 Diallyloxide, *3*-(2-propenoxy)propene* $(CH_2\ CH\ CH_2)_2O$ A colorless liquid, $d_{15°}$ 0 805, b 94 3, slightly soluble in water and miscible with alcohol or ether *methyl-* $CH_2\ CH\ CH_2\cdot O\ CH_3$ = 72 08 A colorless liquid, d 0 773 b 46, slightly soluble in water, and miscible with alcohol or ether **a ethyl ether.** $C_6H_{10}O$ = 86 11 The mixed ether $C_3H_5\ O\ C_2H_5$ A colorless liquid, b 64 **a fluoride** $CH_2\ CH\cdot CH_2F$ = 60 04 *3*-Fluoropropene* Colorless gas, b —10, slightly soluble in water **a formate** $HCOOC_3H_5$ = 86 07 A colorless liquid, d 0 932, b 82, insoluble in water and soluble in alcohol **a iodide** $CH_2\ CH\ CH_2I$ = 167 98 *3*-Iodopropene* A yellow liquid, $d_{18°}$ 1 890, b 101, insoluble in water, and miscible with alcohol or ether **a isoamyl**

ether $C_8H_{16}O$ = 128 17 **Allyl-i-amyl oxide** $C_3H_5O C_5H_{11}$ A colorless liquid, b 120, slightly soluble in water and miscible with alcohol or ether **a isocyanide** CH_2 CH CH_2-NC = 67 07 A colorless liquid, $d_{17°}$ 0 794, b 100, slightly soluble in water and miscible with alcohol or ether **a isothiocyanate a mustard oil a malonic acid** $C_6H_8O_4$ = 144 09 The compound C_3H_5 CH $(COOH)_2$ Colorless crystals, m 103, (decomp), and soluble in water, alcohol or ether **a mercaptan** CH_2 CH CH_2SH = 74 12 Allyl sulfhydrate, *2*-propene-*2*-thiol* A slightly yellow liquid, b 90, miscible with alcohol or ether **a mustard oil** CH_2 CH CH_2NCS = 99 13 A isosulfocyanic ester, a isothiocyanate, a thiocarbimide A colorless liquid, $d_{10°}$ 1 017, b 151, slightly soluble in water and miscible with alcohol or ether It occurs in mustard seeds (*Sinapis nigra*) as *potassium* myronate, q v , combined in the form of glucoside, and in horseradish Used as a vesicant poison gas **a oxalate** $(COOC_3H_5)_2$ = 170 12 A colorless liquid, d 1 055, b 217, insoluble in water, soluble in alcohol **a phenyl cinchonine ester** Antiquinol **a phenyl ether** $C_6H_5O C_3H_5$ = 134 13 A colorless liquid, d 0 986, b 192, insoluble in water **a phenylmethyl ether** Anethol **a phenyl urea** $C_{10}H_{12}ON_2$ = 176 16 The urea derivative Ph NH CO NH C_3H_5 Colorless crystals, m 115 **a pyridine** $C_5H_4N C_3H_5$ = 119 12 A colorless liquid, $d_{0°}$ 0 959, b 190 **a pyrocatechol methylene ester** Safrol **a sulfhydrate** a mercaptan **a sulfide** $(C_3H_5)S$ = 114 17 Thioallyl ether, a thioether, *3*-(*2*-propenylthio)-propene*, *2*-propenylsulfide*, diallyl sulfide A colorless or slightly yellowish liquid, $d_{27°}$ 0 888, b 138, slightly soluble in water and miscible with alcohol or ether It is a constituent of garlic, and is used hypodermically in tuberculosis and cholera **a sulfocarbamide** $C_3H_5NH CS NH_2$ = 116 16 Thiosinamine, rhodalline, a thiourea a sulfourea Colorless monoclinic crystals of slight garlic-like odor, m 74, soluble in water, alcohol, or ether Used medicinally in the treatment of scar tissue, in photography, and as a reagent in the analysis of feces (Cf *a* mustard oil) **a sulfocyanide** CH_2 CH CH SCN = 99 13 a thiocyanate A colorless liquid, d 1 056, b 161, insoluble in water **a sulfourea** a sulfocarbamide **a thiocarbimide** a mustard oil **a thiocyanate** a sulfocyanide **a -i-thiocyanate** a mustard oil **a thioether** a sulfide **a thiourea** a sulfocarbamide **a tribromide** $C_3H_5Br_3$ = 280 9 Tribromallylene, *1 2 3*-tribromopropane*, tribromopropylene, propargyltribromide, tribromhydrin, CH_2Br-CHBr CH_2Br Colorless crystals, or oil, d 2 436, m 18, b 219, soluble in alcohol or ether Used as an antispasmodic and sedative in hysteria, asthma and whooping cough **a trisulfide** $(C_3H_5)_2S_3$ = 178 26 Diallyl trisulfide Colorless liquid, d 1 085, b 140, insoluble in water

allylene CH_3C CH = 40 05 Propyne*, propine, methyl acetylene A colorless gas, m −110, b −23 5, and soluble in ether Cf *propadiene* **dimethyl-** Methyl butine **methyl-** Butine **phenyl-** See *phenylmethyl* acetylene

a dichloride $C_3H_4Cl_2$ = 110 97 *1 2*-Dichloropropene* The compound CH_3CCl-CHCl A liquid, $d_{27°}$ 1 23, b 55 **a oxide** $(CH_3C$ $CH)_2O$ = 56 05 *1 2*-Epoxypropene* A colorless liquid, b 62, slightly soluble in water

allylin $C_6H_{12}O_3$ = 132 1 Allyloxy-glycerol The compound CH_2 CH $CH_2O CH_2CHO$-H CH_2OH A heavy liquid, b 230, formed on heating glycerol with oxalic acid

almadina Euphorbia gum

almandine Almandite

almandite (1) Almandine $Fe_3Al_2Si_3O_{12}$ An isometric, reddish-brown to black garnet, d 3 9–4 2 Mol W 499 1, Mol Vol 118 0, used as a gem (2) A violet variety of *spinel*, q v

Almen test The detection of carbohydrates by the reduction of alkaline bismuth ions

almond The dried ripe seeds of *Prunus amygdalus* (*communis*), a Rosaceae of Southern Europe and California, 2 varieties **bitter-** the seeds of variety *amara*, used in the manufacture of a oil, amygdalin and for flavoring, **sweet-** the seeds of variety *dulcis*, used in the manufacture of oil

a cake The crude remains of a after the expression of oil, used for a meal **a camphor** Benzoin **a furnace** A remelting furnace of the *reverberatory* type, q v **a meal** The residue remaining after the expression of oil from almonds It is used in cosmetics cooking, confectionery and as a perfume base **a oil, (artificial-)** Benzaldehyde **(artificial bitter-)** Nitrobenzene **(bitter-)** An oil obtained from bitter a by macerating with water and distilling A colorless liquid, d 1 045–1 060, b 180, soluble in water, alcohol, or ether Used for flavoring **(sweet-)** An oil obtained by expressing sweet a A yellow liquid, d 0 915–0 920, soluble, in alcohol, ether, chloroform or benzene Used as a perfume, and as a lubricant for delicate mechanisms such as watches **bitter almond water** A solution containing hydrocyanic acid, ammonium cyanide and mandelic acid nitrile

alneon An alloy of aluminum with zinc (10–20 %) and small amounts of copper and nickel, Used for castings

alnuoid An extract from the bark of *Alnus serrulata* or American alder Used as a tonic

Alnus Alnus bark The bark of the American alder, *A serrulata*, a Betulaceae, which contains tannic acid, used as astringent

alochrysine $C_{15}H_8O_7$ = 268 1 A decomposition product of barbaloin obtained by oxidation with chromic acid mixture

aloe (1) A genus of liliaceous plants, the juices are the aloes of commerce and the fibres are used for cords and nets (2) An extremely bitter, black, shining resin from the juice of the leaves of several aloe species Used medicinally as a cathartic **American-** Agave **Barbados-** The resin from *Aloe vulgaris* of Jamaica and Barbados **Cape-** The resin from *Aloe ferox* and other species of South Africa Used in the manufacture of a brown dye **hepatic-** The resin from *Aloe chinensis* and other species from the Dutch Indies **Socotrine-** The resin from *Aloe perryi* from Socotra

a emodin $C_{15}H_{10}O_5$ = 270 1 A crystalline constituent of all aloes which is also found in cascara sagrada, frangula and senna leaves Yellowish crystals, m 224 Used medicinally as a cathartic

aloeresic acid $C_{30}H_{32}O_{14}$ = 616 3 A yellowish-brown, micro-crystalline powder obtained from Cape aloes

)e-wood. Eagle wood, lignum, aloe. A fragrant resinous heart-wood from *Aquilaria agallocha*, a tree of tropical Asia. Used by the Chinese as a tonic, stimulant and diuretic, and as a constituent of incense and perfumery.

)etic acid. $C_{14}H_4O_{10}N_4$ = 388.2. Tetranitroanthraquinone. An orange-red amorphous powder obtained by treating aloin with nitric acid.

)in. $C_{20}H_{18}O_9$ = 402.14. A neutral, bitter principle of aloes. Yellow, prismatic needles, m.147, soluble in water, alcohol or bases. It is considered to be the strong purgative glucoside of aloes and is named according to its origin: barbaloin, nataloin, socaloin or zanaloin.

)nigrin. $C_{22}H_{18}O_8$ = 410.2. An amorphous principle obtained from Barbados aloes.

)xite. An artificial aluminum oxide made by fusing bauxite in an electric furnace. It forms white to dark red crystalline masses which are used as abrasives, filters, and refractories (see *alundum*).

paca. The long, silky, lustrous wool from the alpaca, a type of llama (Auchenia paco).

pax. A light aluminum-silicon eutectic alloy which contains 13 % Si. It is used for moulded articles, as it has a low shrinkage when quenched.

pha. α = The first letter of the Greek alphabet.

a. acid. 2.8-Naphthylamine sulfonic acid. **a. derivatives.** (1) Substitution products of straight chain compounds in which the substituting atom or radical is attached to the carbon atom to which the principal group is also attached; *e.g.*, α-hydroxy propionic acid: $CH_3.CHOH.COOH$. (2) A substitution product of a polycyclic compound, in which the substituting atoms or radicals are attached to the carbon atom which is closest to the carbon atom shared by both rings; *e.g.*, in naphthalene, the 1, 4, 5, or 8 position. (3) Substitution products of heterocyclic compounds in which the substituting atom or radical is attached to the carbon atom which is closest to the heterocyclic atom; *e.g.*, in pyridine the 2, or 6 position. (4) The first of a series of derivatives to be discovered. This usage has no logical structural significance. (5) An even rotational quantum number; as,

α-hydrogen (or para-H)	0.2.4...
β-hydrogen (or ortho-H)	1.3.5...

(6) A stereoisomer of a sugar; as, α-glucoside. *Note.* For compounds beginning with alpha see under the main heading; thus for alphanaphthol see *α-naphthol*. **a. particles.** Positively-charged helium nuclei emitted from radio-active substances with a speed of 20,000 miles/second. (1.922×10^9 cm./sec.). They have a mass equal to that of a helium atom; when their charge is neutralized by the capture of two negative electrons, they form helium atoms. Cf. *alphatopic* change. **a. position.** See a. derivatives. **a. rays.** a particles.

phatopic. Pertaining to 2 radioactive elements or isotopes which differ by an alpha particle and an atomic weight of 4.00. **a. change.** The spontaneous disintegration of certain radio-active elements in which an alpha particle is emitted and the element, thereby, changes its position in the periodic table by moving two places lower. See *radio-active* elements.

phazurine. An indicator changing at pH 6.0 from purple (acid) to green (alkaline), used for improving the end-point of methyl red.

alphol. $C_{17}H_{12}O_3$ = 264.09. α-naphthyl salicylate. A white powder, m.83, insoluble in water; used medicinally. Cf. *betol*.

alphozone. A brand of succinic peroxide.

alphyl. Alkyl-phenyl. A radical having both aromatic and aliphatic structures; as, benzyl, phenylhexyl-, etc. Cf. *aralkyl*.

alpinin. $C_{17}H_{12}O_6$ = 312.1. A crystalline constituent of galangal, the rhizome of *Alpinia officinarum* (Zingiberaceae).

alquifou. Potters' lead. Black lead ore. A mineral zinc sulfide used to produce a green glaze on pottery.

Alsace gum. Dextrin.

alsol. Aluminum acetotartrate.

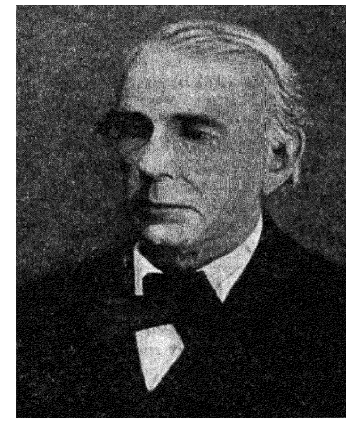
Alsop drying oven. A steam-chamber for holding crystallizing dishes, devised specially for tanning laboratories.

Alstonia. A genus of Apocynaceae of India and Malaya which yield *dita* bark, q.v.

alstonine. $C_{21}H_{20}N_2O_4.3\frac{1}{2}H_2O$ = 427.4. Chlorogenine. An alkaloid from the bark of *Alstonia constricta*, an Apocynaceae of Asia. Colorless crystals, m.195; insoluble in water, soluble in alcohol or ether. It is used as an antipyretic and antiperiotic. Cf. ditaine, porphyrine.

alstonite. Neotype. Baryto-calcite. Bromlite. The mineral $BaCO_3,CaCO_3$.

altaite. PbTe. A native lead telluride, a rare mineral occurring in tin ores as white isometric crystals. It is found in the Altai mountains of Central Asia.



David Alter.

Alter, David. 1807–1881. An American physician noted as the discoverer of spectrum analysis (1854).

alterative. A drug which stimulates the nutritive functions of the body without exerting an obvious influence upon any particular organ.

alternating current. A.C. An electric, pulsating current, in which the direction of the flow is rapidly changed so that a terminal becomes in rapid succession positive then negative. Cf. *alternator*, *commutator*, *rectifier*. **pure-** An A.C. which is constant in frequency and output, and which gives a correct sine-wave curve. It is obtained by the use of a double mercury-arc oscillator.

alternation. A series of changes following each other periodically or in turn. **a. of generations.**

The successive change from asexual to sexua reproduction and back again a biological phenomenon observed in some lower forms of animals and plants (*e g*, mosses, ascidians) **a law** The arc spectra of the elements have alternately odd and even multiplicities when passing from the first to the higher groups of the periodic table **a rule** Pauli's principle

alternator A dynamo with a large number of poles producing 120 or more alternations or cycles of current per second

althea althæa Marshmallow, hollyhock, q v The dried roots, flowers and leaves of *Altheae officinalis*, a Malvaceae Used medicinally as an emollient and demulcent

altheine Asparginc

althionic acid Ethylsulfuric acid

altimeter An instrument for measuring the heights of objects, *e g*, trees, buildings, hills

altiscope Periscope

altitude The vertical elevation above any given point, cf *co-ordinates*, in particular the height or distance above sea level **a gage** A barometer used for determining altitude

altrose $C_6H_{12}O_6$ = 180 10 A hexose that is isomeric with glucose, talose and allose

alucol A colloidal aluminum hydroxide used as antacid

aludel A pear-shaped vessel open at both ends, used to connect other vessels **a furnace** A furnace used for the reduction of mercurial ores

alum (1) A generic name for a group of double salts of the general formula $M_2'SO_4,M_2'''(SO_4)_3\,24H_2O$, or $M'M'''(SO_4)_2\,12H_2O$ M' is monovalent and may be Na, K, Rb, Cs NH_4, Tl, Ag, hydroxylamine, or the radical of an organic quarternary base, (*e g* NMe_4) M''' is trivalent and may be Fe, Cr, Al, Mn, In, Tl, Ga V, Co, Ti, Rh etc SeO_4 or TeO_4 may replace SO_4 (2) A name applied to double salts of aluminum sulphate and the sulphate of a monovalent metal (M'), hence $M_2'SO_4,Al_2(SO_4)_3\,24H_2O$ (3) The original name of ammonium alum, $(NH_4)_2SO_4\,Al_2(SO_4)_3\,24H_2O$ See also pseudo*alum* (4) Erroneously applied to aluminum sulfate, as, papermaker's a (5) Generally applied to potassium aluminum sulfate **ammonium-** Ammonium aluminum sulfate **ammonium chrome-** Ammonium chromic sulfate **ammonium iron-** Ferri ammonium sulfate **burnt-** Aluminum potassium sulfate, calcined at 200° so as to lose its water **cesium-** Aluminum cesium sulfate **chrome-** Sodium chromic sulfate **common-** Aluminum potassium sulfate **copper-** Cupric aluminate **iron-** A native ferric potassium sulfate **manganese-** Manganous ammonium sulfate **neutral-** Alunite **official-** Either ammonium (U S P) or potassium (B P) alum **pearl-** A specially-prepared alum for paper manufacture **pickle-** An alum prepared for canneries, packers, etc **porous-** Aluminum sodium sulfate **potassium-** Aluminum potassium sulfate **potassium chrome-** Chromic potassium sulfate **potassium manganese** Potassium manganic sulfate **pseudo-** Alums containing a divalent in place of the univalent metallic sulphate, as $MnSO_4\text{-}Al_2(SO_4)_3\,24H_2O$ They are not isomorphous with the alums **roman-** A native aluminum and iron sulfate from Tolfar, Italy **rubidium-** Aluminum rubidium sulfate **sodium-** Aluminum sodium sulfate **thallium-** Aluminum thallium sulfate **true-** a containing aluminum **a flour** Aluminum potassium sulfate **a hematoxylin solution** A staining solution containing 1 pt hematoxylin, 100 pts saturated aqueous solution of ammonium alum, 0 5 pt thymol and 300 pts water **a meal** Aluminum potassium sulfate **a root** The root of *Heuchera americana*, which contains gallic and tannic acids and is used as an astringent **a shale** A clay containing iron pyrites and aluminum silicate It is the source of ammonium alum **a stone** Alunite

alumel An alloy of 94 % Ni, 2 % Al, 2 5 % Mn, 1 % Si and 0 5 % Fe, used in thermocouples

alumian $Al_2O(SO_4)_2$ A white, native, basic aluminum sulfate

alumina Aluminum oxide, Al_2O_3 α-Corundum **ferric-** A colloidal solution of $Al(OH)_3$ and $FeCl_3$, used as a coagulant in water purification **lime-** Essonite **natural-** Corundum Cf *ruby*, *sapphire* **a cream** The hydroxides of aluminum It is a clarifying agent, used in optical experiments **a mordants** A fixing agent used in dyeing, usually aluminum sulfate, alums, sodium aluminate or aluminum acetate **a white** Soluble alumina, transparent alumina, alumina hydrate A form of aluminum hydroxide used as a white pigment in paints and inks

aluminate (1) *ortho-* A salt of *aluminic* acid, q v, or a compound of the type M_3AlO_3, (derived from $Al(OH)_3$), as, Na_3AlO_3, sodium aluminate (2) *meta-* Salts of the type $MAlO_2$ which exist only in solution, as AlO_2^- ion (3) A combination of Al_2O_3 with a metallic oxide, as, $MgAl_2O_4$, spinel

aluminic acid H_3AlO_3 A tautomeric form of aluminum hydroxide, $Al(OH)_3 \rightleftharpoons H_3AlO_3$ Aluminum hydroxide reacts as acid toward an alkaline solution

aluminiferous A rock yielding or containing aluminum

aluminite $Al_2(SO_4)(OH)_4\,7H_2O$ A native, soft, white hydrous aluminum sulfate occurring in monoclinic crystals Cf *websterite*

aluminium Aluminum

alumino-ferric A mixture of aluminum sulphate and a ferrous salt, used in the coagulation of sewage

aluminon $C_{22}H_{23}N_3O_9$ = 473 5 The dye, aurine tricarboxylic acid used as a test for the aluminum ion with which it gives a bright red lake It will detect 10^{-5} moles

aluminothermy A method of using finely powdered aluminum mixed with a metal-oxide and ignited by a cartridge, for the reduction of a metal oxide to metal or for obtaining a high temperature (See *e g*, *thermite* and thermite process of welding)

aluminum Al = 26 96 Aluminium An earth metal and element of atomic number 13 It is one of the most abundant metals, and was isolated by Wohler (1817) from sodium and $AlCl_3$ A silver-white light, ductile metal, $d_{20°}$ 2 70, m 658 5, b 1800, soluble in acids or alkalis It is readily oxidized and covered with a fine film of resistant aluminum oxide which prevents further oxidation Finely-powdered aluminum mixed with iron oxide and ignited with a magnesium ribbon will react violently and produce a temperature of about 3000°C, in which the iron melts and can be used for welding (*thermite*) Because of its lightness and resistance aluminum is used extensively for cooking utensils, airships, aeroplanes, boats,

automobiles Aluminum foil is used as a substitute for silver foil in the printing and glass industry Aluminum alloys with practically every other metal, and many of these alloys are of great importance, as, *magnalium*, *electron*, *duralumin* etc Aluminum has a valency of three and forms only one series of compounds Aluminates are derived from aluminum hydroxide in which the aluminum has a valency of three Its ions and compounds are

aluminum ion	Al^{+++}
ortho-aluminate ion	AlO_3'''
meta-aluminate ion	AlO_2'
alums	$M_2'Al_2(SO_4)_4 24H_2O$

a acetate $(CH_3COO)_3Al$ = 204 17 Normal acetate of alumina An amorphous white powder that decomposes when heated and is soluble in water (*-solution*) A 5 % aqueous solution used medicinally as a gargle, astringent or antiseptic **a acetate, basic** $Al(C_2H_3O_2)_2OH$ = 162 1 A white, crystalline powder, used as a mordant and disinfectant and also in embalming fluids **a aceto-glycerinate** A white powder, used as an antiseptic **a aceto-tartrate** Aluminum aceto-tartrate, also, $AlC_2H_3O_2C_4H_4O_6$ White crystals, soluble in water but insoluble in alcohol or ether A 50 % solution is used as a disinfectant and antiseptic **a ammonium sulfate** $Al_2(NH_4)_2(SO_4)_4 24H_2O$ = 906 Ammonium alum **a alkyls** A group of compounds of aluminum and alkyl radicals, *e g*, aluminum trimethyl, aluminum triethyl **a alloys** Alloys of aluminum and other metals, as, aldrey, alnon alpax, duralium, electron, magnalium, partinium, rominium, skleron, etc The melting points of some alloys (in °C) are

With	90 % Al 10 %	80 % Al 20 %	70 % Al 30 %	60 % Al 40 %	50 % Al 50 %
Ag	625	615	600	590	580
Au	675	740	800	855	915
Cu	630	600	560	540	580
Fe	860	1015	1110	1145	1145
Sb	750	840	925	945	950
Sn	645	635	625	620	605

a arsenate $AlAsO_4$ = 166 02 A white powder, insoluble in water but soluble in acids **a benzoate** $Al(C_7H_5O_2)_3$ = 390 15 A white crystalline powder, slightly soluble in water **a beta naphthol sulfonate** Alumnol **a bifluoride** $(Al_2F_6)_3(HF)_4 10H_2O$ Aluminum acid fluoride A white crystalline powder, slightly soluble in water **a borate** $2Al_2O_3 B_2O_3 3H_2O$ = 338 4 A granular, white powder which is soluble in water, used in the glass and porcelain industry **a boroformate** $Al_2O_3B(OH)_3H_2CO_3 \cdot 5H_2O$ = 316 2 Transparent white crystals, soluble in water or dilute alcohol, used as an antiseptic, astringent and disinfectant, in gargles **a borotannate** Cutal, lutol A brownish powder, used as a disinfecting dusting powder **a borotartrate** Boral Colorless crystals, soluble in water and used as an astringent **a bromate** $Al(BrO_3)_3 9H_2O$ = 573 00 Colorless hygroscopic crystals, m 62 3 which decomp at 100, soluble in water **a bromide** $AlBr_3 6H_2O$ = 374 96 Colorless or slightly yellow hygroscopic crystals, m 93, b 165, d 2 54, soluble in water, alcohol or carbon disulfide It is used in organic syntheses *anhydrous-* $AlBr_3$ = 266 86 Yellowish scales that fume in air, used in organic syntheses **a bronze** An alloy of 90 pts copper, 10 pts aluminum, d 7 6, m 1050 **a butoxide** $Al(OC_4H_9)_3$ = 246 18 A white powder, d 1 025, m 102, b 284 5, decomp in water **a carbide** Al_4C_3 = 144 4 Yellow hexagonal crystals, d 2 36 which decomp with water and form methane, CH_4, used for generating methane **a chloride** $AlCl_3 6H_2O$ = 231 54 Colorless crystals, soluble in water, alcohol or ether *anhydrous-* $AlCl_3$ = 133 48 Yellow crystalline masses, m 180, soluble in water, chloroform, carbon disulfide, ether, or carbon tetrachloride It is used in organic synthesis (Friedel-Craft reaction), medicinally in locomotor ataxia, industrially as a catalytic agent and in refining petroleum, and as a reagent for naphthalene **a carbonate** $Al_2(CO_3)_3$ = 234 2 Chalk-like, brittle, white lumps, insoluble in water, and used as a mild antiseptic **a caseinate** A yellowish-white, tasteless powder, insoluble in water **a cesium sulfate** $AlCs(SO_4)_2 12H_2O$ = 568 2 Cesium alum Colorless crystals d 2 115, m 117, slightly soluble in water **a dichromate** $Al_2(Cr_2O_7)_3$ = 702 2 Red crystals which are soluble in water **a dish** (1) A flat, shallow vessel of aluminum, used in milk analysis (*2*) A deep, hollow container of aluminum used for weighing powders **a ethoxide** $Al(OC_2H_5)_3$ = 162 09 Triethoxyaluminum White powder, d 1 142, m 134, b 205, soluble in hot water or alcohol, used as a reagent for water **a ethyl** $Al(C_2H_5)_3$ = 114 2 Triethylaluminum A colorless liquid in −18, b 190, decomp explosively in water **a fluoride** $AlF_3 3\frac{1}{2}H_2O$ = 147 2 Colorless crystals soluble in water and losing two mol H_2O at 120 *anhydrous-* AlF_3 = 84 1 A white powder, d 3 1, soluble in water, acids, alkalis or alcohol, used in the glass industry for the manufacture of porcelain ware **a fluosilicate** $Al_2(SiF_6)_3$ = 480 12 A silicofluoride White powder, insoluble in water, used in the glass industry and in the manufacture of enamels and artificial stones **a gallate** Gallal **a gluconate** See *gluconate* **a hydrate** a hydroxide **a hydroxide** $Al(OH)_3$ = 78 0 An amorphous, white powder, d 2 3 insoluble in water and decomp by acids or alkalis It occurs native as gibbsite, hydrargylite and zirlite With bases it forms salts, see *aluminic* acid Used medicinally as an astringent and externally as a dusting powder, commercially as a mordant and in the preparation of lakes and colors, also as a filter aid and neutralizing agent *basic-* There are various basic compounds AlO(OH), *e g*, *boehmite*, and $Al_2O(OH)_4$, *e g* *bauxite*, also mixtures with the normal hydroxide **a hypophosphite** $Al(H_2PO_2)_3$ = 223 2 Colorless crystals, soluble in water **a iodide** $AlI_3 6H_2O$ = 515 9 White crystals, soluble in water, alcohol, or carbon disulfide *anhydrous-* AlI_3 = 407 9 A brown crystalline mass, soluble in water, d 2 63, m 180, b 360, used in organic synthesis **a lactate** $Al(C_3H_5O_3)_3$ = 294 09 A yellowish powder, soluble in water **a methyl** $Al(CH_3)_3$ = 72 1 Aluminum methide, trimethylaluminum $AlMe_3$ A colorless liquid, m 9, b 130, decomp

by water **a naphtholsulfonate** Alumnol **a nitrate** $Al(NO_3)_3 9H_2O$ = 375 3 Colorless, rhombic crystals, m 73, decomp at 150, soluble in water or alcohol, and used medicinally as an astringent *anhydrous-* $Al(NO_3)_3$ = 213 1 A white powder, soluble in water, and used in the textile and leather industry **a minerals** Aluminum is the most abundant metal and is an essential constituent of all rocks, except the limestones and sandstones It is found chiefly in silicates, such as feldspar, clays, micas, sillimanite, andalusite, cyanite, but the principal ores are

corundum	Al_2O_3
bauxite	Al_2O_3, $2H_2O$
cryolite	AlF_3, $3NaF$

a nitride AlN = 41 1 Yellow crystals, m 2150, soluble in alkalis and slowly decomp by water **a oleate** $Al(C_{18}H_{33}O_2)_3$ = 870 8 A white powder, soluble in alcohol or ether and obtained by treating sodium oleate with alum It is used as an antiseptic in skin diseases, commercially in the manufacture of waterproofing materials and as a dryer for paints **a oxalate** $Al_2(COO)_6$ = 318 2 A white powder which is insoluble in water, alcohol, or ether but soluble in strong acids **a oxide** Al_2O_3 = 102 Alumina, corundum An amorphous white powder or colorless hexagonal crystals, d 3 75, m 2020, insoluble in water, acids or alkalis, but soluble in conc sulfuric acid It occurs in 4 crystalline forms α- or artificial corundum (the common form), β-, made by heating the hydroxide to 500–1000°C, γ-, by heating to 900–1100°C, and ζ-, by heating in molten Li_2O It is used as an abrasive, as a refractory and filtering material and is the chief constituent of materials as aloxite, alundum, borolon, etc **a palmitate** $Al(C_{16}H_{31}O_2)_3$ = 789 9 The salt of palmitic acid obtained from palm oil A granular white powder, insoluble in water, alcohol, or ether, but miscible and turpentine or coal oil, used in lubricants and waterproofing materials **a phenolate** $Al(OC_6H_5)_3$ = 306 09 A phenoxide Colorless powder d 1 23, m 265, decomp in water and used as antiseptic **a *p*-phenolsulfonate** $Al(C_6H_4(OH)SO_3)_3$ Aluminum sulfophenylate, sozal A pinkish powder, soluble in water or alcohol, and used medicinally as an antiseptic dusting powder for wounds **a phosphate** $AlPO_4$ = 122 1 Colorless, hexagonal crystals or an amorphous, white powder, insoluble in water but soluble in acids or alkalis, native as variscite, evansite, lucinite, sphaerite and turquoise Used as a cement when mixed with gypsum and waterglass, and also in ceramics **a potassium chloride** $AlCl_3$ KCl = 208 0 A white, crystalline powder, soluble in water **a potassium phenolsulfonate** $AlK(C_6H_4OHSO_3)_4$ A white or pinkish crystalline powder, soluble in water and used medicinally as an astringent, antiseptic, styptic and gargle **a potassium sulfate** $Al_2K_2(SO_4)_4 24H_2O$ = 948 74 Potassium alum, potash alum, common alum, kalinite A white powder or transparent, cubical crystals, d 1 757, m 84, soluble in water It is used extensively in industry as a mordant, in the manufacture of lakes, colors, paper glue and cements, medicinally as an astringent, emetic or styptic **a potassium tartrate** $KAl(C_4H_4O_6)_3$ = 362 13 A white powder soluble in water **a propoxide** $Al(OC_3H_9)_3$ = 204 13 A white powder, d 1 0578, m 106, b 248 decomp in water **a resinate** $Al(C_{44}H_{63}O_5)_3$ = 2041 5 A brown soft mass, insoluble in water and used as a dryer in varnish and for water-proofing materials **a rectifier** An apparatus which converts an alternating current into a pulsating direct current when the former is connected to two aluminum plates immersed in sodium bicarbonate solution **a rhodanate** $Al(CNS)_3$ = 201 4 Aluminum sulfocyanide, rhodanide or thiocyanate A yellowish powder, slightly soluble in water, used in the textile industry **a rubidium sulfate** $AlRb(SO_4)_2 12H_2O$ = 520 85 Rubidium alum Colorless crystals, d 1 87, m 99, slightly soluble in water **a salicylate** $Al(C_6H_4OH\,COO)_3$ = 438 2 Salumin A faintly pink powder, insoluble in water, alcohol or ether but soluble in ammonium hydroxide or alkalis, used as an antiseptic in the treatment of nose and throat diseases **a screen** A canvas covered with aluminum, used for projection of slides or films **a silicate** $Al_2(SiO_3)_3$ = 282 4 White masses, insoluble in water or acids and used in the glass industry as a refractory lining for tanks and pots Native as

cyanite	d 3 60, decomp 1325°C
andalusite	d 3 20, decomp 1350°C
sillimanite	d 3 23, decomp 1530°C
mullite	d 3 18, decomp 1810°C

Cf *kaolin* **a silico-fluoride** $Al(SiF_3)_3$ = 283 3 A white powder, insoluble in water, used in the glass industry and in manufacturing enamels and artificial stones **a sodium chloride** $AlCl_3$ NaF = 191 94 Colorless crystals m 183, soluble in water **a sodium fluoride** AlF_3 $3NaF$ = 210 10 Colorless crystals, d 2 9–3 08, sparingly soluble in water **a sodium sulfate** $AlNa(SO_4)_2 12H_2O$ = 458 42 Sodium alum, soda alum Colorless rhombic crystals, $d_{20°}$ 1 675, m 61, soluble in water and insoluble in alcohol It is used for water purification, in dye, paper and the textile industries **a stearate** $Al(C_{18}H_{35}O_2)_3$ = 877 2 The aluminum salt of stearic acid, obtained by saponifying tallow or animal fat and treatment of the soap with alum A grayish-white powder or yellowish masses, soluble in warm water Used in lubricating and water-proofing compounds **a sulfate** $Al_2(SO_4)_3 18H_2O$ = 666 5 Colorless monoclinic crystals, d 1 62, which decomp when heated, soluble in water It is used similarly to alum *anhydrous-* $Al_2(SO_4)_3$ = 342 4 White crystals or powder, d 2 59, decomp 77, soluble in water Used as a reagent for dyes, in wine, as an antiseptic, caustic or astringent for external use, and in the leather paper, and dye industries **a sulfide** Al_2S_3 = 150 4 Yellow crystals, d 2 37, m 1100, decomp in water or acids **a sulfocyanate** a rhodanate **a sulfocyanide** a rhodanate **a sulfophenylate** a phenylsulfonate **a tannate** Tannal A light brown powder used as an antiseptic, astringent or styptic **a tartrate** $Al_2(C_4H_4O_6)_3$ = 498 2 A white powder insoluble in water, but soluble in ammonia or acids **a thallium sulfate** $AlTl(SO_4)_2 12H_2O$ = 639 4 Thallium alum Colorless crystals, d 2 32, slightly soluble in water **a triethide** $AlEt_3$ = 114 09 Triethyl a Colorless liquid, decomp by water to ethane and a hydroxide **a trimethide** $AlMe_3$ = 72 04 Trimethyl a

Colorless liquid, decomp in water to methane and a hydroxide **a zinc sulfate** $Al_2Zn(SO_4)_4$ = 503 8 Zinc alum Colorless crystals, powder or sticks, soluble in water Used as a caustic

alumite Alunite

alumnol Aluminum β-naphtholsulfonate $Al_2[C_{10}H_6OH(SO_3)_2]_3$ A white powder, soluble in water, used externally as astringent, and as an antiseptic in the treatment of abscesses, as a gargle and for tonsilitis

Alums See *alum*

alundum A pure crystalline aluminum oxide in granular form, d 3 9–4 0 m 2050 It is used as reagent for the determination of carbon in steel, as an abrasive, a basic refractory, filtering material and for chemical apparatus **a boat** A combustion tube made of alundum **a cement** A carrier for catalysts prepared by heating 90 pts Al_2O_3, 5 pts SiO_2 and 5 pts CaO **a crucible** (1) A highly-refractive crucible for the electric furnace, used for melting platinum (2) A porous filtering crucible **a dish** A shallow dish used for incinerations **a filter cone** An alundum filter cone which fits into a funnel **a filter dish** A shallow filter dish that fits into a glass funnel **a muffle** A muffle made of alundum and used in the assay of metals **a pyrometer tube** A long thin tube made of alundum and used in pyrometers

alunite Probably $K_2SO_4 Al_2(SO_4)_3 4Al(OH)_3$ Alumite Neutral alum Alum stone A native, white, hydrous potassium aluminum sulfate d 2 83, hardness 3 5–4 0, which occurs in rhombic hexagonal crystals, sparingly soluble in water

alunogen $Al_2(SO_4)_3 18H_2O$ A native, silky-white, hydrous aluminum sulfate which occurs in monoclinic crystals

alurate A brand of allyl-isopropyl-barbituric acid

alva marina A prepared seaweed used for stuffing mattresses or chairs

alveolar air Respired air

alvite The mineral, $(ZnHfTh)SiO_4$

alypine $C_{15}H_{26}O_2N_2HCl$ = 302 6 2-benzoxy-2-dimethylaminomethyl-1-dimethylamino-butane hydrochloride White hygroscopic crystals m 169, soluble in water Used medicinally as a local anesthetic

Am An abbreviation for (1) NH_4 group (ammonium), (2) C_5H_{11} radical, (amyl)

am The symbol for *atom-meter*, a proposed name for *Angström* unit

amadou Surgeons' agaric, punk, tinder The fungus *Boletus igniarius*, found on old tree trunks, used as tinder, for surgical pads and as a styptic

amalgam (1) An alloy of mercury, generally solid or semiliquid, as, ammonium a , gold a , silver a , sodium a (2) An alloy of silver and mercury **native-** An alloy of mercury with silver or gold, *e g* , AuHg$_3$, Hg$_3$Ag$_2$, etc , occurring as minerals as *arquerite*

amalgamation The formation of an alloy of a metal with mercury **a process** A method of extracting noble metals, especially gold, from ores by alloying them with mercury

amalgamator An apparatus used in mines for extracting gold from ores

amalic acid Amalinic acid

amalinic acid $C_{12}H_{12}O_7N_4$ = 324 3 Amalic acid, tetramethyl alloxantine Colorless crystals, m 245°, soluble in hot water, alcohol or ether

amandin A globulin from fruit kernels, e g , peach seeds and sweet almonds

Amanita A genus of fungi (mushrooms) many of which are poisonous, as, *A phalloides*, Death head fungus, death cup, containing *phallin*, q v , *A muscaria*, fly agaric, fly amanita, containing muscarufin, *A verna*, the "destroying angel" **a -toxin** A protein from *A phalloides*, death-head fungus It is the cause of many cases of mushroom poisoning

amanitine $C_5H_{15}O_2N$ = 121 1 (1) The tertiary amine $Me_3N(OH)CHOH\ Me$ An alkaloid of Amanita species, as, *A pantherina* and *A muscaria*, identical with neurine (2) $C_5H_{15}O_2N$ = 121 1 Isocholine The tertiary amine, $Me_3N(OH)CH\ CH_2OH$ An alkaloid from mushrooms (*Agaricus muscari*) which is oxidized to muscarine Cf *choline*

amaranth A deep-red aniline dye, $NaSO_3-C_{10}H_5\ N\ N\ C_{10}H_4(SO_3Na)_2OH$, used as a food-color

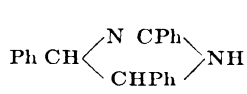
Amaranthaceae A family of plants comprising 40 genera and 500 species of weeds, pot-plants, and fodder plants

amaranthus The fresh root of the shrub *A spinosa*, used in India as a specific for gonorrhea

amarbital A brand of phenyl-ethyl-barbituric acid

amargosa bark The root bark of the goatbush, *Castela nicholsoni*, a Simarubaceae, it is a source of castelamarin

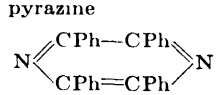
amarine $C_{21}H_{18}N_2\ \frac{1}{2}H_2O$ = 307 28 Triphenyl-dihydro-glyoxalin, 4 5-dihydro-2 4 5-triphenyl-imidazole,



Bitter, colorless prisms, anhydrous at 130, soluble in alcohol or ether, and insoluble in water It is formed by the action of ammonia upon benzoic acid and occurs in oil of bitter almonds

amaroid Bitter principles, other than alkaloids, glucosides, or tannins, which occur in plants, as, quassin, chamomillin

amaron $C_{28}H_{20}N_2$ = 384 32 Tetraphenyl-p-pyrimidine, benzoin imide, ditolanazotide, tetraphenyl pyrazine



Small, colorless needles, m 245, insoluble in water, soluble in alcohol or ether

Amaryllidaceae A family of plants comprising about 75 genera and 700 species Many of them are ornamental tropical and subtropical plants, as, narcissus, agave Cf *lycorine*

amatol An explosive containing 80 pts ammonium nitrate and 20 pts trinitrotoluene, used in coal-mines

amazonite Amazon stone, microcline A bright green potassium aluminum silicate, used as a precious stone

amber $C_{10}H_{16}O$ (?) Electrum, succinum A fossilized, bituminous resin, d 1 1, which occurs as hard, brittle and transparent masses of yellow to brown color It is used as a precious stone and in experiments on static electricity It occurs as succinite and gedanite **artificial-** Colophony **Baltic-** Succinite **Cana-**

dian- Chernawinite **synthetic-** A formal dehyde-phenol or -urea resin

a acid Succinic acid Cf *ambreic* acid **a oil** A brown essential oil of empyreumatic and balsamic odor distilled from amber, d 0 915–0 975, miscible with alcohol **a seed** Musk seed

Amberg swimming cup A perforated porcelain tumbler with cork stopper, used for washing microscope specimens by floating them in a solvent

ambergris The opaque, grayish, waxy masses formed in the intestines of the sperm whale d 0 7–0 92, m 60, b 100, soluble in alcohol or ether, used in perfumery Cf *ambrein, spermaceti*

amberite (1) A smokeless powder composed of guncotton, paraffin and barium nitrate (2) Compressed amber scrap used for electrical insulation

amblygonite $LiAlFPO_4$ A native lithium aluminum fluorspar occurring in California, as pale-green triclinic crystals

amblystegite Enstatite

amboceptor Fixator A heat-resisting substance in blood which has two haptaphore groups (cytophile and complementophile), it unites the cell-body with the complement Cf *polyceptor, complement* fixation, immunity, and *Ehrlich's* side chain theory

amboyna wood An Indian wood from *Pterospernum indicum*, used in East India for inlay work

ambreic acid A yellowish-white substance derived from amber and probably identical with cholesteric acid

ambrein A cholesterin obtained from ambergris

ambrette Musk seed

ambrettolic acid $C_{16}H_{30}O_3 = 270\ 25$ ζ-hydroxy-ζ-hexadecenic acid $Me(CH_2)_7CH\ COH\text{-}(CH_2)_5COOH$ **dihydro-** Juniperic acid

ambrion An insulating material consisting of asbestos impregnated with pitch or rosin

ambrite A fossilized resin found in New Zealand as greasy, yellowish-gray masses, sometimes used for semi-precious stones

ambron A proposed term for the positive nucleus of an atom

Ambrosia A genus of composite-flowered herbs, whose pollen causes of hay fever, as *A artemisifolia*, or rag-weed

ameba Amoeba A unicellular animal without definite shape, resembling a mass of moving jelly, and exhibiting all the features of life, *e g* growth, reproduction, metabolism, locomotion, etc

amebicide An agent that destroys ameba, as, emetine or quinine

ameboid Assuming various shapes, like a moving ameba

ameliaroside Piceoside A glucoside from *Amelancher vulgaris*, a Rosaceae

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American aloe Agave **A colombe** Fraserin **A ginseng** Ginseng **A hellebore** Veratrum **A ipecac** Gillenia **A saffron** Carthamus **A valerian** See Cypripedium **A veratrum** Veratrum **A wormseed oil** Chenopodium oil

Ames moisture tester An apparatus for the determination of moisture in butter It consists of a paraffin-jacketed container in which the butter, in an aluminum cup, is placed

amesite A ferromagnesium aluminum silicate of variable composition

amethyst A purple or bluish-violet quartz found in India, Ceylon, Brazil, etc, used as a precious stone for seals and ornaments **oriental-** A purple, native alumina, Al_2O_3 **true-** Oriental-

amianthus Earth flax, mountain flax A fine, silky variety of asbestos

amicron A particle whose diameter is less than $5m\mu$ See *micron* It is invisible under the ultra-microscope

amidase A hydrolytic enzyme which splits ammonia from urea

amidation The process of forming an amide, *e g*, (a) heating the corresponding ammonium salt

$$R\ COONH_4 \rightarrow R\ CONH_2 + H_2O$$

(b) reaction of NH_3 on an acid chloride

$$R\ COCl + 2NH_3 \rightarrow R\ CONH_2 + NH_4Cl$$

(c) reaction of NH_3 with an ester

$$R\ COOR + NH_3 \rightarrow R\ CONH_2 + R'OH$$

Cf *amination*

amide (1) An organic compound containing the monovalent —CO NH_2 radical, as,

formamide	$H\ CO\ NH_2$
acetamide	$Me\ CO\ NH_2$
benzamide	$Ph\ CO\ NH_2$
oxamide	$(CONH_2)_2$

They are derived from acids by replacing the —OH group by —NH_2, as, —COOH → —$CONH_2$, or from ammonia by the replacement of a hydrogen by an acyl group $NH_3 \rightarrow NH_2\ OCR$ (2) Ammonobases Compounds in which one H of NH_3 is replaced by a metal, as,

sodamide	$NaNH_2$
zinc imide	$Zn(NH_2)_2$

alkyl- A group of compounds obtained by treating an acid chloride or acid anhydride with an amine and sodium hydroxide They have the general formula $R\ C(=O)NHR$ Cf *anilide*

keto- A compound containing the monovalent radical —CO $CONH_2$ **oxy-** A compound containing both, the —OH and —$CONH_2$ groups **thio-** A compound containing the —$CSNH_2$ group

a chloride A chlorinated amide, $R\ C(NR_2)Cl_2$ derived from an alkyl a The compound $R\ C(NH_2)Cl_2$ passes readily into the imide chloride $R\ C(NH)Cl$ **a group** The monovalent formamyl group, —CO NH_2 which confers weakly basic properties

amidin A transparent solution of starch in water

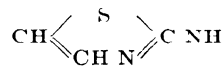
amidine Any compound containing the monovalent radical $-C(=NH)-NH_2$, as

formamidine	$HC(=NH)NH_2$
acetamidine	$MeC(=NH)NH_2$
cyanamidine	$NCC(=NH)NH_2$

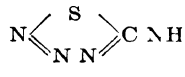
They are derived from the amides by the replacement of oxygen by the divalent amido residue, >NH or >NR Cf *benzimidazole, phasotropy*

di- A compound containing two amidine groups, *e g*, oxalamidine, $NH_2(HN=)C-C(=NH)NH_2$

amido The monovalent $-NH_2$ radical when present in a compound with the —CO radical, otherwise it is termed *'amino"* **a acetophenone** $C_6H_4NH_2COMe$ Colorless crystals, m 106, soluble in water, alcohol or ether, used as a reagent in Ehrlich's diazo reaction **a aldehyde** Any compound containing both the amino and aldehyde radical, as, NH_2-CH_2-CHO, a acetaldehyde **a benzoylformic acid** Isatinic acid **a F acid** β- Naphthylamine-7-sulfonic acid **a ketone** A compound containing both the amino and keto groups, as, NH_2CH_2COMe, amido acetone, and $NH_2-CHEtCOMe$, amido propyl ketone **a mandelic acid** Hydrindic acid **a mandelic acid lactame** Dioxindole **a naphthol disulfonic acid** H-acid **a oximes** Amidoximes **a phosphoric acid** Phosphamic acid The compound, $PO(NH_2)O_2$ **a pyrine** Pyramidone **a thiazole** $C_3H_4N_2S$ = 100 1 The heterocyclic compound



α-methyl- NH_2C_4HNSMe A colorless crystalline substance, m 42, b 136 **a triazulfole** CH_2N_4S = 102 2 Amidotriazosulfole The heterocyclic compound



methyl- CN_3SNHMe Colorless crystals m 96 **a urea** Semicarbazide

amidogen Amido

amidol $C_6H_8ON_2HCl$ = 160 5 3,4-diaminophenol hydrochloride $(NH_2)_2C_6H_3OH\cdot HCl$ Colorless crystals, slightly soluble in water, used as a photographic developer

amidopyrine $C_{13}H_{17}ON_3$ = 231 16 (U S P, XI) Dimethylaminoantipyrine, ampydin, dimethylaminophenyl-dimethyl pyrazolone White crystalline powder, m 108, soluble in water, used as an analgesic

amidoxalyl Oxamyl

amidoxime Oxamidine A compound containing the monovalent amidoxime group, $-C(=NOH)NH_2$ *E g*, methenyl- or formamidoxime, $HC(NOH)NH_2$, ethenyl- or acetamidoxime $CH_3C(NOH)NH_2$

amidoxyl Hydroxylamino A compound containing the monovalent amidoxyl group, —NHOH derived from hydroxylamine *E g*, amidoxyl acetic acid, $HONHCH_2COOH$

amidrazone A compound containing the monovalent $C_6H_5NHN=C(NH_2)$-radical, *e g*, methyl-$C_6H_5NHN=C(NH_2)CH_3$ (See *hydrazidines*)

amination The formation of an amine, *e g*

(a) reduction of a nitro compound

$$RNO_2 + 6H \rightarrow RNH_2 + 2H_2O$$

(b) reduction of a cyanide

$$RCN + 4H \rightarrow RCH_2NH_2$$

(c) oxidation of an amide

$$RCONH_2 + NaOBr + NaOH \rightarrow RNH_2 + NaBr + Na_2CO_3 + H_2O$$

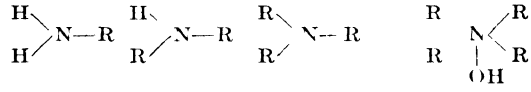
(d) treating isocyanate with alkali

$$RNCO + 2KOH \rightarrow RNH_2 + K_2CO_3$$

Cf *amidation*

amine (1) See *amines* (2) A suffix indicating an $-NH_2$ group

amines A group of compounds derived from ammonia by substituting organic radicals for the hydrogens, as,



primary- secondary- tertiary- quaternary- (amines) (imines) (nitriles) (ammonium) Cf *amino, amide, arsine, phosphine* **di-** a containing two NH_2-groups **metallic-** An *amide* (2), q v **primary-** Amino-bases Compounds in which one hydrogen is replaced by a radical, *e g*, NH_2CH_3 **quarternary-** Tetraalkyl ammonium bases Compounds derived from ammonium hydroxide containing four radicals, *e g*, $N(CH_3)_4OH$ **secondary-** Imino bases Compounds in which two hydrogens are replaced by a radical, *e g*, $NH(CH_3)_2$ **tertiary-** Nitrile bases Compounds in which three hydrogens are replaced by radicals, *e g*, $N(CH_3)_3$ **thionyl-** A compound containing the —N SO radical **tri-** A compound containing three NH_2 groups, cf *semidines*

aminic acid Formic acid

amino The monovalent basic $-NH_2$ group indicated by the *prefix* amino* or *suffix* amine*, as, aminomethane or methylamine **a acetal** $C_6H_{15}O_2N$ = 133 16 The compound $NH_2-CH_2CH(OEt)_2$ Colorless needles m 103 soluble in water, alcohol or ether Cf *glycinaldehyde* **a acetanilide** $C_8H_{10}ON_2$ = 150 - 14 Acetylphenylenediamine The compound $NH_2C_6H_4NHCOMe$ Colorless needles, *ortho-* m 165, *meta-* m 90, *para-* m 160, slightly soluble in water and soluble in alcohol or ether **a acetic acid** Glycine **a acetone** NH_2CH_2COMe = 73 08 Colorless needles, m (decomp) 188, soluble in water or alcohol **a acetphenetidine** See Phenocoll **a acetophenone** C_8H_9ON = 135 1 p-aminophenylmethyl ketone $NH_2C_6H_4COMe$ A yellow powder, m 105, slightly soluble in water soluble in alcohol or ether *ortho-* a liquid, b 251 **a acid** See *amino-acids* **a alcohols** Alkamines **a anthraquinone** See *anthraquinone* **a azobenzene** $C_{12}H_{11}N_3$ = 197 2 Aniline yellow $PhN=NC_6H_4NH_2$ Yellow needles, m - 125, b 360, slightly soluble in water, soluble in alcohol or ether An intermediate product in the preparation of dyes and medicinals as acid

yellow and inulin, and is used as indicator changing at pH 2 5 from orange (acid) to yellow (alkaline) **a azobenzene chlorhydrate** $C_{12}H_{11}N_3$ HCl Pale-blue needles, slightly soluble in water and soluble in alcohol, used in dye manufacture **a azobenzene-β-naphthol** Sudan red III **a azonaphthalene** $C_{20}H_{16}N_2$ = 297 25 The compound $C_{10}H_7N$ $NC_{10}H_6NH_2$ *alpha-* Red needles, m 174, slightly soluble in alcohol or ether *beta-* Red needles, m 159 **a azotoluene** The compound MeC_6H_4N $NC_6H_3(NH_2)Me$ Red crystals, m 100, insoluble in water, but soluble in alcohol, used medicinally in the treatment of ulcers **a azotoluene hydrochloride** The compound MeC_6H_4N $NC_6H_3(NH_2)Me$ HCl Colorless crystals, soluble in water or alcohol It exists in 4 isomeric forms, and is used in organic synthesis **a barbituric acid** Uramil **a benzaldehyde** See *benzaldehyde* **a benzamide** See *benzamide* **a benzene** Aniline **a benzene sulfonic acid** *o-* Orthanilic acid *m-* Metanilic acid *p-* Sulfanilic acid **a benzoic acids** See *benzoic acid* **a caproic acid** Leucine **a dracilic acid** See p-amino-*benzoic acid* **a diphenyl** Xenylamine **a ethanol** Ethanolamine **a ethionic acid** Taurine **a formic acid** See *formic acid* **a G-acid** *2*-naphthylamine-*6 8*-disulfonic acid **a glutaric acid** See *glutaric acid* **a guanidine** See *guanidine* **a phenol** C_6H_7ON = 109 1 A group of compounds of the type $NH_2C_6H_4OH$ **1 2-**, or *ortho-* Aminophenol base Colorless rhombic crystals, m 179, slightly soluble in water or alcohol, soluble in ether **1 3-**, or *meta-* Colorless crystals, m 123, slightly soluble in water, very soluble in alcohol or ether **1 4-**, or *para-* Rodinol Colorless leaflets, m - (decomp) 184, slightly soluble in water, alcohol or ether Used as a developer in photography and as a reducing agent in the dye industry **a propionic acid** Alanine **a phthalhydrazide** Luminol **a purine** Adenine **a quinoline** $C_9H_8N_2$ = 144 13 The crystalline compounds C_9H_6N NH_2 *alpha-* Colorless crystals, m 125, soluble in ether, slightly soluble in water or alcohol *beta-* Colorless crystals decom 280, insoluble in water or alcohol **a, R-acid** *2*-Naphthylamine-*3 6*-disulfonic acid **a sulfonic acid** Sulfamic acid **a succinamic acid** Aspargine **a thiophen** Thiophenine **a toluene** Toludine **a xylol** Xylidine

aminoacids A group of organic compounds of the general type,

$$NH_2—R—COOH,$$

in which R is an aliphatic radical They have both basic and acidic properties and form the units of peptides and proteins **alpha-** or **primary-** General formula, $NH_2CHR\,COOH$, and are the commoner aminoacids **beta-** or **secondary-** General formula, $NH_2CHR\,CH_2COOH$ **gamma-** or **tertiary-** General formula, $NH_2CHR\,CH_2CH_2COOH$ **delta-** or **quaternary-** General formula, $NH_2CHR\,CH_2CH_2CH_2COOH$

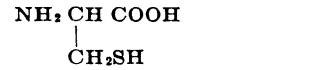
AMINOACIDS

1 *Monoamino-monocarboxylic acids* $NH_2—R—COOH$

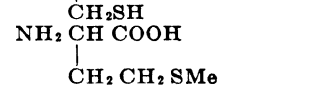
carbamic acid	$NH_2\,COOH$
glycine aminoacetic acid Glycocol	$NH_2\,CH_2\,COOH$
glycin (photographic developer) α-amino-β-*p*-hydroxyphenyl acetic acid	$NH_2\,CH(C_6H_5OH)\,COOH$
alanine α-aminopropionic acid	$NH_2\,CHMe\,COOH$
aline α-amino-isovaleric acid	$NH_2\,CH(CHMe_2)\,COOH$
norvaline α-aminovaleric acid	$NH_2\,CH(CH_2CH_2Me)\,COOH$
leucine α-amino-isocaproic acid	$NH_2\,CH(CH_2CHMe_2)\,COOH$
norleucine α-amino-caproic acid	$NH_2\,CH(CH_2CH_2CH_2Me)\,COOH$
isoleucine α-amino-β-methylethyl-propionic acid	$NH_2\,CH(CHMeEt)\,COOH$
isovaline α-amino-α-methylbutyric acid	$NH_2\,CMe(CH_2Me)\,COOH$
phenylalanine α-amino-β-phenylpropionic acid	$NH_2\,CH(CH_2Ph)\,COOH$
tyrosine α-amino-β-parahydroxyphenyl propionic acid	$NH_2\,CH(CH_2C_6H_4OH)\,COOH$
serine α-amino-β-hydroxypropionic acid	$NH_2\,CH(CH_2OH)\,COOH$
α-amino-β-hydroxybutyric acid	$NH_2\,CH(CHOH\,CH_3)\,COOH$

AMINOACIDS—(*Continued*)

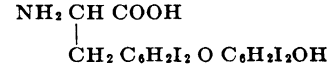
cysteine
α-amino-β-thiopropionic acid



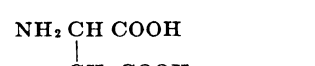
methionine
α-amino-γ-methylthio-butyric acid



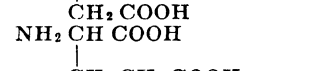
thyroxine



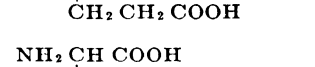
2 *Monoamino-dicarboxylic acids* $NH_2R(COOH)_2$
aspartic acid
α-aminosuccinic acid



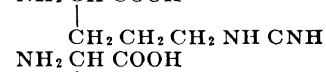
glutamic acid
α-aminoglutaric acid



3 *Diamino-monocarboxylic acids* $(NH_2)_2R\,COOH$
arginine
α-amino-δ-guanidine valeric acid

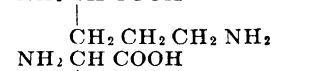


lysine
α, ϵ-diaminocaproic acid



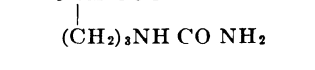
ornithine
α-δ-diaminovaleric acid

asparagine
α-aminosuccinamic acid

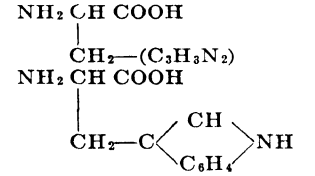


citrulline
α-amino-δ-ureylvaleric acid

4 *Heterocylic amino acids*
histidine
α-amino-β-imidazolepropionic acid

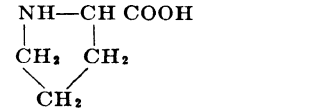


tryptophane
α-amino-β-indolepropionic acid

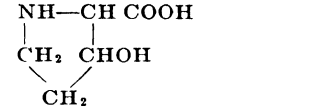


proline

α-pyrrolidine carboxylic acid



hydrooxyproline
γ-hydroxy-α-pyrrolidine carboxylic acid



aminoketones A group of aromatic compounds containing the monovalent —NHCHO radical, *e g* , formanilide, C_6H_5 NHCHO, or the divalent —NH CO— radical Cf *peptides*

aminophenols A group of aromatic compounds containing both, the —OH and —NH_2 groups attached to the benzene ring, *e g* ,

aminophenol	HO C_6H_4 NH_2
diaminophenol	HO C_6H_3 $(NH_2)_2$
triaminophenol	HO C_6H_2 $(NH_2)_3$

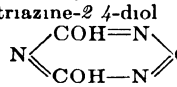
aminopherases A group of intracellular enzymes of the desmolase type, which produce transamination (q v)

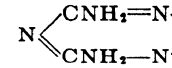
aminophyllin A brand of theophylline ethylenediamine used as a diuretic and cardiotonic

aminoxylol Xylidine

amiodoxyl benzoate $C_6H_4(IO_2)COONH_4$ = 305 1 Ammonium *o*-iodoxy-benzoate Colorless, odorless crystals, soluble in water, slightly soluble in alcohol, used as an antiarthritic

amitosis Cell-division, which differs from mitosis in that there is no apparent change in the structure of the cell nucleus, hence it is also known as cell-cleavage or direct cell division

ammelide $C_3H_4O_2N_4$ = 128 1 Cyanin monamide, aminocyanuric acid, cyanuramide, 6-amino-*s*-triazine-2 4-diol The heterocyclic compound,  A colorless powder, decomp if heated, insoluble in water or alcohol and soluble in acids iso- See *isocyanurimide*

ammeline $C_3H_5ON_5$ = 127 1 Diaminocyanuric acid, cyanuro diamide, cyanin, diamide, 4 6-diamino-*s*-triazin-2-ol The heterocyclic compound,  Colorless, deliquescent needles, formed by boiling melam with hydrochloric acid, insoluble in water or

alcohol and soluble in bases, but decomp by heating **ethyl-** See *ethyl* **iso-** Isocyanurimide

ammeter *Ampere* meter

ammines Ammoniates, ammonates, ammino compounds, metal ammines, ammono A group of complex inorganic metal-ammonia compounds which may be regarded as metal salts with ammonia in a rôle analogous to that of "water" of crystallization, as, $CoCl_3 6NH_3$ which is written $[CO(NH_3)_6]Cl_3$, or $[Fe(NH_3)_6](SO_4)_3$ can be regarded as $Fe_2(SO_4)_3 12NH_3$ Cf *aquo* ions, *ammonia* system, *crystal* ammonia, tetrammines

ammino A prefix indicating the presence of NH_3 in a coordinate compound, as in *ammines*

ammiolite A native antimonate of mercury

ammite A sandstone or oolite

ammonate See *crystal* ammonia

ammonchelidonic acid Chelidamic acid

ammonia $NH_3 = 17\ 01$ A colorless gas, $d_{air=1}$ 0 5971, m −77 7, b −35 5, very soluble in water, forming ammonium hydroxide It has a strong characteristic odor and is used in ice-machines as a refrigerant, as a fertilizer applied directly to irrigation water, and as a reagent in the chemical industries **anhydrous-** Liquid a A colorless liquid, $d_{-32°}$ 0 6382 m −77 56, b −33 3, which is compressed in steel cylinders and used in organic synthesis as a solvent, and in refrigeration **crystal-** See *crystal* **hydroxy-** Hydroxylamine **liquid-** Anhydrous a **substituted-** See *amine, amide, ammine, amino ammonium*

a absorption apparatus A device for absorbing a , as Folin's, Cumming's or Referees' tubes **a amalgam** An amalgam of mercury and ammonium, made from sodium amalgam and ammonium chloride **a liquor** Gas liquor A by-product of gas and coke plants which is obtained by scrubbing the gases with water, it is used in the *Solvay* process, q v , and in the manufacture of a and ammonium salts **a nitrogen** The nitrogen in an organic compound, especially proteins, which is in the form of a $—NH_2$ or $>NH$ radical (a or imino nitrogen, respectively) **a soda process** A process introduced by Brunner and Mond in 1874 for the manufacture of sodium carbonate from salt, ammonia, limestone, and coke Cf *Solvay* process **a system** A system of acids, bases and salts with liquid a as solvent instead of water Thus, in the *water* system

$$\underset{\text{aquo-base}}{MOH} + \underset{\text{aquo-acid}}{HX} \underset{\text{hydrolysis}}{\overset{\text{neutralization}}{\rightleftharpoons}} \underset{\text{aquo-salt}}{MX} + HOH$$

and in the *ammonia* system

$$\underset{\text{ammono-base}}{M\,NH_2} + \underset{\text{ammono-acid}}{HX} \underset{\text{ammonolysis}}{\overset{\text{neutralization}}{\rightleftharpoons}} \underset{\text{ammono-salt}}{MX} + H\,NH_2$$

a tube Faraday tube **a water** Ammonium hydroxide, spirits of hartshorn, NH_4OH = 35 1 An aqueous solution of ammonia (1) 35 % *Concentrated* ammonium hydroxide A clear colorless liquid, d 0 880, of strong, characteristic odor and alkaline reaction Used extensively as a reagent, solvent, precipitant and neutralizing agent (2) 28 % d 0 900, used as above (3) 20 % d 0 925, it is used as above (4) 10 % *Dilute ammonium hydroxide*, d 0 960 The test solution of the U S P , and a common reagent, used as above

ammoniac Ammoniacum **sal-** Ammonium chloride **a oil** A dark, yellow essential oil from ammoniacum, d 0 891, b 250–290, slightly dextro-rotatory

ammoniacal Pertaining to ammonia, as, its odor

ammoniacum Gum ammoniac A resinous gum from *Dorema ammoniacum*, an Umbelliferae of Persia and Northern India Used as a sedative and tonic in hysteria and externally in plasters, also as a cement for porcelain

ammoniate (1) Ammine (2) An organic nitrogen compound, used as a fertilizer

ammoniated iron Ferric ammonium chloride **a mercury** See *mercury* **a superphosphate** A superphosphate treated with (1) ammonia or (2) dissolved bone and nitrogenous compounds, used as fertilizer

ammonification The enrichment of the soil with ammonia or ammonium compounds *e g* the production of NH_3 from proteins and decaying organic matter by the activity of soil bacteria

ammonifying (1) Producing or (2) adding ammonia

ammonio (1) Ammono (2) A prefix indicating a double salt of ammonium and a metal, as, a cupric chloride (see *cupric*)

ammonite A fossil shell

ammonium Am The monovalent radical, $—NH_4$, which has basic properties and resembles an alkali metal radical Cf *ammono, ferriammonium, tetraethyl ammonium*

a acetate $CH_3COONH_4 = 77\ 08$ Colorless hygroscopic crystals, d 1 073, m 89, b 148, very soluble in water Used as an antipyretic and diaphoretic, as antidote in formaldehyde poisoning, as a reagent in determining iron and lead and in separating Pb Ca, Ba, and Sr sulfates **a aldehyde** See *aldehyde a* **a aluminum sulfate** a alum **a alum** $Al_2(NH_4)_2(SO_4)_4 24H_2O$ = 906 90 Aluminum ammonium sulfate Colorless, regular crystals, d 1 645, m 94 5, soluble in water Used for the purification of drinking water, as a constituent of baking powder and foam fire extinguishers, and in electroplating, also medicinally as an astringent, diuretic, emetic and purgative **a amino sulfonate** $NH_4SO_3NH_2$ = 114 2 Deliquescent crystals, soluble in water **a anacardate** A brown, syrupy liquid, used for coloring hair **a antimoniate** $NH_4SbO_3 2H_2O$ = 222 27 Colorless crystals, decomp when heated, soluble in water **a arsenate** $(NH_4)_3AsO_4 3H_2O$ = 247 2 Colorless crystals soluble in water *acid-* $(NH_4)_2HAsO_4$ = 176 0 White crystals, soluble in water and used internally for the treatment of skin diseases **a arsenite** NH_4AsO_2 = 125 0 Colorless prisms, or white powder soluble in water or alkalis **a atreolate** Atreol **a aurichloride** NH_4AuCl_4 = 357 10 Yellow plates, decomp 100, soluble in water **a auricyanide** $NH_4Au(CN)_4 H_2O$ = 337 32 Yellowish plates, decomp 200, soluble in water or alcohol **a aurocyanide** $NH_4Au(CN)_2$ = 293 3 Colorless plates, decomp 150, soluble in water **a benzoate** $NH_4 C_7H_5O_2$ = 139 1 White crystals, d 1 260, decomp 198, soluble in alcohol or water Used as an antipyretic, diuretic or alterative **a biarsenate** a arsenate, acid-

a biborate $NH_4HB_2O_4\ 1\frac{1}{2}H_2O$ = 132 1 Colorless crystals, soluble in water **a bicarbonate** NH_4HCO_3 = 79 1 Rhombic or monoclinic colorless crystals, d 1 586, decomp 40–60, soluble in water or alcohol Used to neutralize hyperacidity of the stomach, and in manufacturing ammonium salts **a bichromate** $(NH_4)_2Cr_2O_7$ = 252 2 Orange crystals, d 2 367, decomp when heated, soluble in water Used as a reagent, and in the manufacture of inks, glass, leather and fireworks **a bifluoride** $NH_4F\ HF$ = 57 1 A acid fluoride, matt salt, a hydrogen fluoride Colorless hexagonal crystals, $d_{12°}$ = 1 211, soluble in water Used in the analysis of silicates, in the glass and porcelain industry for etching and as a preservative in breweries, wineries and dairies **a bimalate** $NH_4H(C_4H_4O_5)$ = 131 1 White crystals, soluble in water **a bioxalate** $HOOC\ COONH_4$ = 107 1 Ammonium acid oxalate, ammonium binoxalate Colorless crystals, d 1 556, soluble in water, used as an ink eraser and reagent **a biphosphate** $NH_4H_2PO_4$ = 115 1 Monoammonium phosphate, diacid a phosphate Colorless tetragonal crystals, d 1 803, soluble in water Used as a reagent, and (mixed with sodium bicarbonate) in baking powder **a bisulfate** NH_4HSO_4 = 115 11 Mono-ammonium sulfate Ammonium acid sulfate Colorless crystals, d 1 787, soluble in water, used as a reagent **a bisulfite** NH_4HSO_3 = 99 11 Mono-ammonium sulfite, sulfite acid Colorless crystals, soluble in water and used as a preservative **a bitartrate** $NH_4HC_4H_4O_6$ = 167 1 Mono-ammonium tartrate, a acid tartrate Colorless crystals, d 1 680, soluble in water Used for the detection of calcium, and also in baking powders **a borate** $(NH_4)_3BO_3$ = 113 1 Colorless crystals, d 2 38–2 95, soluble in water **a boro-benzoate** A white powder, soluble in water, and used as an antiseptic for preservation of foods **a borofluoride** NH_4BF_4 = 105 04 Colorless regular crystals, $d_{17°}$ = 1 851, soluble in alkali, water, alcohol or ether **a boro-citrate** A white powder, soluble in water and used as an antiseptic **a bromide** NH_4Br = 97 96 Colorless regular crystals or white powder, d 2 327 sublimes on heating, and is soluble in water, alcohol or ether, used as a reagent and in the treatment of epilepsy, neuralgia, etc , also in the manufacture of photographic plates **a bromoplatinate** a platinic bromide **a camphorate** $NH_4C_{10}H_{15}O_4\ 3H_2O$ = 271 A colorless crystalline powder, soluble in water, used as a sedative **a carbamate** $NH_2\ COONH_4$ = 78 1 A carbaminate A white crystalline powder, soluble in water, and used as a stimulant It forms urea on dehydration Cf *a carbonate carbamate* **a carbazotate** a picrate **a carbonate** $(NH_4)_2CO_3\ H_2O$ = 114 1 Colorless plates, decomp 85, soluble in water, alcohol, or ether, used as a reagent **a carbonate acid** a bicarbonate **a carbonate carbamate** $NH_4HCO_3\ NH_4NH_2CO_2$ = 157 1 Hartshorn salt The ammonium carbonate of commerce White hard lumps or colorless crystals, m 85 (sublimes), soluble in 5 pts of water and slightly soluble in alcohol It should contain not less than 30 % and not more than 32 % ammonia Used as a reagent in separating the alkali earth metals from magnesium (separating antimony and arsenic and Cl, Br, and I), and also as a heart stimulant in the treatment of pneumonia and phthisis, also externally as lotions, and in the manufacture of cocoa, baking powder, rubber goods and in the dye industry **a caseinate** Eucasin A white powder, soluble in water, either *mono-* or *di-* (0 011 % or 0 022 % NH_3, respectively) **a chloraurate** a aurichloride **a chlorate** NH_4ClO_3 = 101 50 Colorless, monoclinic crystals, $d_{17°}$ = 1 520, soluble in water or alcohol It is explosive **a chloride** NH_4Cl = 53 5 Sal ammoniac, salmiac, ammoniak Colorless, regular or tetragonal crystals, or a white granular powder, d 1 52 It dissociates at 350 and sublimes without melting, soluble in water or alcohol Used as a reagent in qualitative analysis for separation and precipitation, and for the determination of uric acid, medicinally as an expectorant, stimulant, diuretic or diaphoretic, and externally, as a cooling and stimulating wash for contusions, also for filling dry batteries, for soldering flux and in textile printing **a chloroiridate** a iridichloride **a chloropalladate** $(NH_2)_2PdCl_6$ = 355 54 Ammonium palladic chloride Brown crystals, d 2 418, decomp when heated, sparingly soluble in water **a chloropalladite** $(NH_4)_2PdCl_4$ = 284 62 Ammonium palladous chloride Bright red crystals, soluble in water **a chloroplatinate** $(NH_4)_2PtCl_6$ = 444 1 Yellow regular crystals, d 3 034, decomp when heated, nearly insoluble in water, and used as reagent **a chloroplatinite** $(NH_4)_2PtCl_4$ = 373 12 Yellow, regular crystals, nearly insoluble in water or alcohol **a chlorostannate** $(NH_4)_2SnCl_6$ = 367 5 White crystals, soluble in water **a chromate** $(NH_4)_2CrO_4$ = 152 1 Yellow, monoclinic crystals or needles, d 1 866, decomp 185, soluble in water Used as a reagent and as mordant in dyeing *acid-* see ammonium bichromate **a chromic sulfate** $Cr_2(SO_4)_3(NH_4)_2SO_4,\ 24H_2O$ = 956 71 Green octagonal crystals, soluble in water **a citrate** $(NH_4)_3C_6H_5O_7$ = 243 2 White deliquescent powder, soluble in water, used as reagent and for determining phosphates in fertilizers **a crystals** a carbonate carbamate **a cuprate** A deep blue ammoniacal solution of cupric hydroxide, used for waterproofing fabrics **a cyanate** NH_4CNO = 60 1 Colorless crystals, soluble in cold water and decomp in hot water **a cyanide** NH_4CN = 44 1 Colorless, regular crystals, decomp 37, soluble in water or alcohol **a dichromate** a bichromate **a dithiocarbamate** $NH_2\ CS\ CNH_4$ = 90 1 Yellow prisms, soluble in water **a dithiocarbonate** $NH_4S\ CO\ SH$ = 111 1 Yellowish crystals, used as a substitute for hydrogen sulfide in qualitative analysis **a dithionate** $(NH_4)_2S_2O_6$ = 196 20 Colorless, monoclinic crystals, d 1 704, soluble in water and insoluble in alcohol **a embeliate** $NH_4C_9H_{13}O_3$ = 187 1 A violet-gray powder, soluble in water or dilute alcohol and used as a taeniacide **a ethyl sulfate** $(NH_4)(C_2H_5)SO_4$ = 143 1 Colorless crystals, m 99, soluble in water, alcohol or ether **a ferrichloride** Ferric a chloride **a ferricitrate** Ferric a citrate **a ferric oxalate** $(NH_4)_3Fe(C_2O_4)_3\ 4H_2O$ = 446 06 Light gray crystals, d 1 778 decompose 165, soluble in alcohol or water **a ferricyanide** $2(NH_4)_3Fe(CN)_6\ H_2O$ = 550 05 Red crystals, soluble in water, and used as a reagent **a ferrocyanide** $(NH_4)_4Fe(CN)_6\ 3H_2O$ = 338 20 Greenish-yellow crystals, soluble in water and used as a

reagent **a fluoride** NH_4F = 37 0 Malt salt Colorless, hexagonal crystals which sublime if heated and are readily soluble in water or alcohol Used as a reagent in the analysis of silicates, medicinally as an alterative or antiperiodic, and for etching glass **a fluoride acid** Ammonium bifluoride **a fluosilicate** $(NH_4)_2SiF_6$ = 158 18 Colorless rhombic crystals, d 1 970, soluble in water **a formate** $HCOONH_4$ = 63 06 Colorless crystals, d 1 266, m 116 decomp 180, soluble in water and used as an antiseptic **a gallate** $NH_4C_7H_5O_5 \cdot H_2O$ = 205 13 A yellowish crystalline powder, soluble in water **a glycerophosphate** $(NH_4)_2PO_4C_3H_5(OH)_2$ = 206 Colorless crystals soluble in water and used for treating influenza **a hepta molybdate** a molybdate **basic a hippurate** $NH_4H(C_9H_8O_3N)_2 \cdot H_2O$ = 393 3 Colorless crystals, soluble in alcohol or water **a hydrogen fluoride** a bifluoride **a hydrogen phosphate** a phosphate **a hydrosulfide** NH_4HS = 51 1 Colorless crystals soluble in water, used in solution as a reagent for metals **a hydrosulfide solution** A solution prepared by passing H_2S through ammonium hydroxide A colorless or slightly yellow liquid of alkaline reaction, used as a reagent **a hydroxide** NH_4OH = 35 1 A hydrate of ammonia, crystalline below −79, otherwise only known in solution as *ammonia water*, q v Cf *quarternary amines, hydroxylammonium compounds* **a hypophosphite** $NH_4H_2PO_2$ = 83 10 White rhombic crystals, d 2 515, m 100 decomp 240, soluble in water or alcohol, and used as nerve tonic **a hyposulfide** a thiosulfite **a hyposulfite** $(NH_4)_2S_2O_3$ = 148 2 Ammonium thiosulfate Colorless crystals, soluble in water or alcohol and used as an antiseptic **a ichthyolsulfonate** Ichthyol **a iodoxyl benzoate** Amiodoxyl benzoate **a iron chloride** An orange powder, soluble in water, consists of a mixture of 2 5 % $FeCl_3$ and 97 5 % NH_4Cl Used in anemia, chlorosis and scrofulosis **a iodate** NH_4IO_3 = 192 96 Colorless, rhombic crystals, decomp 125, soluble in water or alcohol **a iodide** NH_4I = 144 96 Colorless regular crystals or powder, d 2 505, sublimes when heated soluble in water or alcohol It is a reagent for acetone and used in the treatment of syphilis, rheumatism scrofula, and leprosy, also in photography **a iridichloride** $(NH_4)_2IrCl_6$ = 441 9 a chloroiridate, **a** iridic chloride A red powder, d 2 856, slightly soluble in water **a lactate** $NH_4C_3H_5O_3$ = 107 1 A colorless syrupy liquid, d 1 19, miscible with water or alcohol **a linoleate** $C_{17}H_{31}COONH_4$ = 297 2 A soft mass used as an emulsifier for fats and waxes, for waterproofing glazing and polishing **a magnesium arsenate** $MgNH_4AsO_4 \cdot 6H_2O$ = 289 4 Colorless tetragonal crystals, d 1 65, decomp if heated, slightly soluble in water or acids, but insoluble in alcohol **a magnesium phosphate** $MgNH_4PO_4, 6H_2O$ = 245 6 Colorless tetragonal crystals, d 1 65, slightly soluble in water **a malate** $NH_4C_4H_5O_5$ = 151 08 Rhombic crystals d 1 5, m 161, soluble in water **a mono-magnesium phosphate** $Mg(NH_4)_4(PO_4)_2$ = 286 3 **a mellitate** $C_6(COONH_4)_6 \cdot 9H_2O$ = 606 Colorless crystals soluble in water Used as an emulsifier for fats and waxes, in waterproofing, glazing and polishing **a metaborate** a biborate **a meta phosphate** See *a phosphate* **a meta vanadate** a vanadate **a molybdate** $(NH_4)_2MoO_4$ = 196 1 Colorless monoclinic crystals, d 2 60, decomp by water, insoluble in alcohol and soluble in acids Used as a reagent, and in the manufacture of pigments *basic-* $(NH_4)_6Mo_7O_{24} \cdot 4H_2O$ = 1236 6 Ammonium heptamolybdate Greenish-yellow crystals, d 2 498, decomp if heated, soluble in ammonium chloride solution Used as a reagent and in the preparation of pigments **a molybdate solution** (6 %) A clear colorless or slightly yellow liquid with strong acid reaction and slight odor of HNO_3, used as a reagent for orthophosphates and arsenates **a mucinate** $(NH_4)_2C_6H_8O_8$ = 244 Colorless crystals, soluble in water **a muriate** a chloride **a nickel sulfate** Nickel ammonium sulfate **a nitrate** NH_4NO_3 = 80 1 German saltpeter, Norway saltpeter Colorless tetragonal crystals or granular powder, d 1 725, m 170, decomp 200, very soluble in water and slightly soluble in alcohol Used as an oxidizing agent, as a flux for metals, in the preparation of laughing gas in freezing mixtures and in explosives **a nitrite** NH_4NO_2 = 64 1 Colorless crystals, d 1 69, decomp when heated, into water and nitrogen, soluble in water or alcohol **a nitrosophenyl hydroxylamine** Cupferron **a oleate** $(NH_4)C_{18}H_{33}O_2$ = 317 Ammonia soap A jelly-like colorless mass, soluble in alcohol or ether and used as a cleanser **a oxalate** $(COONH_4)_2 \cdot H_2O$ = 142 1 Colorless prisms, d 1 502, soluble in 25 parts water used as a reagent in the separation of Ca Co, Zr, Th, Sr, as a precipitant for Ba, Zn, Pb, and in determination of quinine **a oxalate acid** a bioxalate **a oxalurate** $NH_4C_3H_3N_2O_4$ = 149 Pale yellow crystals, soluble in hot water **a oxaminate** $NH_2CO\,COONH_4$ = 106 1 Colorless crystals, soluble in water **a pallidichloride** a chloropalladate **a palmitate** $NH_4C_{16}H_{31}O_2$ = 274 Soft masses, soluble in alcohol or water, used as a cleanser **a perchlorate** NH_4ClO_4 = 117 5 White rhombic prisms, d 1 95, decomp when heated, soluble in water It is a constituent of explosives **a perchromate** $(NH_4)_3CrO_8$ = 234 13 Yellow rhombic crystals, decomp 50 soluble in water **a permanganate** NH_4MnO_4 = 137 1 Purple, rhombic crystals, d 2 207, decomp when heated, slightly soluble in water Used in pyrotechnics **a persulfate** $(NH_4)_2S_2O_8$ = 228 2 Colorless monoclinic crystals or a white granular powder, decomp when heated, soluble in water Used as a disinfectant, deodorant, in gargles, for the preservation of foods, as a reagent for albumen and indican, as an oxidizing agent in analysis for removal of organic matter, in the analysis of steel, in the separation of metals in photography, as a reducer, and in electroplating **a phenolsulfonate** $C_6H_4(OH)SO_3NH_4$ = 191 14 White crystals, soluble in water **a phenylate** $C_6H_5O\,NH_4$ = 111 1 White crystals soluble in water and used as an antiseptic and antipyretic **a phosphate** $(NH_4)_2HPO_4$ = 132 2 Diammonium-ortho-phosphate, ammonium diphosphate Colorless monoclinic crystals or white powder, d 1 619, soluble in 4 pts water It is a precipitant for Mg, Zn, Ni and U, used medicinally an antirheumatic, also as fertilizer and for fireproofing materials *mono-* a biphosphate, *tri-* a phosphate, tribasic *meta-* NH_4PO_3 = 97 8 Ammonium metaphosphate Colorless crystals, soluble in water **a phosphate monobasic** $NH_4H_2PO_4$ = 115 2

Monoammonium phosphate, ammo-phos Colorless powder, d 1 803, soluble in water, used as fertilizer **a phosphate tribasic** $(NH_4)_3PO_4 = 149\ 1$ Triammoniumphosphate Colorless crystals, soluble in water, used as a culture medium for spores and fungi **a phosphite** (1) *mono-* $NH_4H_2PO_3 = 99\ 10$ Colorless crystals, m 123, decomp 150, soluble in water (2) *di-* $(NH_4)_2HPO_3 = 116\ 1$ Diammonium phosphite Colorless crystals, soluble in water, used as a reducing agent **a phosphotungstate, a phosphowolframate** $(NH_4)_3PO_4\ 12WO_3\ 3H_2O = 1931\ 2$ Yellow crystals or powder slightly soluble in water, but soluble in alkalis or aqua regia, used as a reagent for alkaloids **a phthalate** $C_6H_4(COONH_4)_2 = 200\ 2$ Colorless crystals, soluble in water **a picramate** $C_6H_2NH_2(NO_2)_2\ ONH_4 = 216\ 09$ Reddish-yellow crystals, soluble in water and used in bacteriology **a picrate** $NH_4C_6H_2O(NO_2)_3 = 246$ Ammonium carbazotate, ammonium picronitrate Yellow, explosive crystals, d 1 719, decomp if heated, soluble in water or alcohol, and used for explosives **a picrocarminate solution** A dark red staining solution used for the differentiation of the nucleus and cytoplasm of cells **a picro nitrate** a picrate **a platinic bromide** $(NH_4)_2PtBr_6 = 710\ 80$ Ammonium bromoplatinate Red, regular crystals, decomp when heated, slightly soluble in water **a platinic chloride** $(NH_4)_2PtCl_6 = 444\ 0$ Yellow hygroscopic crystals, soluble in water and used as reagent **a purpurate** Murexide **a pyrophosphate** $(NH_4)_4P_2O_7 = 246\ 3$ White crystals soluble in water **a rhodanate** a thiocyanate **a salicylate** $NH_4C_7H_5O_3 = 155\ 1$ White monoclinic crystals, soluble in water or alcohol and used as an antirheumatic, antipyretic, expectorant and bactericide **a selenate (acid)** $NH_4HSeO_4 = 162\ 2$ Colorless crystals, soluble in water **a selenate (normal)** $(NH_4)_2SeO_4 = 179\ 28$ White crystalline masses, soluble in water **a selenite** $(NH_4)_2SeO_3 = 163\ 2$ White crystals, soluble in water, and used as a reagent for alkaloids and for producing red glass **a sesquicarbonate** $2NH_4CO_3(NH_4)_2CO_3H_2O = 272\ 2$ White crystals, decomp if heated **a silicofluoride** $(NH_4)_2SiF_6 = 178\ 07$ Colorless crystals or white powder, soluble in water, used as an antiseptic **a silvinate** $NH_4C_{20}H_{29}O_2 = 319$ A yellow microcrystalline powder, slightly soluble in water or alcohol **a sozoiodate** Colorless crystals, soluble in water **a stannic chloride** a chlorostannate **a stearate** $C_{17}H_3\ COONH_4 = 301$ A soft, white soap-like mass soluble in hot alcohol **a succinate** $C_2H_4(COONH_4)_2 = 152\ 2$ Colorless crystals, soluble in water and used in gynecology **a sulfate** $(NH_4)_2SO_4 = 132\ 2$ Colorless rhombic crystals or white granular powder, d 1 77, m 140, decomp at 280, and soluble in 2 pts of water but insoluble in alcohol Used as a precipitant for proteins, for the separation of Ca and Sr, and in the manufacture of fertilizers *acid-* a bisulfate **a sulfhydrate** a hydrosulfide **a sulfide** $(NH_4)_2S = 68\ 2$ White crystals, decomp when heated, and soluble in water but insoluble in alcohol, used as a reagent **a sulfide solution** An aqueous solution of a hydrosulfide **a sulfite** $(NH_4)_2SO_3\ H_2O = 134\ 2$ White monoclinic crystals, decomp when heated, and soluble in water Used as an antiseptic in dispepsia and skin diseases *acid-* a bisulfite **a sulfocarbonate solution** A liquid prepared from ammonium carbonate and carbon disulfide, used as an insecticide and parasiticide **a sulfocyanate** a thiocyanate **a sultoichthyolate** Ichthyol **a sulfophenylate** $C_6H_4OH\ SO_3NH_4 = 191$ A sulfocarbolate Colorless crystals, soluble in water, and used as an antiseptic **a sulphate** a sulfate **a tartrate** $C_2H_4O_2(COONH_4)_2 = 184$ Colorless monoclinic crystals d 1 601, occurring in two forms having refractive index $\alpha = 1\ 55$ and $\beta = 1\ 581$, soluble in water Used as an expectorant, and in the textile industry *acid-* a bitartrate, a hydrogen tartrate, $NH_4HC_4H_4O_6 = 167\ 08$ Monoclinic prisms, d 1 636 having refractive indices of 1 519, 1 561 and 1 591, soluble in water **a tellurate** $(NH_4)_2TeO_4 = 227\ 2$ A white powder, soluble in acids, a reagent for glucosides and alkaloids **a thioacetate** $CH_3COSNH_4 = 93\ 2$ Slightly yellow crystalline masses soluble in water and used as a reagent **a thioacetate solution** A 30 % aqueous solution, used as a reagent in organic analysis and as a substitute for hydrogen sulfide **a thiocarbonate** $(NH_4)_2CS_3 = 144\ 27$ Yellow crystals, soluble in water and insoluble in alcohol or ether **a thiocyanate, -ide** $NH_4CNS = 76\ 1$ a rhodanate Colorless deliquescent, monoclinic crystals, d 1 3057, m 159, at 170 it changes into thiourea, soluble in water or alcohol It is a reagent for Fe As, Sb Hg, Ag Cu, and the halogens and is also used in the dye and textile industry **a thionurate** $(NH_4)_2C_4H_3N_3SO_6 = 257$ White crystals, soluble in water **a thiostannate** $(NH_4)_2SnS_3 = 251$ **a thiosulfate** $(NH_4)_2S_2O_3 = 148\ 21$ a hyposulfite Colorless rhombic crystals, decomp 150, soluble in water, insoluble in alcohol or ether **a triborate** $NH_4H(BO_2)_2 = 105\ 1$ Ammonium acid borate Colorless crystals soluble in water **a tungstate** $(NH_4)_2WO_4 = 284\ 1$ a wolframate Colorless crystals, soluble in water, but insoluble in alcohol *meta-* $(NH_4)_2W_4O_{18}\ 8H_2O = 1204\ 4$ a metawolframate Colorless, octahedral crystals, which lose 7 mol water at 100°C, soluble in water *ortho-* $(NH_4)_2W_2O_{18}\ 8H_2O = 3276\ 2$ a orthowolframate Colorless crystals, soluble in water *para-* $(NH_4)_6W_7O_{24}\ 6H_2O = 1888\ 3$ a parawolframate Colorless rhombic crystals, which lose 4 mol water at 100°C, slightly soluble in water The ammonium tungstates are used in the preparation of ammonium phosphotungstate **a uranate** $(NH_4)_2UO = 627\ 2$ A yellowish-red amorphous powder, soluble in acids and used in ceramics for coloring porcelain **a uranylcarbonate** *Uranyl* ammonium carbonate **a uranylfluoride** *Uranyl* ammonium fluoride **a urate** $(NH_4)C\ H_3N_4O_3 = 185\ 1$ Colorless crystals or white powder, soluble in water and used as an antiseptic **a valerate** $C_4H_9\ COONH_4 = 119\ 1$ Colorless, hygroscopic crystals, soluble in water, alcohol or ether, used as a hypnotic sedative and tonic **a valerianate** a valerate **a vanadate** $NH_4VO_3 = 155\ 2$ A colorless powder, soluble in water and used in the textile industry, in the manufacture of vanadium catalysts, blue or green photographic dyes, indelible ink, and in ceramics **a wolframate** a tungstate

ammono Pertaining to the *ammonia* system, q v **a base** An inorganic amide, MNH_2 Cf *base, ammonio* **a salt** Cf *ammonia* system

ammonocarbonous acid Hydrocyanic acid

ammonolysis (1) A reaction in the ammonia system which corresponds with the hydrolytic dissociation $NH_3 \rightarrow H^+ + NH_2^-$ (2) The cleavage of a bond by the addition of ammonia, $R—R' + NH_3 \rightarrow RNH_2 + HR$ (3) Treatment (e g of oils) with hot ammonia gas under pressure

ammo-phos A commercial ammonium phosphate containing 13 % NH_3 and 48 % available P_2O_5, used as fertilizer

amniotin Oestrone

amœba, amoeba Ameba

amoeboid Resembling an ameba **a cell** A leucocyte **a movement** The motion of a unicellular organism consisting of a streaming or rolling movement of the protoplasmic jelly

amoil Amylphthalate used for high-vacuum pumps

amorphism The non-crystalline condition of a solid substance, due to an irregular molecular assembly

amorphous Unorganized The property of a solid substance which does not crystallize and is without any definite geometrical shape In bacteriology, any bacteria without visible differentiation in structure

amosite A long-fibred variety of asbestos, from the Transvaal

amoxy Amyloxy The monovalent radical, $Me-(CH_2)_4O—$ derived from amyl alcohol

ampelite A sulfur-containing earth

Ampère, André Marie 1775–1836 A French physicist and mathematician, noted for the development of molecular theory

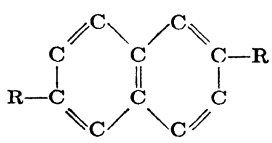
ampere The practical unit of amount of electricity and current One ampere is the strength of a current which, on passing through silver nitrate solution, will deposit 0 001118 gram of silver per second, or, the strength of a current with an electromotive force of one volt passing through a resistance wire (or solution) of one ohm 1 ampere = 1 coulomb per second = 1 volt through 1 ohm = 10^{-1} E M U (C G S) = 3×10^9 E S U **international-** 1 Int a = 0 9999 absolute **a micro-** One-millionth of an a **milli-** One-thousandth of an a **meter** Ammeter An instrument for measuring electric current Cf *voltammeter, ohmammeter* **a turn** An ampere of electricity flowing through one turn of a coil **a volt** A volt-ampere or a watt

amperometer Ampere meter

amperometry Chemical analysis by methods which involve measurements of electric currents *e g* conductometric analysis, q v Cf *polarography, potentiometry*

ampheramine Benzedrine

amphi A prefix derived from the Greek "on both sides," or "both" **a position** The positions of the hydrogen atoms in the 2 6-position of two condensed hexatomic rings (*e g*, naphthalene ring)



amphiaster A stage during cell division which occurs shortly before nuclear division

amphiboles A group of rock-forming minerals, which contain occluded water, of the general type, $M_x(Si_2O_3)_y$, in which M is Ca, Mg, Fe, or the alkali metals (hornblende, tremolite, anthophyllite, crocidolite, etc) They occur in elongated fibrous form, as black or dark green crystals Cf *silica* minerals

amphibolites A group of metamorphic rocks derived from argillaceous limestones and related to the glaucophane schists

amphichroic, amphichromatic A mixture of indicators whose color changes neutralise one another, *e g*, litmus and congo red

amphigene Leucite

ampholyte Amphoteric electrolyte A substance which in solution yields H^+ or OH^-, according to the pH value of the solvent Cf *isoelectric* point, *zwitterion*

ampholytoid Amphoteric colloid A particle which, when in suspension, is capable of adsorbing either H^+ or OH^-, depending upon the pH value of the suspending media At the isoelectric point the particles are electrically neutral

ampho-magenta An indicator changing at pH 4 5 from red (acid) to blue and at pH 8 5 from blue to red (alkaline)

amphoteric A substance having both, acid and basic properties Thus it may act either as a weak acid or as a weak base, as, aluminum hydroxide, $Al(OH)_3 \rightleftharpoons H_3AlO_3$, or the amino-acids, $NH_2 R COOH$ **a hydroxides** The hydroxides of some metals which may dissociate to H^+ or OH^- ions, as, $2Al(OH)_3 \rightleftharpoons \begin{cases} H^+ + AlO_2 + H_2O \text{ (acid)} \\ Al^{+++} + 3OH^- \text{ (base)} \end{cases}$ **a sulfides** The sulfides of the metallic nonmetals, which may react as weak acids or weak bases, *e g*, $H_3AsS_3 \rightleftharpoons As(SH)_3$

amphotropine $[(CH_2)_6N_4]_2 C_8H_{14}(COOH)_2 = 480$ Hexamethylenamine camphorate A colorless crystalline powder

amplification An increase or enlargement *e g*, of the visual area (microscope) or of sound (telephone)

amplifier (1) A magnifier (2) A vacuum tube acting as an electric valve, by which weak electric impulses are strengthened, as in radio transmission or reception

amplitude The maximum displacement of an oscillation, vibration or wave

ampoule, ampul The small, sealed, glass vial that contains a sterilized solution for hypodermic injections

ampydin A brand of amidopyrine

amrad gum A gummy exudation from elephant apple, *Feronia Elephantum*, a Rutaceae of India and Java

amyctic An irritating stimulant, used especially on the skin

amygdala The seeds of *Prunus amygdalus*, containing emulsin and amygdalin **a amara** See bitter *almond* **a dulcis** See sweet *almond*

amygdalic acid (1) Mandelic acid (2) $C_{20}H_{28}O_{13} = 476\ 22$ Gentiobioside A glucoside from almonds

amygdalin $C_{20}H_{27}O_{11}N\ 3H\ O = 511\ 37$ *d*-Mandelonitrile glucoside, amygdaloside A glucoside from bitter almonds, wild cherry bark, and other drugs Colorless, odorless, tasteless crystals, m 210, soluble in water,

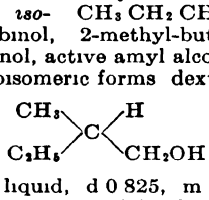
slightly soluble in alcohol and insoluble in ether It hydrolyses to 2 mol glucose, HCN and Ph CHO, and is used as an expectorant, it is a source of oil of bitter almonds

amygdalinic acid Mandelic acid

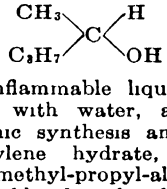
amygdaloid Shaped like an almond

amygdophenin $C_{16}H_{17}O_3N$ = 271 2 Phenetidine amygdalate, phenyl-glycol-phenetidine $C_6H_4O\,C_2H_5NH\,CO\,CHOH\,C_6H_5$ A grayish-white, light, crystalline powder, used medicinally as an analgesic

amyl Am Pentyl The monovalent —C_5H_{11} radical derived from pentane iso- i-Am The monovalent —C_5H_{11} radical derived from isopentane **tert-** The monovalent radical $MeCH_2$(Me$_2$)C—, derived from pentane **a cetate** $MeCOOC_5H_{11}$ = 130 13 Isoamyl acetate, i-amylacetic ester, banana oil, pear oil, pentylacetate, amylacetic ester A colorless, inflammable liquid, d 0 8659, b 148, sparingly soluble in water and miscible with alcohol or ether Used in making fruit ethers for the soda fountain and as a solvent for nitrocellulose, for varnishes and lacquers, for waterproofing materials, metallic paints, and liquid bronzes, also used as fuel for the Hefner standard candle **a acetic ether** Amyl acetate **a alcohol** $C_5H_{11}OH$ = 88 11 Fused oil, grain oil potato spirit, fermentation amyl alcohol, amyl hydroxide, $CH_3(CH_2)_4OH$ A colorless liquid, d 0 870, m —134, b 137 5, miscible with alcohol It is a mixture of several isomeric alcohols (see table) and is used as a solvent and reagent in the preparation of chemicals and pharmaceuticals, artificial silk, varnishes, lacquers, mercury fulminate, and in photography *active-* See iso- or secondary- *alpha-* See secondary- *beta-* See tertiary- *dextro-* See iso- or secondary- *iso-* $CH_3\,CH_2\,CH(CH_3)CH_2OH$ Isobutyl-carbinol, 2-methyl-butyl-alcohol, 2-methyl-butanol, active amyl alcohol It occurs in two stereoisomeric forms dextro- and levo-



A colorless liquid, d 0 825, m —117 b 131 6, the chief constituent of fusel oil or fermentation amyl alcohol *levo-* See iso- or secondary- *normal-* See primary- *primary-* Butyl carbinol, normal amyl alcohol, *1*-pentanol* A colorless liquid, d 0 817, m —78 b 137–138, soluble in water, alcohol or ether *secondary-* Alpha-amyl alcohol, secondary butyl carbinol, 1-methyl-butanol*, 1-methyl-butyl alcohol, *2*-pentanol* It occurs in a dextro-, and levo-form



A colorless inflammable liquid, d 0 8169, b 118 miscible with water, alcohol or ether, used in organic synthesis and as a solvent *tertiary-* Amylene hydrate, dimethyl-ethyl-carbinol, 1-dimethyl-propyl-alcohol A colorless inflammable liquid, d 0 8144, m —12 b 102, soluble in water, alcohol or ether, used in organic synthesis and in the preparation of fruit ethers **a aldehyde** Valeraldehyde **a amine** $C_5H_{11}NH_2$ = 87 14 **n-** Normal amylamine, pentylamine*, *1*-aminopentane A colorless liquid, d 0 766, b 104, miscible with water, alcohol or ether **iso-** A colorless liquid, d 0 750, b 95, soluble in water, alcohol or ether Used as an emulsifying agent and in dye manufacture Cf *diamyl-*amine, *triamyl*amine *methyl-* Iso*hexylamine* **a amine hydrochloride** $C_5H_{11}NH_2\,HCl$ = 123 5 Colorless crystals, soluble in water and used as an antipyretic **a aniline** (iso) $PhNHC_5H_{11}$ = 163 20 A liquid, $d_{15°}$ 0 928, b 260 **a benzene** $C_5H_{11}\,C_6H_5$ = 148 18 Phenylpentane A colorless liquid d 0 860, b 201, soluble in alcohol **a benzoate** $C_6H_5COOC_5H_{11}$ = 192 19 **n-** A colorless liquid, d 1 004, b 260, soluble in alcohol **iso-** A colorless liquid, d 0 993, b 262, insoluble in water and soluble in alcohol **a bromide** $C_5H_{11}Br$ = 151 03 **n-** *α*-bromopentane, *1*-bromopentane* A colorless liquid $d_{20°}$ = 1 223, b_{740mm} = 128 7, soluble in alcohol **i-** *β*-brompentane A colorless liquid, d 1 219, b 120, insoluble in water and soluble in alcohol and used as an antiseptic **a butyrate** $C_3H_7COOC_5H_{11}$ = 158 19 *i-amyl-n-butyrate* i-amyl butyric ester A colorless liquid, $d_{0°}$ = 0 882, b 178 5, slightly soluble in water and soluble in alcohol or ether It is used in fruit ethers *n-amyl-i-butyrate* A colorless liquid, d 0 859, b 154, slightly soluble in water, miscible with alcohol or ether It is used in organic synthesis and in the preparation of artificial fruit essences *i-amyl-i-butyrate* A colorless liquid, $d_{0°}$ = 0 876, b 168 8, miscible with alcohol or ether **a carbamate** $C_5H_{11}CO_2NH_2$ = 131 Amyl-carbamic ester, amyl urethane Colorless crystals, m 60, b 220, soluble in alcohol or ether Cf *aponal*, *hedonal* **a carbinol** Hexyl alcohol **a carbylamine** $C_5H_{11}NC$ = 97 13 A liquid, b 137, soluble in alcohol but insoluble in water **a chlorcarbonate** $ClCOOC_5H_{11}$ = 150 58 **iso-** A colorless liquid, $d_{25°}$ = 1 024, b 100, insoluble in water, miscible with alcohol or ether **a chloride.** $C_5H_{11}Cl$ = 106 57 **n-** *α*-chloropentane, *1*-chloropentane* A colorless liquid, $d_{20°}$ = 0 883, b_{740mm} = 106 5, miscible with alcohol **iso-** *β*-chloropentane A colorless liquid, d 0 880, b 100, insoluble in water and miscible with alcohol or ether **a cyanide** $C_5H_{11}CN$ = 97 13 Capronitrile A colorless liquid, d 0 807, b 163, insoluble in water and miscible with alcohol or ether **iso-** Isocapronitrile A colorless liquid, d 0 806, m —51, b 155 **a ether** $(C_5H_{11})_2O$ = 158 23 **n-** *α*-amyl oxide, pentyloxypentane*, di-*n*-amylether, pentyloxide A yellowish liquid, $d_{25°}$ = 0 775, b 169, insoluble in water and miscible with alcohol or ether **iso-** i-amyl oxide A colorless liquid, d 0 781, b 173, insoluble in water but miscible with ether Used as a solvent **a ethyl ketone** $C_2H_5COC_5H_{11}$ = 128 17 3-octanone A liquid, $d_{0°}$ 0 8502, b 164 **a formate** $HCOOC_5H_{11}$ = 116 13 **n-** n-amyl formic ester A colorless liquid, $d_{0°}$ = 0 894, b 123 2, slightly soluble in water but miscible with alcohol or ether **iso-** i-amyl formic ester A colorless liquid, d 0 9018, b 130, slightly soluble in water and miscible with alcohol or ether It is used in fruit essences and syrups **a furoate** $C_4H_3O\,COOC_5H_{11}$ = 182 11 **n-** A colorless liquid, d 1 0335, b 233, used in perfumery and lacquers **i-** b_{25mm}136 **a hydrate** See *amyl* alcohols **a hydride** Pentane **a hydrosulfide** Amyl mercaptan **a iodide** $C_5H_{11}I$ =

AMYL ALCOHOLS

(The asymmetric C atom of No 3 and 7 is in heavier type)

A Primary

(1) 1-pentanol* $CH_3CH_2CH_2CH_2CH_2OH$
d 0 817, m −78 5 b 137 9
normal amyl alcohol, butylcarbinol, pentan-1-ol

(2) 3-methyl-1-butanol* $CH_3CHMeCH_2CH_2OH$
d 0 812, m −117 2, b 130 5
iso-amyl alcohol, prim isobutylcarbinol, 2-methyl-butan-4-ol, 3-methyl-butan-1-ol

(3) 2-methyl-1-butanol* $CH_3CH_2CHMeCH_2OH$
d 0 816, m 128
d-amyl alcohol, sec butylcarbinol, 2-methyl-butan-1-ol

(4) 2 2-dimethylpropanol* $CH_3CMe_2CH_2OH$
m 53, b 114
isobutylcarbinol, tert butylcarbinol,

B Secondary

(5) 2-pentanol* $CH_3CH_2CH_2CHMeOH$
d 0 809, b 119
sec amyl alcohol, methylpropylcarbinol, 1-methyl-1-butanol, pentan-2-ol

(6) 3-pentanol* $CH_3CH_2CHOHCH_2CH_3$
d 0 815, b 115 6
diethylcarbinol, 1-ethyl-1-propanol, pentan-3-ol

(7) 3-methyl-2-butanol* $CH_3CHMeCHMeOH$
d 0 819, b 114
methylisopropylcarbinol, 1 2-dimethyl-1-propanol, 3-methyl-butan-2-ol

C Tertiary

(8) 2-methyl-2-butanol* $CH_3CH_2CMe_2OH$
d 0 809, m −11 9, b 101 8
tertiary amyl alcohol, dimethylethylcarbinol, amylene hydrate, 1 1-dimethyl-1-propanol, 2-methyl-butan-2-ol

198 03 **n-** n-Iodopentane *1-*Iodopentane* A colorless liquid, $d_{20°}$ = 1 517, b_{739mm} = 155 4, miscible with alcohol **iso-** 1-Iodopentane A colorless liquid, $d_{20°}$ 1 473, b 148 2, insoluble in water and miscible with alcohol or ether, used as a sedative and antiseptic, and for inhalations **a isobutyrate** Amyl-1-butyrate **a isocyanide** C_6H_{11} = 97 09 Pentylcarbylamine*, $Me(CH_2)_4CN$ Colorless liquid, d-0 806, m −51, b 155 **a ketone** 6-Hendecanone **a mercaptan** $C_5H_{11}SH$ = 104 14 1-Pentanethiol* A liquid $d_{0°}$ 0 8548, b 116, used as an odorant for natural gas and in organic synthesis Cf *diamyl* sulfide **a methyl ether** $C_5H_{11}OCH_3$ = 102 14 A liquid d 0 7807, b 92 **a mustard oil** $C_5H_{11}NCS$ = 129 21 1- 1-amyl-1-thiocyanate A colorless liquid, d-0 942, b 184, sparingly soluble in water and miscible with alcohol or ether **a nitrate** $C_5H_{11}NO_3$ = 133 16 **iso-** A colorless liquid, $d_{7°}$ = 1 000 b 147, slightly soluble in water and miscible with alcohol or ether It is used as an antimalarial **a nitris** Amyl nitrite **a nitrite** $C_5H_{11}NO_2$ = 117 10 Pentylnitrite* **n-** A pale yellow, inflammable liquid, d 0 870, b 96 insoluble in water **iso-** A colorless liquid d 0 880 b 94, slightly soluble in water, but miscible with alcohol or ether Used as an antispasmodic and as a reagent for phenols and wormseed oil, also in the manufacture of perfumes **a oxide** Amyl ether **a oxyhydrate** Amyl alcohol **a phenol** $C_5H_{11}C_6H_4OH$ = 164 18 1-amyl-p-phenol, 1-amyl-4-hydroxy-benzene White needles, m-94, b 265, slightly soluble in water but soluble in alcohol or ether, used in the manufacture of synthetic resins, and for varnishes and antiseptic emulsions **a phenyl hydrazine** $NH_2NPhC_5H_{11}$ = 178 16 Colorless liquid, b 175, used as reagent for aldehydes **a phenyl ketone** $C_5H_{11}COC_6H_5$ = 176 19 A colorless liquid, b 242, insoluble in water but miscible with alcohol or ether **a phthalate** $C_6H_4(COOC_5H_{11})_2$ = 306 46 Amoil Colorless crystals b_{11mm} = 205, used in *vacuum* pumps, q v , instead of mercury **a propionate** $C_2H_5COOC_5H_{11}$ = 144 17 A colorless liquid $d_{0°}$ = 0 888, b 160 sparingly soluble in water but miscible with alcohol or ether **a rhodanate** a thiocyanate **a salicylate** $C_6H_4(OH)COOC_5H_{11}$ = 208 19 **n-** A colorless liquid d-1 052 b 276 5, soluble in water **iso-** A colorless liquid $d_{25°}$ = 1 045 b 270, insoluble in water, but miscible with alcohol ether, or chloroform Used as an antirheumatic and commercially in fruit essences **a sulfate** $(C_5H_{11})_2SO_4$ = 238 23 Pentylsulfate di-*n*-amylsulfate Colorless liquid, d 1 026, $b_{2\ 5mm}$ 117, decomposed by water **a sulfocyanate** a thiocyanate **iso-** amyl rhodanate A colorless liquid, $d_{20°}$ = 0 905, b 197, miscible with alcohol or ether **a sulfide** $(C_5H_{11})_2S$ = 174 18 **n-** A colorless liquid d 0 881 b 203 7 **iso-** A colorless liquid, $d_{20°}$ = 0 843, b 215, insoluble in water and miscible with alcohol or ether **a thiocyanate** a mustard oil $C_5H_{11}CNS$ = 129 21 **a urea** $NH_2CONHC_5H_{11}$ = 130 16 A white crystalline mass, m 90, slightly soluble in water **a urethane** $C_5H_{11}OCONH_2$ = 131 14 a carbamate, a carbamic ester A crystalline solid, m 65, b 220 soluble in water, alcohol or ether **a valerate** $C_4H_9COOC_5H_{11}$ = 172 **iso-** 1-amyl-valeric ester, apple essence apple oil A colorless liquid, d 0 8812, b 196, insoluble in water, miscible with alcohol or ether Used in the manufacture

of fruit ethers for soda water fountains, and medicinally as a sedative **a xanthate** The amyl ester of xanthic acid, used as a flotation reagent

amylan A laevo-rotatory gum in malt and barley $[\alpha]_D = -137\ 7$ It does not reduce Fehling's solution

amylase A starch-splitting or amylolytic enzyme in blood, hempseed or malt which hydrolyses polysaccharides to glucose **pancreatic-** Amylopsin **salivary-** Ptyalin **vegetable-** Diastase

amylate A compound of starch

amylene $C_5H_{10} = 70\ 11$ **n-** or **1-** Propyl ethylene, ethyl propylene, Δ^1-pentene, Δ^1-valerene, *1*-pentene*, $MeCH_2CH_2CH{=}CH_2$ A colorless inflammable liquid, b 40, insoluble in water and soluble in alcohol or ether **1-** or **2-** Ethyl-methyl-ethylene, Δ^2-pentene, Δ^2-valerene, *2*-pentene* A colorless inflammable liquid, b 36 5, insoluble in water and soluble in alcohol or ether There are three forms

Et C H	Et CH	Et C Me
‖	‖	‖
HC Me	Me C H	HCH
trans-	*cis-*	*asymmetric*

β-iso- Pentyl

a alcohol a alcohol tertiary- **a carbamate** Aponal **a bromide** $C_5H_9Br = 149\ 0$ A pale yellow liquid, d 1 550, b 105 (decomp) **a chloral** Dormiol **a diamine** Cadaverine **a ether** a oxide **a glycol** Pentanediol **a hydrate** See *amyl* alcohol **a hydride** Amylene **a iodide** $C_5H_9I = 196\ 00$ A yellow liquid, b 132 (decomp) **a oxide** (1) a ether The compound $(C_5H_9)_2O$ (2) Pentamethylene oxide, pentahydropyran The ring compound $C_5H_{10}O$, b 82 **a o linkage** In sugars and related compounds the formation of a ring by an O atom connecting the first and fifth carbon atom Cf *pyranose*

amylenum The official Latin for amylene

amyl hydride Pentane

amyl hydrate Amyl alcohol

amylic alcohol Amyl alcohol

amylidene The divalent radical, pentylidene, $Me(CH_2)_3CH{=}$, derived from pentane

amyline The cellulose membrane of starch granules

amylis The official Latin for amyl

amylit A diastatic enzyme of malt, used in the textile industry

amylo- Pertaining to starch (Gr amylum)

amylobacter A bacillus acting on starch and causing butyric acid fermentation

amylo-cellulose A starch-cellulose complex which encloses the starch granulose of plants

amyloclastic Amylolytic

amylodextrin Soluble *starch*

amyloform An antiseptic powder, used like iodoform, it is a mixture of starch and formaldehyde

amylogen A soluble starch

amylograph An instrument which measures the baking quality of starch in terms of its viscosity at various temperatures

amyloid (1) $(C_6H_{10}O_5)x = (162\ 11)x$ An explosive, m 42, slightly soluble in water (2) Parchment paper formed by the action of sulfuric acid on cellulose (3) A substance produced in woody tissues as an intermediate stage in the process of lignification

amyloin Malto-dextrin

amylolysis The conversion of starch into sugar either by boiling with dilute acids (hydrolysis), or by the action of enzymes

amylolytic Amyloclastic Capable of transforming starch into sugar **a activity** The digestive power of amylase **a enzyme** Amylase **a fermentation** See *fermentation*

amylopectin The gel constituent of starch paste Cf *amylose*

amylopsase See *amylopsin*

amylopsin, amylopsase An amylase of the pancreatic juice, splitting starch to glucose (*i e* , similar to diastase)

amylose (1) The sol constituent of starch paste Cf *amylopectin* (2) Polysaccharide **α-, β-** See *starch*

amylum (1) The Latin name for starch (2) Corn starch Cf *paramylum*

amyrin $C_{24}H_{39}O = 343\ 4$ A crystalline resinous substance occurring in elemi and other gums **α-** $C_{30}H_{50}O$ Ilicic alcohol

Amyris A genus of tropical trees and shrubs producing fragrant resins and gums, *e g* , *A elemifera* (elemi) of Mexico

amytal $C_{11}H_{18}O_3N_2 = 226\ 16$ 5-ethyl-5-iso-amylbarbituric acid Colorless crystals, m 156, used as anesthetic and sedative Cf *barbital*

amythin The ammonium salt of a mixture of sulfonated hydrocarbons

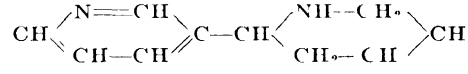
an- A prefix indicating, without or not

-an A suffix which indicates a sugar-body, glucoside or gum

An The symbol for *actinon*

ana- A prefix derived from the Greek which indicates, again, along, over, through, without, or against **a -position** The 1 5-position of the naphthalene ring, or the positions of the two hydrogen atoms attached to the first and fifth carbon atom of two condensed hexatomic rings, as, naphthalene, quinoline, etc

anabasine $C_{10}H_{14}N_2 = 162\ 12$ Neonicotine *1-2-*(*5*-pyridyl)piperidine An isomer of nicotine



from *Anabasis aphylla* a Chenopodiaceae of Central Africa A colorless liquid, d 1 048 b 28 1, soluble in water, used as insecticide

anabolism Synthetic metabolism The processes by which the compounds of food-materials are transformed into complex living matter or protoplasm

Anacardiaceae The cashew family, consisting of 60 genera and 500 species of trees or shrubs with gummy, milky, or resinous juices that are often poisonous, *e g* ,

Rhus toxicodendron	poison ivy poison oak
Rhus glabra	sumac
Rhus aromatica	sweet sumac
Pistacia lentiscus	mastic
Pistacia terebinthus	Chinese turpentine
Anacardium occidentale	cashew nuts
Semecarpus anacardium	oriental cashew nut

See also *Rhus quebracho mangiferin*

anacardic acid $C_{22}H_{30}O_3 = 344\ 3$ An acid from the seeds of *Anacardium occidentale* A brown crystalline mass, m 26 soluble in alcohol or ether, used as an anthelmintic

anacardium Cashew nut, caju nut The dried fruit of *A occidentale*, a large shrub of tropical

America, used as a refreshing food Cf *acajou* balsam, *cardol*

anaclastic. Having refracting powers

anæ See *anae* and *ane*

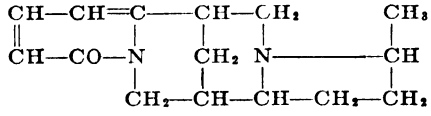
anaerobe A bacterium which can grow in an oxygen-free atmosphere and which derives the oxygen necessary for its metabolism from solid or liquid compounds **facultative-** A bacterium which prefers an atmosphere containing oxygen, but which is not dependent on gaseous oxygen for its metabolism **obligatory-** A bacterium which cannot live in an atmosphere containing oxygen

anaerobic Growing in an oxygen-free atmosphere **a culture apparatus** A glass container used for growing bacteria, from which the atmospheric oxygen is removed by chemicals, *e g*, pyrogallic acid

anaesthesia Anesthesia

anaesthesin(e) Benzocaine

anagyrine $C_{15}H_{18}ON_2$ = 242 2 An alkaloid from the seeds of *Anagyris foetida*, a Leguminosae A brittle, resin-like mass, b 245 It resembles cytisine and sparteine in structure



a hydrobromide $C_{15}H_{18}ON_2 HBr$ = 323 3 Colorless or slightly yellow crystals, m 265, soluble in water or alcohol, used as a heart stimulant

anahemin A polypeptide from the liver, which is responsible for the maturation of the red blood cells in the bone marrow

analcime Analcite

analcite $NaAlH_2Si_2O_7$ Analcime A native sodium aluminum silicate, a white isometric zeolite It is also deposited in high-pressure boilers

analeptic A drug which restores health

analgen(e) (1) $C_{18}H_{16}O_2N_2$ = 292 24 *5*-Benzamido-*8*-ethoxy-quinoline, o-ethoxy-mono-benzoyl-amidoquinoline, benzanalgen, quinalgene, labordin, $C_7H_5O\ NHC_6H_3(OEt)\ C_5H_5N$ Colorless crystals, m 208, insoluble in water but soluble in hot alcohol, used as an antipyretic, antirheumatic and analgesic (2) $C_{13}H_{14}O_2N_2$ = 230 12 5-acetylamino-8-ethoxy-quinoline Colorless crystals, m 155

analgesic A drug that relieves pain either by direct action on nerve centers (brain), or by diminishing the conductivity of the sensory nerve fibers

analgesine Antipyrine

analgic Painless

analgin Creolin

anallachrom Esculin

analogs, analogues Analogous series A group of compounds with similar electronic structures but different atoms, as, *isosteres* and *isologs*

analogy A similarity or a likeness in properties Cf *homology, isology*

analoids A patented group of tablets containing the exact quantities of reagents used in the analysis of iron, steel, ores and slags Cf *fixanal*

analyser Analyzer

analysis (1) Assay The determination, detection, or examination of a substance (2) The breaking down or splitting of a molecule into simpler constituents (3) The reverse phenomena of synthesis **bio-** (1) The detection of substances with the aid of microorganism, *e g*, by the selective action of yeasts on sugars (2) The determination of the strength of substances, *e g*, hormones, by means of their effects on animals **biochemical-** The chemical examination of biological material **blowpipe-** The detection of metallic elements and acid radicals by means of the blowpipe **clinical-** The examination of body fluids and tissues for the diagnosis of diseases **colorimetric-** The quantitative determination of substances by means of the color intensity of their reaction products **conductometric-** See *conductometric analysis* **diffusion-** See *diffusion* **dry-** A without the use of solutions **electro-** See *electrodeposition* **analysis elementary-** The determination of the constituents of an organic compound by combustion, *e g*, C is determined as CO_2, H as H_2O **gas-** Determination of gaseous mixtures by measuring the volumes before and after treatment with a selective absorbing agent **gravimetric-** The determination of the percentage composition of a substance by weighing its constituents directly or indirectly **iodimetric-** The titration of oxidizing substances with a standardized sodium thiosulfate and acid potassium iodide solutions **mechanical-** See *mechanical* **micro-** (1) The examination of substances with the microscope for the identification of

CLASSIFICATION OF COMMON TYPES OF ANALYSIS

QUALITATIVE (*detection* of the kind of substances present)	(chemical)	Precipitation or wet method
	(thermal)	Flame tests and blowpipe analysis
	(optical)	Spectroscopic and crystal structure
	(electrical)	Electrolysis High frequency spectra
	(mechanical)	Microscope analysis Spec gravity, hydrometers
	(biochemical)	By means of microorganisms (bacteria, yeasts)
QUANTITATIVE (*determination* of the amount of substances present)	(mechanical)	Gravimetric methods (weighing the amount)
		Volumetric methods (titrating the amount)
		Gas-volumetric methods (measuring the quantity of gas)
	(thermal)	Combustion, and the absorption of the combustion gases
	(electrical)	Conductometry, potentiometry, polarography Mass-spectra
	(optical)	Colorimetry, nephelometry Fluoroscopy

certain constituents, *e g*, starch (2) The observation of characteristic reactions (precipitates, crystals) with the microscope for the detection of certain constituents (3) Micro-modifications on the small scale of the ordinary processes of quantitative analysis, for use with small quantities of materials **nephelometric-** The optical methods used to measure turbidity and thus determine the amounts of precipitates **organic-** *Elementary* analysis **proximate-** The determination of the chemical nature of the active constituents of a sample, *e g*, the carbohydrates, fats, proteins, alkaloids, glucosides, etc in drugs **qualitative-** The detection of the kind or nature of an element or compound in a substance **quantitative-** The determination of the amount or quantity of an element or compound in a substance **rational-** See rational analysis **screen-** See *screen* **spectroscopic-** See *spectroscopic* **spectrum-** The detection of elements and binary compounds by their characteristic radiations as observed through the spectroscope This method applies also to chemical analysis of celestial bodies, *e g*, stars, comets, etc **spot-** See *spot* **technical-** Practical methods used in industry for the evaluation of materials, they may be gravimetric, volumetric, conductometric, electrolytic, etc **ultimate-** Elementary a **volumetric-** The determination of elements and compounds in a substance by titration with standard solutions **wet-** An a made with solutions (*See also bead tests, calorimetry, colorimetry, electrolysis, flame tests, reactions, spectroscopy, titration*, etc , and table)

analytical Pertaining to the analysis or breaking down of a molecule **a balance** See *balance* **a chemistry** See *chemistry* **a metabolism** Catabolism **a reactions** The characteristic reactions of elements or ions, which are utilized for their identification or determination, *e g*, precipitate formation, color changes, etc **a weights** The standardized weights used on an analytical balance

analyzer (1) A device which indicates a certain condition, change or phenomenon (2) The Nicol prism of a polariscope nearest to the eyepiece (3) The first tower of a coffee still **curve-** A device for determining the slope of a graph **gas-** An apparatus for the determination of the composition of gases, *e g*, flue gases **micropolar-** An optical attachment for a microscope for the determination of polarization (q v) in crystals **polarization-** The Nicol prism in a polariscope nearest to the eye, cf *polarizer*

anamirtin (1) $C_{19}H_{26}O_{10}$ A glucoside from the fruits of *Anamirta paniculata* (2) $C_{19}H_{24}O_{10}$ A glyceride from fishberries, *Cocculus indicus* Cf *cocculin*

anamorphism The change caused by the action of pressure, water or heat on rock, *e g*, the more compact portions of the lower geologic zone of the lithosphere Cf *catamorphism*

anamorphoscope A mirror which corrects distorted images

anamorphosis The distortion of objects by mirrors

anaphase A stage of cell division which follows the division of the nucleus

anaphrodisiac A drug which diminishes sexual desire

anaphoresis The antonym of *cataphoresis*, q v

anaphylactin Allergen

anaphylatoxin A poisonous substance produced in anaphylaxis caused by the injection of proteins

anaphylaxis The increased sensitiveness of an organism to second and subsequent protein injections The opposite of immunity Cf *allergia*

anarcotine An alkaloid found in Indian opium It is not narcotic

anasthol A mixture of methyl chloride and ethyl chloride, used as a local anesthetic in dentistry

anatase TiO_2, Octahedrite A native titanium oxide

Anaxagoras 500–428 B C The first Greek scientist He distinguished physical from psychical phenomena, and assumed indivisible parts of matter

anayodin HI OH C_9H N HSO_3 Iodoxy-quinoline sulfonic acid Light yellow powder soluble in water, used as an amebicide

anchietine An alkaloid from the root of *Anchietea salutaris* (Violaceae)

anchoic acid Azelaic acid

anchored compound An organic compound which is attached to certain cells by a characteristic radical See *chemotherapy*

anchoring group (1) An organic radical which combines with cell substance and connects the compound to which it belongs with the tissue material (2) The salt-forming radical of a dyestuff

anchovy A small fish of the herring family used in the preparation of savouries **a pear** The fruit of a Jamaican tree used in the manufacture of pickles

anchusic acid An acid from the root of *Alkanna tinctoria* (Boraginaceae)

anchusin $C_{35}H_{40}O_8 = 588\ 4$ A red coloring matter from the root of *Alkanna tinctoria*, a Boraginaceae Cf *alkanet, alkannin*

andalusite Al_2SiO_5 A native aluminum silicate, found in gray or pink rhombic prisms, used for gems Cf *silica* It begins to decompose at 1410°C to give mullite

andesine $NaCaAl_3Si_5O_{16}$ A native sodium, calcium, aluminum silicate that belongs to the triclinic feldspars Cf *andose*

andesite A rock-forming mineral consisting of andesine with hornblende and mica

andirin (1) $C_{40}H_{48}O_3N = 585\ 5$ A yellow coloring matter from the bark of the cabbage tree (*Andira inermis*) (2) Rhatanin Cf *yaba* bark, *goa*

andorite $AgPbSb_3S_6$ A native, orthorhombic sulfostibide of silver and lead

andose A volcanic rock consisting of andesite with diorite

andradite An iron *garnet*, q v

Andrews, Thomas 1813–1885 An Irish chemist and physicist noted for his research on the critical temperature and pressure of gases

androkin Androsterone

andromedotoxin A poisonous principle of mountain laurel, *Kalmia latifolia*, an Ericaceae

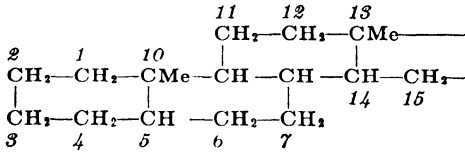
andrometoxin A poisonous principle from *Andromeda, Azalea* and *Rhododendron* species Colorless crystals, m 228, soluble in alcohol, ether, benzene or chloroform

Andropogon A genus of grasses, some of which yield essential oils used in perfumery, *e g*,

A (or *Cymbopogon*) *citratus*	lemongrass oil
A (or *Cymbopogon*) *nardus*	citronella oil

A (or *Cymbopogon*) *odoratus*	gingergrass oil
A (*Cymbopogon*) *martini*	palmarosa oil
Cymbopogon caesius	inchigrass oil
Cymbopogon nervatus	naal oil
A sorghum	sorghum

androstane $C_{19}H_{32}$ = 260 0 A solid hydrocarbon and parent substance of sex-hormones, bile acids, sterols, etc See *cholane* derivatives **a ring** The saturated four-ring complex



It occurs in many important biochemical compounds See *cholane* derivatives

androsterone $C_{19}H_{30}O_2$ = 290 13 Androtin, androkin, *3-cis*-hydroxy-*17*-ketoandrostane The male sex hormone, from urine, testes, plants or synthetically prepared Colorless crystals, m 178, soluble in benzene Cf *theelin*, *cholane* ring **dehydro-** $C_{19}H_{28}O_2$ = 288 13 A male hormone from urine, or synthetically prepared Colorless crystals m 148 soluble in water

androtin Androsterone

-ane (1) A suffix which indicates a saturated hydrocarbon of the methane series (2) A desoxy compound, as, quinane, cholesterane

anemium Actinium

anemometer An apparatus for measuring wind-velocity or pressure Cf *pitot* tube

anemone camphor A principle from pulsatilla (*Anemone pulsatilla*), which splits into anemonin and anemonic acid

anemonic acid $C_{10}H_{10}O_5$ = 210 1 Yellowish crystals obtained from anemone camphor, insoluble in water and decomposed by alkalis to anemoninic acid

anemonin $C_{10}H_8O_4$ = 192 1 Pulsatilla camphor Yellowish crystals m 152 (decomp), insoluble in water but soluble in hot alcohol Used as an antispasmodic, sedative and anodyne **hydro-** $C_{10}H_{12}O_4$ = 196 1 Large, colorless, scales m 78 b_{10mm} 210

anemoninic acid $C_{10}H_{12}O_6$ = 228 1 Colorless crystals derived from anemonic acid, m 189, soluble in water

anemosite A mixed feldspar consisting of sodium anorthite associated with albite

aneroid See *barometer* **a battery** Dry cell

aneson *Acetone* chloroform

anesthesia The loss of sensation **local-** The loss of feeling at a definite part of the body

anesthesin Benzocaine

anesthesiophore radical The benzoyl group, $PhCO^-$, which produces anesthetic effects

anesthetic, anæsthetic A drug which causes the loss of sensation **general-** A which affect consciousness, hence deaden the sensations of the whole organism, such as, ether, chloroform, nitrous oxide, etc **local-** A which affect only a particular part of the body, *e g* , cocaine, ethyl chloride, novocaine, stovaine, quinine and urea hydrochloride **a gas** Nitrous oxide

anesthetizing valve A device for mixing an anesthetic with air for respiration in animal experiments

anethol $C_{10}H_{12}O$ = 148 15 Anethole, p-allyl-phenylmethyl ether, anise camphor, p-methoxy-propenyl benzene, methylallyl phenol, 1-methoxy-4-allyl-benzene, p-allyl-phenylic-methylic ester, *p*-propenylanisole, MeO C_6H_4 CH CHMe A constituent of anise and fennel oils Colorless leaflets or an aromatic liquid with fragrant odor, d 0 994, m 21 6, b 223, very slightly soluble in water, and soluble in alcohol or ether Used as a reagent for the detection of lignin, as a flavoring agent in perfumery, medicinally as a carminative and antiseptic and also in microscopy and for the preparation of anisaldehyde

anethoquinine Quinine anisate

anethum Garden dill, dill seeds The fruits of *Paucedanum* (*Anethum*) *graveolens*, an Umbelliferae, used medicinally as carminative, and as a spice or condiment

aneurin(e) Vitamin B_1

angelic acid $C_5H_8O_2$ = 100 08 Angelicic acid, *α*-methylisocrotonic acid, *cis-2*-methyl-*2*-butenoic acid*, MeCH CMeCOOH Colorless monoclinic crystals of spicy odor, $d_{76°}$ 0 954, m 45 5, b 185, sparingly soluble in water, but soluble in alcohol or ether It is a constituent of *Angelica*, *Chamomile*, and *Arnica* species, and is used as a flavoring agent Its isomer is *tiglic* acid (q v) **cinnamenyl-** See *cinnamenyl* **hydro-** *α*-Methylbutyric acid **iso-** Tiglic acid

angelica The dried herb of *A* or *Archongelica officinalis*, an Umbelliferae **a lactone** $C_7H_6O_2$ = 98 1 *alpha-* Colorless crystals, m 18, or a colorless liquid, b 167 *beta-* A colorless liquid, m −10 b 83, used in flavoring extracts **a root** The rhizomes and roots of *Angelica* species, used medicinally as a fluid extract, as a diuretic, diaphoretic and stimulant **a root oil** A colorless, essential oil which is sometimes pale yellow, d 0 855–0 918, $[\alpha]_D$ + 16° to +32°, b 60–70, refractive index (20°C) 1 4800 Its chief constituents are phellandrene and valeric acid, soluble in alcohol, ether, benzene or chloroform Used for flavoring *Japanese-* Colorless crystals, d 0 915 m 62, b 300, soluble in alcohol, ether, chloroform or benzene, and used for flavoring **a seeds** The ripe, dried fruits of *Angelica* species, used medicinally as a carminative stimulant or aromatic as a fluid extract or oil **a seed oil** An essential oil from angelica seeds A pale-yellow liquid which darkens with age, d 0 856–0 890, $[\alpha]_D$ + 11° to +12°, miscible with alcohol, ether, benzene, or chloroform Its chief constituents are phellandrene and valeric acid, used for flavoring **a tree** The shrub or tree, *Xanthoxylum americanum*, a Rutaceae found in the United States The crushed bark smells like angelica and is used as a purgative and emetic

angelicic acid Angelic acid

angelicin $C_{18}H_{30}O$ = 262 3 A constituent of the roots of *Angelica officinalis* Colorless crystals, m 126 5, insoluble in water but soluble in alcohol or ether

angelin Rhatanin

Angelus still A distillation apparatus that can be fixed to a wall

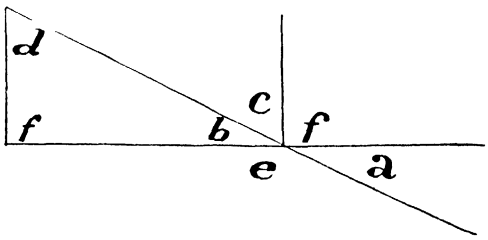
angico gum Brazilian gum, Para gum A mucilaginous secretion of *Piptadenia rigida*, a Leguminosae of Brazil, used similarly to gum arabic Cf *cebil* gum

angiology The science of blood and lymph vessels

angioneurosin *Nitro*-glycerin

angiosperm A flowering plant which has seeds enclosed in a fruit, *e g* , the pea-pod Cf *gymnosperm*

angle The difference in direction of any two lines, the figure formed by two converging lines when they meet, the vertex of the two lines **acute-** An a less than 90°, (a) **adjacent-** An a which has one line common with another angle, (b) **complementary-** The complement of an a (c) is 90° less the a —*i e*, (b) **critical-** See *critical* **meter-** See *meter* **oblique-** An a opposite to a right a, (d) **obtuse-** An a greater



than 90°, (e) **right-** An a of 90° (f) **supplementary-** The supplement of an a (a) is 180° less the a —*i e*, (e) **a thermometer** An L-shaped thermometer

anglesite A native lead sulfate, $PbSO_4$, which crystallizes in variously colored orthohombic crystals Cf sardinianite

anglo-helvetium Alabamine The name proposed by Leigh-Smith and Minder for element No 85 discovered by them in 1940, and isolated in 1943 from monazite sand

angora A breed of goats with long, silky, curly coats of valuable wool

angostura A South American tree, *Galipea cusparia* (*Cusparia febrifuga*) A Rutaceae **a alkaloids** The alkaloids of a, as, angosturine cusparine, cusparidine, galipein, galipidine, etc **a bark** Cusparia bark, carony bark The bark of angostura, used as a bitter tonic and stimulant **a oil** An essential oil from the bark of angostura A yellow liquid of aromatic odor, d 0 930–0 960, $[\alpha]_D = -36°$ to $-50°$ soluble in alcohol, ether chloroform, or benzene Its constituents are galipene, galipol, cadinene and pinene, used in flavoring extracts

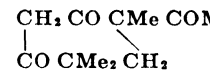
angosturine $C_{10}H_{40}O_{14}N$ = 398 4 An alkaloid from angostura bark Colorless crystals, m 85 used as a tonic

Angström, A J 1814–1874 A Swedish physicist, noted for optical research

ångstrom å, Å or A U A unit of wave length 1å = 10^{-7} mm = 10^{-10} m = 0 000,000,0001 meter = 1 am (atom meter) Also 10a = 1$\mu\mu$ = 10^{-6} mm *International* Å I Å The wave length of the red line of cadmium which = 6438 - 4696 I Å in air at 15°C Thence the I A = 10^{-10} m Cf λ (*lambda*)

angular Pointed, having sharp cornered angles **a acceleration** Angular acceleration, a, = $(v_t - v_0)/t$ where v_t is the velocity after time t, and v_0, the initial velocity The unit is one radian per second per second **a aperture** The largest angle subtended by a wave surface transmitted by an objective **a momentum** Spin The product of the a velocity and moment of inertia of a body, hence, the mass of angular motion expressed in grams per cm - second **a motion** The motion of a line, fixed at one end in one plane, relative to a straight line through the center of rotation, as the hand of a clock **a velocity** The ratio of the angle described in a given time to that time $v = \theta/t$, where θ is the angle traversed in the time, t The unit is one radian per second

angustione $C_{11}H_{16}O_3$ = 196 11 A cyclohexane triketone isolated from the oil of *Backhousia*

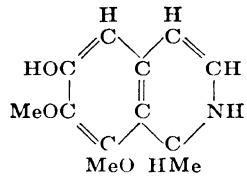


angustifolia, a Myrtaceae A colorless liquid, d 1 089, b_{15mm} 129, $[\alpha]_D$ − 5 56°

anhalamine $C_9H_7(OCH_3)_2OH$ NH = 209 1 An alkaloid from *mescal* buttons (q v)

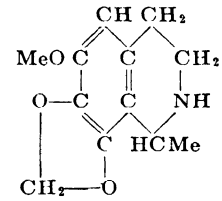
anhaline $C_{10}H_{17}ON$ = 167 15 An alkaloid from *Anhalonium fissuratum* It crystallizes in large crystals from sulfuric acid solution

anhalonidine $C_{12}H_{15}O_3N$ = 221 19 *1 2*-Dihydro-*6*-hydroxy-*7 8*-methoxy-*1*-methyl quinoline An alkaloid from mescal buttons Colorless octahedric crystals, m -154, optically inactive,



soluble in water, alcohol or ether

anhalonine $C_{12}H_{15}O_3N$ = 221 19 *1 2 3 4*-Tetrahydro-*6*-methoxy-*1*-methyl-*7 8*-methylenedioxyquinoline An alkaloid from *Anhalonium* species (Cactaceae) Colorless needles, m 254, extremely poisonous, optically inactive, soluble



in water, alcohol or ether **methoxy-** Iopophorine

a hydrochloride $C_{19}H_{15}O_3N$ HCl = 257 7 Colorless crystals, soluble in water, and sparingly soluble in alcohol, used as a heart tonic

Anhalonium A Mexican cactus species, *A lewinii* (peyotl), used for narcotic and intoxicating drinks by the natives The cactus contains a number of alkaloids Cf *mescal* buttons **a alkaloids** See *anhalamine*, *anhalonine*, *lophophorine*, *mexaline*, *pellotine*, etc

anhidrotic Antihidrotic A drug which lessens perspiration

anhydride A compound (usually an acid) from which water has been removed, as, $H_2XO_3 - H_2O = XO_2$ **acid-** The oxides of nonmetals, which form acids with water **basic-** The oxides of metals, which yield bases with water **inner-** A ring compound formed by the abstraction of water, as, lactones, phthalic anhydride, etc (See also *acetic-*, *chromic-*, *osmic-*, etc)

anhydrite $CaSO_4$ A native anhydrous calcium sulfate occurring in white or gray orthorhombic masses Cf *muriacite*, *tripestone*, *vulpinite*

anhydro- A prefix to compounds from which one or more molecules of hydrogen have been extracted They are, therefore, less saturated Cf *anhydrous*.

anhydroecgonine $C_9H_{13}O_2N$ = 167 55 Ecgonidine Colorless crystals, m 235, soluble in water, alcohol or ether **a hydrochloride** $C_9H_{13}O_2N$ HCl = 203 63 It is derived from ecgonine Colorless rhombic needles, m 241 $[\alpha]_D$ − 61 5°, soluble in water or alcohol

anhydroformaldehyde aniline PhN CH_2 = 105 01 A solid, m 120, insoluble in water and soluble in alcohol or ether

anhydroglycochloral Chloralose

anhydrone Trade name for anhydrous, magnesium perchlorate prepared by igniting the trihydrate It is a powerful desiccant

anhydrosynthesis The theoretical coupling of a functioning *group* q v , with another compound, with the subsequent elimination of water Cf *derivative*

anhydrotrimbome Trimbonine

anhydrous A compound which has lost all its water, in particular water of crystallization Cf *anhydro-*

anilides (1) A group of compounds containing the monovalent C_6H_5NH—radical derived from aniline, *e g* ,

benzanilide	Ph NH CO Ph
acetanilide	Ph NH CO Me
diacetanilide	PhN(OCMe)$_2$
cyananilide	PhNCN

(2) Sometimes applied to compounds containing the $NH_2C_6H_4$— group (anilinate), as, arsenic acid anilide (= arsanilic acid) **acet-** Acetanilide **form-** C_6H_5NH CHO Colorless crystals, m 46, b 284 **methylacet-** Exalgin

anilidothiobiazole 1 2 3-Thiodiazole

anilinate A compound of aniline and a metal, $NH_2C_6H_4M$, as, mercury anilinate Cf *anilide*

aniline $C_6H_5NH_2$ = 93 10 Phenylamine, aminobenzene, phenylid, cyanol, aniline oil, benzidam, $PhNH_2$ A colorless or slightly brown liquid, darkening with age, $d_{20°}$ 1 022, m −6, b 184 4, soluble in 35 pts water, and miscible with alcohol or ether Used as a reagent, for aldehydes, chloroform, fusel oil, phenols, etc , in bacteriology, for preparing staining solutions, in medicine, as an antiseptic, and extensively in the dye and rubber industries for organic synthesis and in the manufacture of resins, varnishes, and bakelite Cf *anilide, anilinate, nitrobenzene* reduction **acetyl-** Acetanilide **allyl-** See *allyl* **amino-** Phenylenediamine **aminodimethyl-** Dimethylphenylenediamine **benzal-** Benzalaniline **benzilidene-** See *benzalaniline* **benzoyl-** Benzanilide **benzyl-** See *benzyl* **bi-** Benzidine **bromo-** $NH_2C_6H_4Br$ = 172 0 Aminobromo benzene, bromophenylamine **o-** Colorless crystals, m 31, b 150, soluble in alcohol **m-** Colorless crystals $d_{21°}$1 582 m 18, b 251, soluble in alcohol **p-** Colorless rhombic crystals, m 66 (decomp), insoluble in water, soluble in alcohol or ether **chloro-** $NH_2C_6H_4Cl$ = 127 57 Aminochlorobenzene chlorophenylamine **o-** A colorless liquid, $d_{20°}$1 213, b 207, soluble in water or ether **m-** A colorless liquid, $d_{20°}$1 216, b 230 **p-** Rhombic crystals, $d_{18°}$1 340, m 70, b 230, soluble in hot water, alcohol or ether **cyano-** Cyananilide **diacetyl-** Diacetanilide **dibenzyl-** See *benzyl* **dichloro-** $NH_2C_6H_3Cl_2$ = 162 01 Aminodichlorobenzene, dichlorophenylamine 2 4-Colorless needles, m 63, b 245 soluble in alcohol 3 4- Colorless needles, m 71 5, b 272, soluble in alcohol 3 5- Colorless needles m 50 5 b 260, soluble in alcohol **diethyl-** $C_6H_5N(C_2H_5)_2$ = 149 21 A yellow liquid, d 0 936, m 38, b 213 5, sparingly soluble in water, soluble in alcohol or ether **dimethyl-** $C_6H_5N(CH_3)_2$ = 121 17 A yellow liquid, $d_{20°}$0 958, m 2 5, b 194, slightly soluble in water, but miscible with alcohol or ether **dimethyl-** *ar-* Xylidine *N-* See *dimethyl* **dimethylamino-** Dimethylphenylenediamine **dinitro-** Dinitraniline **diphenyl-** Triphenylamine **ethoxy-** Phenetidine **ethyl-** $C_6H_5NH(C_2H_5)$ = 121 17 A colorless liquid, $d_{20°}$ 0 963, m −80 b 205, sparingly soluble in water and miscible with alcohol or ether **formyl-** Formanilide **hexahydro-** Cyclohexylamine **hydroxy-** *ar-* Aminophenol *N-* Phenylhydroxylamine **iodo-** $NH_2C_6H_4I$ = 219 01 Aminoiodobenzene, iodophenylamine **o-** Colorless needles, m 60, sparingly soluble in water, soluble in alcohol **m-** Colorless leaflets, m 26, insoluble in water, soluble in alcohol **p-** Colorless prisms or needles, m 63, insoluble in water, soluble in alcohol **isopropyl-** Cumidine **methenyltri-** Leucaniline **methoxy-** Anisidine **N-methyl-** $C_6H_5NHCH_3$ = 107 12 A yellow liquid, $d_{29°}$ 0 987, m 195 5, slightly soluble in water, miscible with alcohol or ether **ar-methyl-** Toluidine **nitro-** $NH_2C_6H_4NO_2$ = 138 06 Aminonitrobenzene, nitrophenylamine **o-** or **1 2-** Yellow rhombic needles, d 1 442, m 71 5, b 284 **m-** or **1 3-** Yellow needles, d 1 430, m 111 8, b 286, **p-** or **1 4-** Yellow monoclinic needles, d 1 424, m 147 b 331 7 **N-** Phenylnitramine, nitranilide, diazobenzolic acid, Ph-NH NO_2 or Ph N NOOH Pale yellow crystals, m 46, exploding at 98, soluble in water **nitroso-** $NH_2C_6H_4NO$ = 122 10 **p-** Steel-blue needles, m 173, soluble in alcohol or benzene **p-nitrosodiethyl-** $(C_2H_5)_2N\,C_6H_4NO$ = 178 18 Colorless needles, m 84 slightly soluble in water, soluble in alcohol **p-nitrosodimethyl-** $(CH_3)_2N\,C_6H_4NO$ = 150 14 Green scales, m 87 8, slightly soluble in water soluble in alcohol or ether **pentachlor-** $NH_2C_6Cl_5$ = 265 36 Colorless needles, m 232, soluble in alcohol or ether **phenyl-** *N-* Diphenylamine *ar-* Biphenylamine *p-* Xenylamine **propionyl-** Propioanilide **thio-** Thioaniline **thionyl-** Thionylaniline **tribromo-** Tribromoaniline **trimethyl-** See *mesidine, pseudocumidine* **trinitro-** Picramide

a acetate $C_6H_5NH_2\,CH_3COOH$ = 153 1 A colorless liquid which readily freezes, soluble in water or alcohol It is a reagent for furfural **a azo-β-naphthol** *Sudan* yellow **a black** Nigrosine **a blue** A mixture of the salts of triphenylrosaniline sulfonic acids A blue powder, soluble in water and used as a dye for cotton and silk **a brown** Triaminoazobenzene **a camphorate** $(C_6H_5NH_2)_2\,C_{10}H_{16}O_4$ = 386 3 Yellow crystals sparingly soluble in water or glycerin, used as an antispasmodic **a. chloride** a hydrochloride **a colors** a dyes **a dyes** (1) Artificial or synthetic coloring matters (2) Those derived from benzene or aniline **a fluoride** a hydrofluoride **a hydrobromide** $C_6H_5NH_2$ HBr = 174 Gray or yellow crystals, soluble in water or alcohol **a hydrochloride** $C_6H_5NH_2$ HCl = 129 6 Aniline salt, aniline chloride Colorless crystals, d 1 2215, m 198, b 241, soluble in water or alcohol Used as reagent for chlorates, and in organic synthesis mainly for preparation of dyestuffs **a hydrofluoride** $C_6H_5NH_2$ HF =

113 1 Colorless crystals, soluble in water **a' hydroiodide** $C_6H_5NH_2$ HI = 221 07 Yellow crystals, soluble in water **a hydrosilicofluoride** $(C_6H_5NH_2)_2$ H_2SiF_6 = 330 1 Colorless crystalline powder, soluble in water or alcohol, used as a reagent **a nitrate** $C_6H_5NH_2$ - HNO_3 = 156 1 Colorless or slightly yellow crystals, decomp at 190, soluble in water or alcohol **a oil** Crude aniline **a orange** *Victoria* orange **a oxalate** $(C_6H_5NH_2)_2$ - $C_2H_2O_4$ = 276 1 Colorless crystals, soluble in water **a point** The critical solution temperature of a mixture of a and a water-insoluble liquid It is used for the determination of petroleum in mixtures by comparing their a points with those of mixtures of known compositions **a purple** Mauvein The first aniline dye, discovered in 1856 by W H Perkin **a red** Fuchsin **a salt** a hydrochloride **a sulfate** $(C_6H_5NH_2)_2$ H_2SO_4 = 294 1 White crystals, soluble in water or alcohol, used as a stimulant in epilepsy and chorea **a sulfonic acid** **o-** Orthanilic acid **m-** Metanilic acid p- Sulfanilic acid **a tribromide** Tribromoaniline **a yellow** (1) Spirit yellow, amidoazobenzene hydrochloride Steel-blue needles soluble in water and used for coloring lacquers (2) The dye uranine yellow II

anilino The monovalent radical PhNH— or C_6H_5NH—, derived from aniline

anilipyrine A compound of acetanilide and antipyrine Colorless crystals, m 75, soluble in water, used as an antipyretic and antineuralgic

anilism A form of poisoning produced by aniline vapors The term now also includes cyanotic T N T poisoning

aniluvitonic acid $C_{11}H_9O_2N$ = 187 08 Methylcinchoninic acid Colorless crystals, m 241

animal A living organism, capable of locomotion and requiring organic food Animal metabolism is analytic, destructive or energy-releasing, whilst that of plants is synthetic, constructive or energy-binding **a alkaloids** A group of basic, organic compounds which are formed by the decomposition of animal matter, see *leucomaine, ptomaine* **a charcoal** See *charcoal* **a dyes** A coloring matter derived from the animal world, as cochineal, **kermes**, Indian yellow, and sepia **a fibres** A textile fiber derived from animals, as silk or wool **a holder** A block of metal or wood with a cylindrical iron screen for holding small animals during injection **a oil** (1) A fat or oil of animal origin (2) Bone oil **a poisons** A toxic substance of animal origin, as the animal alkaloids or the toxins from bees, wasps, hornets, toads, or snakes **a products** A group of drugs or substances derived from animal species, *e g* , **a secretions** Animal products **a starch** Glycogen **a tissues** See *animal* products

Secretions

Animal	*Drug*
Astacus flavatus	crab stones
Acipenser (sturgeon)	isinglass
Physeter (whale)	ambergris, spermaceti
Gadus morrhua (codfish)	cod liver oil
Apis (bee)	honey, bees' wax
Moschus (musk deer)	musk
Bos taurus (ox)	ox gall
Bos taurus (cow)	cows' milk, milk sugar
Ovis aries (sheep)	mutton suet, adrenal extract, lanolin
Sus scrofa (hog)	lard, pepsin, pancreatin
Castor fiber (beaver)	castoreum
Viverra zibetha	civet

Structural tissues

Spongia officinalis	sponge
Oculina virginea	coral
Ostrea species	oyster shell
Sepia officinalis	cuttlefish bone

animalcule A protozoon or microscopically small animal occurring in ponds or stagnant water Cf *ameba, paramecia*

anime *Animi* resin

animi resin A fossil copal from Zanzibar, Madagascar and the East Coast of Africa, used for varnishes and lacquers

animikite A native silver antimonide, Ag_9Sb, occurring in the Lake Superior region

aninsulin An antigenic, non-hypoglycemic substance made by heating insulin with formaldehyde

anion The negatively charged atom or radical liberated at the anode during electrolysis, as, Cl^-, NO_3^-, SO_4^{--} Cf *cation*

anionotropy A case of *ionotropy*, q v , in which a OH^- or X^- group breaks off from a molecule and leaves a positive ion in a state of dynamic equilibrium Cf *prototropy*

anisacetone $C_{10}H_{12}O_6$ = 164 09 *p*-Methoxyphenylacetone, MeO $C_6H_4CH_2COMe$ A constituent of anise oil

anisal Anisylidene The divalent radical MeO - C_6H_4 CH=, derived from anisaldehyde

anisalcohol $C_9H_{10}O_2$ = 138 1 Anisyl-alcohol, p-methoxy-benzalcohol, MeO C_6H_4 CH_2OH Colorless needles d 1 113, m 45, b 259, insoluble in water, but soluble in alcohol or ether

anisaldehyde $C_8H_8O_2$ = 136 1 Anisyl aldehyde, p-methoxy-benzaldehyde, para-anisic aldehyde, aubepine, MeO C_6H_4 CHO A colorless liquid, d 1 126, m −2, b 245, sparingly soluble in water, but miscible with alcohol or ether It occurs in Tahiti vanilla and is used in perfumery **3-hydroxy-** Isovanillin **ortho-** o-Methoxybenzaldehyde

anisaldoxime $C_8H_9O_2N$ = 151 1 p-Methoxybenzaldoxime, MeO C_6H_4 CH NOH *α*- Colorless crystals, m 64 *β*- Colorless crystals, m 133

anisate Any salt of anisic acid, or a compound of the type MeO C_6H_4 COOM

anise Aniseed, anise fruit The dried ripe fruit of *Pimpinella anisum*, an Umbelliferae It is used as a condiment, and medicinally as an expectorant and aromatic carminative **star-** The seeds of *Illicium verum*, a magnoliaceous tree, the source of anise oil **a bark oil** An essential oil from the bark of a Madagascar tree A light-yellow oil of spicy taste, d 0 969, soluble in alcohol, ether, chloroform or benzene Its chief constituent is methyl-chavicol **a camphor** Anethol **a fruit** Anise **a oil** The essential oil from the seeds of *Pimpinella anisum*, an Umbelliferae A pale-yellow liquid or colorless crystalline masses of characteristic odor and aromatic, sweet taste, d 0 978–988, m 15, b 210, soluble in alcohol Used as a flavoring agent, and medicinally as an aromatic carminative Its constituents are anethol and methyl-chavicol *star-* Illicium oil An essential oil from the

seeds of *Illicium verum*, an evergreen magnolaceous tree A colorless liquid, d 0 980–0 990, m 14–18, soluble in alcohol It is used as a flavoring similar to a oil, and contains anethol and methyl chavicol **a seed oil** Anise oil **a water** Aqua anisi A saturated solution of a oil in distilled water

anisic acid $C_8H_8O_3$ = 152 1 p-Methoxy-benzoic acid, umbellic acid, draconic acid, methyl-p-oxybenzoic acid, MeO C_6H_4 COOH Colorless monoclinic crystals d 1 364, m 184, b 275, slightly soluble in water, soluble in alcohol or ether, used as an antiseptic and antipyretic **4-hydroxy-** Vanillic acid **hydroxymethyl-** Everninic acid **3-methoxy-** Veratric acid **a alcohol** Anisalcohol **a aldehyde** Anisaldehyde

anisidine C_7H_9ON = 123 1 Methoxy-aniline aminophenolmethyl ether, $NH_2C_6H_4OMe$, methoxy-aminobenzene, methyloxyaniline **o- ortho-** A brown oily liquid, d 1 098, m 6, b 224, slightly soluble in water **m- meta-** A volatile liquid b 251 **p- para-** Colorless needles d 1 071, m 58, b 245, soluble in alcohol **acet-** Methacetin **di-** Dianisidine

anisil $C_{16}H_{14}O_4$ = 270 1 Bianisaldehyde, p p'-dimethoxybenzil, dianisoyl, MeOC_6H_4CO COC_6-H_4OMe Colorless crystals, m 133

anisoin $C_{16}H_{16}O_4$ = 272 1 Dimethoxybenzoin The compound MeOC_6H_4CO CHOH C_6H_4OMe

anisole C_7H_8O = 108 1 Methoxybenzene*, methylphenyl ether methylphenate, MeOPh A colorless liquid, d 0 988, m −38, b 155, insoluble in water, soluble in alcohol or ether It is used in perfumery and to kill lice **aceta-mido-** Acetaniside *p*-**allyl-** Estragole **amino-** Anisidine **azoxy-** Azoxyanisole **bromo-** Br-C_6H_4OMe = 186 97 Bromomethoxybenzene*, bromophenylmethyl ether **o-** or **1 2-** An oily liquid, d 1 573, b 222 **p-** or **1 4-** Colorless crystals, d 1 494, m 11, b 215 **dinitro-** $(NO_2)_2$-C_6H_4OMe = 198 06 Dinitromethoxybenzene, *2 4*-dinitrophenylmethyl ether Yellow leaflets, m 89 **hydroxy-** Guaiacol **iodo-** Iodanisole **methoxy-** Veratrole **nitro-** Nitroanisole **propenyl-** Anethole **trinitro-** $C_7H_5N_3O_7$ = 243 06 Methyl picrate, methoxypicric acid, $(NO_2)_3$-C_6H_4OMe Yellow crystals, d 1 408, m 68 4, insoluble in water, used as explosive **vinyl-** $C_9H_{10}O$ = 134 08 Methoxystyrene, CH_2 CH - C_6H_4 OMe **o-** or **1 2-** Colorless liquid, d 1 0095, b 195 **m-** or **1 3-** An oily liquid b 90 **p-** or **1 4-** Colorless liquid, b 204, insoluble in water

anisomeric Not isomeric

anisonitrile C_8H_7ON = 133 06 Methoxybenzonitrile MeO C_6H_4 CN **1 4-** or **p-** Colorless crystals, m 60, b 256

anisotonic Not isotonic

anisotropic (1) Having different physical properties in different directions, as crystals (2) A doubly-refractive substance is anisotropic When viewed through a Nicol prism it shows prominent crosses, indicating that it has more than one index of refraction and therefore, is not optically homogeneous Antonym isotropic **a liquid** *Liquid* crystal

anisoyl The monovalent radical MeO C_6H_4-CO—, derived from anisic acid **di-** Anisil **a chloride** $C_8H_7O_2Cl$ = 170 6 Anisyl chloride, *p*-methoxybenzoyl chloride The compound MeO C_6H_4 COCl Small colorless needles, m 26, insoluble in water or alcohol, and soluble in ether

anisum Anise

anisyl The monovalent radical MeO C_6H_4—, derived from methoxybenzene or anethole There are three isomeric forms, as, ortho- (-guaiacyl), meta-, and para- **a alcohol** Anisalcohol **a amine** Anisidine **a chloride** Anisoyl chloride

anisylidene Anisal

anitin Anytin

anitol Anytol

ankerite A native carbonate of calcium, magnesium iron, and manganese (CaMgFeMn)CO_3

annabergite Nickel-bloom, nickel ocher A native nickelous arsenate, $Ni_3As_2O_2$ 8H O, which occurs in green, monoclinic crystals in Nevada

annatto Annotto, annotta, arnotta, orleana, roucou The orange coloring matter from the pulp of the seeds in the fruits of the evergreen *Bixa orellana*, a Bixaceæ The active principle is supposed to be bixin It is used for coloring cheese, cream and milk, and as a dyestuff for silk, wool and cotton It is often adulterated with flour chalk, soap, etc

anneal To temper by heating

annealing The tempering of glass or metals by heating then cooling, thus rendering them less brittle See *tempering* **a color** The tints of steel during annealing **a cup** A small crucible of fine clay, used for silica fusions

annerodite A native uranium and yttrium columbate occurring in black orthorhombic crystals

annidalin *Thymol* iodide

annotto Annatto

annular A ring-shaped enclosed space

anode (1) Posode The positive pole or electrode of a battery, vacuum tube, or electrolysing circuit Usually made of carbon or platinum, according to the purpose for which it is to be used **carbon-** A rod-shaped electrode for batteries or electrolytic cells **platinum-** (1) A spiral shaped electrode for electrolysis (2) A platinum wire fused in the glass of a vacuum tube

anodic Pertaining to the anode **a oxidation** The protecting of metals, as aluminum, against corrosion by producing a thin film of oxide on the surface by making them the anode in a chromic acid bath

anodyne A drug which relieves pain, as, opium, belladonna or bromides

anodynin Antipyrine

anodynon Ethyl chloride

anogen Mercurous iodobenzene-p-sulfonate

anol $C_9H_{10}O$ = 134 08 Propenyl phenol(para), MeCH CH C_6H_4 OH A crystalline solid, m 98, b 250 (decomp), a constituent of essential oils

anolyte The liquid in the immediate neighborhood of the anode during electrolysis Cf *catholyte*

anomaly An abnormal or irregular type or form

anomite A variety of the mineral, biotite, containing lithium

anonaceine An alkaloid from *Hylopeia aethiopica* an Anonaceae

anorganic Inorganic

anorthic Triclinic

anorthite $CaAl_2Si_2O_8$ A white, grayish or reddish triclinic feldspar **sodium-** a containing albite Cf *silica, anemonsite*

anorthoclase A triclinic sodium-potassium feldspar

anorthosite An igneous gabbro rock composed mainly of feldspar

anoxemia A pathological condition characterized by the lack of oxygen in the blood, as mountain sickness, balloon sickness

anoxyscope A glass apparatus for demonstrating the necessity for oxygen for plant growth

Anschütz thermometers A German make of standard thermometers

anserine $C_{10}H_{16}O_3N_4$ = 240 14 N-β-alanyl-1-methylhistidine A dipeptide found in the muscles of birds, reptiles and fishes, m *238*, a homolog of carnosine

ant oil Furfural

antacid A drug which neutralizes acids or relieves acidity, *e g* , lime water, milk of magnesia, carbonates

antacidin Calcium saccharate

antagonism Counter-action or opposition **biological-** The inhibition of the toxic effect of certain substances by the action of other substances, *e g* certain ions

antagonist Physiological *antidote*

antagonistic A drug which counteracts the physiological effect of another drug

antalkaline A drug which neutralizes alkalis or relieves alkalinity, *e g* , acetic acid, weak hydrochloric acid

anthranthrene $C_{21}H_{16}$ = 328 11 A group of hexacyclic hydrocarbons consisting of two fused anthracene rings

anthelmintic Helminthic A drug which causes the expulsion of intestinal worms Cf *vermicide*

anthemane $C_{18}H_{38}$ = 254 4 Octodecane, a paraffin found in chamomile flowers

anthemene $C_{18}H_{36}$ = 252 4 Octadecylene A hydrocarbon, d 0 791, m 18, b 179, from *anthemis*, q v

anthemidine An alkaloid from mayweed (*Anthemis cotula*), used as an antispasmodic

anthemis Roman chamomile or ground apple The flower heads of *Anthemis nobilis*, (Compositae) Used medicinally in the form of a fluid extract as a tonic and antispasmodic

anthemol $C_{10}H_{16}O$ = 152 1 Chamomile camphor A constituent of anthemis

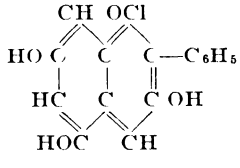
anther The pollen-bearing part of a flower

antheraxanthin $C_{20}H_{28}O_3$(?) A carotenoid (q v), m 211, from the anthers of *Lilium tigrinum*, a Liliaceae

anthion Potassium persulfate

antho- a prefix derived from the Greek "flower", it indicates a relationship to flowers

anthocyanidins Vegetable principles occurring in the red, blue and purple coloring matter of flowers They are derivatives of 3, 5 7-trihydroxyflavylium chloride



by the substitution of hydroxyl groups in the phenyl radical, thus

$—C_6H_4OH$	Pelargonidin chloride
$—C_6H_3(OH)_2$	Cyanidin chloride
$—C_6H_2(OH)_3$	Delphinidin chloride

Cf *flavones*

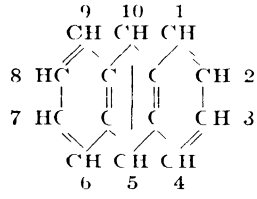
anthocyanins Glucosides comprising the soluble coloring matter of blue, red and violet flowers, as, cyanin, delphinin, pelargonin, rutin Cf *flavylium*

anthocyans A group of red, blue and violet coloring materials of plants

anthophyllite $MgFe(SiO_3)$ A brownish-gray, orthorhombic amphibole

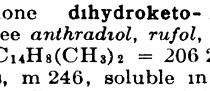
anthoxanthins A group of glucosides comprising the coloring matter of yellow flowers as quercetin, lotusin, luteolin, they yield either flavone or xanthone derivatives on hydrolysis

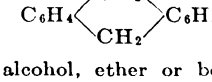
anthracene $C_{14}H_{10}$ = 178 15 Anthracin p-naphthalene anthracene oil A hydrocarbon



Another numbering is
5- is *10-* or γ or *ms-*
6- is *9-* or *α*
7- is *8-* or *β*
8- is *7-* or *β*
9- is *6-* or *α*
10- is *5-* or γ or *ms-*

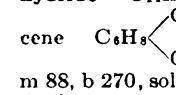
from coal tar distillation Colorless, blue fluorescent needles, d 1 147, m 216 5, b 351, insoluble in water, soluble in benzene, alcohol or ether Used in the manufacture of alizarin dyes Anthracene oil of commercial grade contains also carbazole and phenanthrene **amino-** Anthramine **diamino-** Anthradiamine **dibromo*-** $C_6H_4C_2Br_2C_6H_4$ = 335 97 *9 10-* or *ms-* Yellow crystals, m 221, insoluble in water, sparingly soluble in alcohol or ether, soluble in chloroform **dichloro*-** $C_6H_4C_2Cl_2C_6H_4$ = 247 05 *9 10-* or *ms-* Yellow needles, m 209, insoluble in water, soluble in benzene, sparingly soluble in alcohol or ether **dihydro*-** C_6H_4-$(CH_2)_2C_6H_4$ = 180 17 Hydroanthracene, diphenylene dimethylene Colorless triclinic crystals, m 108 5, b 313, insoluble in water and soluble in alcohol or ether **dihydrodiketo-** Anthraquinone **dihydroketo-** Anthranone **dihydroxy-** See *anthradiol, rufol, flavol, chrysazol* **dimethyl-** $C_{14}H_8(CH_3)_2$ = 206 20 **2 3-** Colorless leaflets, m 246, soluble in benzene **2 4-** Colorless needles, m 71, soluble in ether or benzene **ethyl*-** $C_{16}H_{14}$ = 206 11 *9-* or *ms-* Colorless leaflets, d 1 041, m 59, insoluble in water **hexahydro-** $C_{14}H_{16}$ = 184 20 Colorless leaflets, m 63, b 290, insoluble in water,





soluble in alcohol, ether or benzene **hydro-** Dihydro- **hydroxy-** See *anthranol, anthrol* **ketohydroxy-** Oxanthrol **methyl-** $C_{14}H_9CH_3$ = 192 17 *alpha-* Colorless scales, m 200, soluble in alcohol, ether and benzene *beta-* White crystals, m 24 5, d 1 168, slightly soluble in water soluble in alcohol or ether **nitro-** $C_{14}H_9NO_2$ = 223 15 α-Nitrosoanthrone Yellow needles, m 146, insoluble in water and alcohol, soluble in benzene or carbon disulfide **peri-** Chrysazol **tetradecahydro-** a perhydride **tetrahydroxy-** Anthratetrol **trihydroxy-** See anthratriol, *anthrarobin*

a blue Alizarin blue **a carbinol** Anthryl carbinol, $C_{14}H_9CH_2OH$ **a carboxylic**

acid Anthroic acid **a diol** * Anthradiol **a dione** Anthraquinone **a oil** A product of coal tar distillation (above 270°C) containing a with carbazole, phenanthrene, etc **a perhydride** $C_{14}H_{24}$ = 192 2 Saturated anthracene  Colorless needles, m 88, b 270, soluble in alcohol **a sulfonic acid** Anthraquinone sulfonic acid **a tetrol** Anthratetrol **a tetrone** Anthradiquinone A group of ketone derivatives containing four oxygen atoms attached to the a ring, there are 1 4 9, 10- and 1 4 5, 9- **a triol** Anthratriol **a violet** Gallein

anthracenol Anthrol

anthracenone Anthrone

anthrachrysone $C_{14}H_8O_6$ = 272 13 Anthraquinone-1 3 5 7-tetrol, 1 3 5 7-tetrahydroxyanthraquinone, anthrachrysazin Orange red crystals, m 360, insoluble in water or ether, but soluble in alcohol

anthracine (1) A ptomaine produced by the anthrax bacillus (2) Anthracene Cf *anthrazine*

anthracite Stone coal A bright, lustrous, hard, brittle mineral coal, q v , containing 2–8 % of volatile carbon on a mineral-free basis, d 1 3–1 8 In a the mineralization of wood has been carried a stage farther than in coal **meta-** Contains less than 2 % of volatiles **semi-** Contains 8–14 % of volatiles

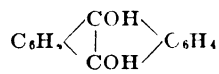
anthracometer A device for determining the amount of CO_2 in gas mixtures

anthraconite Stinkstone An earthy amorphous form of calcium carbonate containing bituminous matter

anthracyl The monovalent $C_{14}H_7$—radical derived from anthracene There are the three isomers α-, β-, and γ-

anthradiamine $C_{14}H_{12}N_2$ = 208 11 Anthracenediamine*, $C_{14}H_8(NH_2)_2$ Pale yellow needles m 160

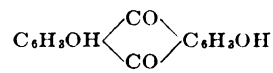
anthradiol $C_{14}H_{10}O_2$ = 210 15 Anthrahydroquinone, anthra-quinol, oxanthranol *9 10*-anthracenediol*, 5 10- or *9 10*-dihydroxyanthracene The compound



Yellowish needles, m 180, insoluble in water 1 6- or *1 5*- Rufol 1 9- or *1 8*- Chrysazol *2 6*- Flavol **1 2-** *1 2*-Anthracenediol* Green leaflets, m 160

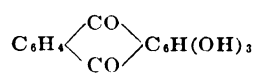
anthradiquinone Anthracene tetrone

anthraflavic acid $C_{14}H_8O_4$ = 240 13 *2 6*- or *2 7*-dihydroxyanthraquinone



Yellow needles, m 330, insoluble in water or ether **iso-** See *isoanthraflavic* acid

anthragallol $C_{14}H_8O_5$ = 256 03 1 2 3-trihydroxanthraquinone, alizarin brown



Brown needles, m 310, soluble in alcohol or ether, and in alkalis (green color) Used as a dye, and in the manufacture of dyes

anthraglucorhein A glucoside from *Rheum* species It is a brown powder, soluble in alcohol, used as a cathartic

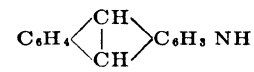
anthraglucosagradin A glucoside from *Cascara sagrada* A brown powder, soluble in alcohol used medicinally as a cathartic

anthraglucosennin A glucoside from *Cassia angustifolia* A dark-brown powder, soluble in alcohol, used as a cathartic

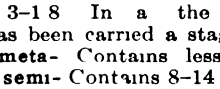
anthrahydroquinone Anthradiol

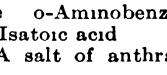
anthraldehyde $C_{14}H_9CHO$ = 208 08

anthramine $C_{14}H_{11}N$ = 193 17 Aminoanthracene, anthrylamine,



β- or **2-** Yellow needles, m 237, sparingly soluble in water, readily soluble in alcohol or ether **γ-** or **5-** or **ms-** Yellow crystals, m 146, soluble in alcohol Used in the manufacture of dyes

anthranil C_7H_5ON = 119 09 Anthroxan o-aminobenzoic acid lactam, anthranilic acid lactam, benzo-ψ-oxazole, β,γ-benzisoxazole  Colorless crystals or liquid, d 1 189, m 18, b 210, slightly soluble in alcohol, soluble in alkalis **iso-** 1-o-aminobenzoic acid lactam

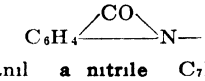


a aldehyde o-Aminobenzaldehyde **a carbonic acid** Isatoic acid

anthranilate A salt of anthranilic acid, NH_2-C_6H_4COOM

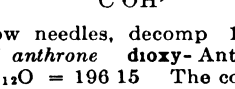
anthranilic acid $C_7H_7O_2N$ = 137 1 o-Aminobenzoic acid, $NH_2C_6H_4COOH$ Yellow crystals, m 144, soluble in water, alcohol or ether, used in the manufacture of dyes and perfumes Cf *anthranoyl* ***N*-carboxy-** Isatoic acid **dinitro-** See *chrysalic* acid, *chrysanisic* acid **a di-*n*-propylaniline** An indicator changing at pH 5 5 from red (acid) to yellow (basic) **oxalyl-** Kynuric acid

anthranilo The monovalent radical

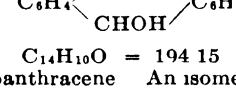


from anthranil **a nitrile** $C_7H_6N_2$ = 118 08 *o*-Aminophenylcyanide, o-aminobenzonitrile, $NH_2C_6H_4CN$ Yellowish prisms, m 50, b 264

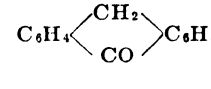
anthranol $C_{14}H_{10}O$ = 194 15 *9*-Hydroxyanthracene*, γ-hydroxyanthracene, 5-anthrol ms-oxyanthracene



Pale yellow needles, decomp 160, soluble in ether Cf *anthrone* **dioxy-** Anthrarobin **hydro-** $C_{14}H_{12}O$ = 196 15 The compound



anthranone $C_{14}H_{10}O$ = 194 15 Anthrone dihydroketoanthracene An isomer of anthranol

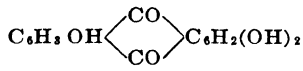


10-hydroxy- Oxanthrone **nitroso-** Nitro-*anthracene*

anthranoyl The monovalent radical $H_2N\,C_6H_4\,CO$—, from anthranilic acid

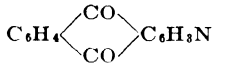
anthranylamine Anthramine

anthrapurpurin $C_{14}H_8O_5$ = 256 13 *1 2 7-* or 1 2 8-trihydroxyanthraquinone



Orange needles, m 325, slightly soluble in water or ether, soluble in alcohol Used in the manufacture of dyes **a diacetate** Purgatol

anthrapyridine alpha- 6 7-Benzoquinoline **beta-** 6 7-Benzo-*a*-quinoline **a -quinone** $C_{11}H_7O_2N$ = 185 1 The heterocyclic ketone

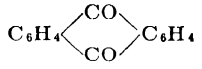


beta- Colorless crystals, m 280, soluble in water or alcohol

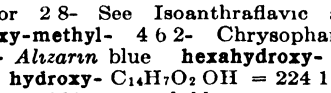
anthraquinol Anthradiol

anthraquinoline $C_{17}H_{11}N$ = 229 2 Naphthoquinoline Colorless crystals, m 170, b 446, insoluble in water, soluble in alcohol or ether

anthraquinone $C_{14}H_8O_2$ = 208 1 Dihydrodiketo-anthracene The compound

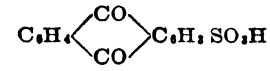


Pale yellow needles, d 1 410–1 438, m 285, b 380, insoluble in water, soluble in alcohol or ether It is a constituent of *Cassia*, *Aloe*, *Mirabilis* and *Rumex* species, and is manufactured by oxidation of anthracene Used in the manufacture of alizarin and other dyestuffs **amino-** $C_{14}H_7O_2NH_2$ = 223 15 Anthraquinoylamine **1-** or *α-* Red, iridescent needles, m 242, insoluble in water, soluble in alcohol or ether Used in organic synthesis for the preparation of alizarin-blue, cyananthrol, and other dyes **2-** or *β-* Red needles, m 302, insoluble in water, soluble in alcohol or ether Used in organic synthesis in the preparation of indanthrene, flavanthrene and other dyes *2-amino-1-hydroxy-* $C_{14}H_9NO$ = 239 08 *β*-Alizarinamide, $NH_2\,C_{14}H_6O_2\,OH$ Brown needles, m 226 **bromo-** $C_{14}H_6O_2Br$ = 286 97 Yellow crystals **1-** m 188 **2-** m 204 **chloro-** $C_{14}H_6O_2Cl$ = 242 51 Pale yellow needles, **1-** m 162 **2-** m 211, insoluble in water **dihydroxy-** 1 2- Alizarin 1 3- Xanthopurpurin 1 4- Quinizarin *1 5* or 1 6- Anthrarufin *1 8-* or 1 9- Chrysazin 2 3- Hystazarin *2 6-* or 2 7- Anthraflavic acid *2 7-* or 2 8- See Isoanthraflavic acid **dihydroxy-methyl-** 4 6 2- Chrysophanic acid **dioxy-** *Alizarin* blue **hexahydroxy-** Rufigallic acid **hydroxy-** $C_{14}H_7O_2\,OH$ = 224 1 Yellow leaflets, m 302, very soluble in water, alcohol, or ether **methyl-** $C_{14}H_7O_2Me$ = 222 2 Yellow crystals, m 177, soluble in alcohol, ether or benzene **nitro-** $C_{14}H_7O_2\,NO_2$ = 253 1 Yellow needles, m 228, insoluble in water, soluble in alcohol or ether **pentahydroxy-** Alizarin cyanine **tetrahydroxy-** The compounds *1 2-5 6-* or *rufiopin* *1 2 5 8-* or *quinalizarin* *1 3 5 7-* or *anthrachrysone*



tetrahydroxy-methyl- Fisetin **trihydroxy-** 1-2 3- Anthragallol 1 2 4- See Purpurin *1 2-6-* or 1 2 7- Flavopurpurin *1 2 7-* or 1-2 8- Anthrapurpurin **trihydroxymethyl-** See *morin* and *emodin* **trioxy-** Trihydroxy-

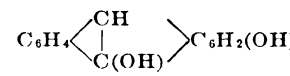
a acridine Naphthacridine-dione **a acridone** Naphthacridine-trione **a aldehyde** 5 10-dihydro-5 10-diketo-anthraldehyde **a methide** 5-methylene-anthrone **a sulfonic acid** *β*-acid, alizarin sulfonic acid



An intermediate in the manufacture of alizarin It is obtained by heating anthraquinone with conc H_2SO_4 at 200-260°C Cf *silver* salt **a tetrol** Tetrahydroxy a **a triol** Trihydroxy a

anthraquinonic acid Alizarin

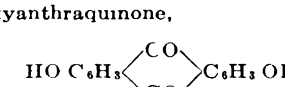
anthrarobin $C_{14}H_{10}O_3$ = 226 1 Dioxyanthranol, 2 3 9-anthratriol, 2, 3, 9-trioxyanthracene, leuko-alizarin, desoxyalizarin,



A yellowish, granular powder, insoluble in water, soluble in hot alcohol Used in the treatment of skin diseases, and as a substitute for chrysarobin

anthrarobinate A salt of anthrarobin

anthrarufin $C_{14}H_8O_4$ = 240 1 *1 5-* or 1 6-dihydroxyanthraquinone,

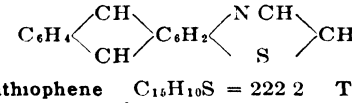


Yellow leaflets, m 280, soluble in water or benzene

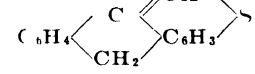
anthrasol A colorless coal tar which is used medicinally in ointments

anthratetrol $C_{14}H_6(OH)_4$ = 242 15 Tetrahydroxyanthracene A group of tetraatomic hydroxy derivatives of anthracene

anthrathiazine $C_{16}H_{11}NS$ = 249 2



anthrathiophene $C_{15}H_{10}S$ = 222 2 The heterocyclic compound

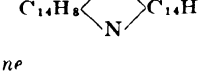


anthratriol $C_{14}H_7(OH)_3$ = 196 15 Trihydroxyanthracene A group of triatomic hydroxy derivatives of anthracene, as, anthrarobin

anthraxolite A metamorphic coal resembling anthracite It is the end-product in the metamorphosis of petroleum

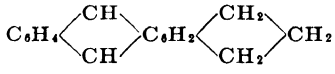
anthraxylon A constituent of coal of botanical origin See vitrain (*coal*)

anthrazine $C_{28}H_{16}N_2$ = 380 2 Anthracene diazine The compound

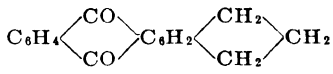


Cf *anthracene*

anthrindan $C_{17}H_{14}$ = 218 2 The aromatic hydrocarbon



anthrindandione $C_{17}H_{12}O_2$ = 248 2 The quinone of anthrindan, which corresponds with anthraquinone

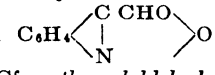


anthroic acid $C_{15}H_{10}O_2$ = 226 16 Anthracene carboxylic acid* $C_{15}H_{10}O_2$ = 226 16 The compound $C_{14}H_9COOH$ **α-** or **1-** Yellow needles, m 260 (sublimes), insoluble in water, soluble in alcohol or ether **β-** or **2-** Small yellow leaflets, m 280 (sublimes), insoluble in water, soluble in alcohol or ether **γ-** or **5-** Yellow needles, decomp 206, soluble in water or alcohol These acids are used in organic synthesis and in the manufacture of dyes

anthrol $C_{14}H_{10}O$ = 194 15 Hydroxy-anthracene **1-** Colorless needles, m 153 **3-** or **2-** Colorless needles decomp 200, soluble in alcohol, ether, or acetone **γ-** or **5-** (or **9-**) Anthranol

anthrone Anthranone

anthroxan Anthranil **a aldehyde** $C_8H_5O_2N$ = 147 1 The compound



Colorless crystals m 72 Cf *anthranilaldehyde*

anthryl The monovalent radicals $C_{14}H_9$—, derived from anthracene There are five isomers **a amine** Anthramine **a carbinol** Anthracenecarbinol

anthrylene The divalent radicals —$C_{14}H_8$—, derived from anthracene There are eleven isomers

anti A prefix derived from the Greek indicating (1) against or opposed, (2) antiposition **a position** Opposite to the *syn*-position, q v Cf *stereoisomerism*

antiabrin A substance formed in the blood after the injection of abrin

antiagglutinin A substance of the blood which prevents agglutination

antiaggressin A substance formed in the body counteracting the action of aggressins

antialbumid A decomposition product of albumin formed during gastric and pancreatic digestion

antialbuminate Antialbumate, parapeptone An incompletely digested albumin Cf *syntonin*

antialexin A substance in the blood opposing the action of alexin

antiamboceptor A substance given off by protoplasm in order to combine with the cytophilic group of an amboceptor Cf *Ehrlich* side-chain theory

antianaphylactin A substance counteracting anaphylactin Cf allergen

antiantibody A substance formed in the blood of an organism after the injection of an antibody Cf *antimmune*

antiantidote A substance which opposes the action of an antidote

antiantienzyme A substance which opposes

antiar The milky juice of the upas (Javanese) or ipoh (Malayan) tree, *Antiaris toxicaria*, found in Malacca and Java, and used as an arrow poison

antiarin (1) $C_{14}H_{20}O_5$ = 268 16 A glucoside of antiar It is a muscle poison and the active constituent of an arrow poison used by East Indian tribes (2) $C_{14}H_{20}O_5 \cdot 2H_2O$ = 304 2 The active principle of antiar

antiarthrin A condensation-product of gallic acid and saligenin A brown powder, soluble in alcohol and alkalis, and used in uric acid diathesis

antiarthritic A drug that prevents or relieves arthritis, as, atophan, colchicum Cf *antipodagric*

antiasthmatic A drug relieving asthma, *e g*, atropine, chloroform, morphine, papaverine

antibacterial A substance which checks the growth of bacteria Cf *antiseptic, antimycotic, disinfectant*

antiberberin A black liquid prepared from rice and used to treat beri-beri

antiberiberi Is vitamin B

antibilious A drug that relieves a bilious condition

antibiotic A substance destructive to life, a poison

antiblennorrhagic A drug used in preventing or treating gonorrhea, *e g*, methylene blue, potassium permanganate, silver salts

antibody A substance in the body fluids of animals, which is formed after an injection and counteracts the effects of the injected substance Antibodies consist of agglutinins, amboceptors, antienzymes, antitoxins, bacteriolysins, cytolysins, hemolysins, opsonins and precipitins, (see *Ehrlich's* theory)

anticachectic A drug used in the treatment of malnutrition

anticatalase A substance opposing the action of a catalase

anticatalyzer A substance that inhibits the action of a catalyst

anticatarrhals Any drug subduing the inflammation of mucous membranes (bladder, bronchis, nose)

anticathode Target An electrode in a vacuum tube placed in such a position relative to the cathode that the rays from the latter impinge on or are reflected from it See vacuum *tubes*, *X-ray* tube

antichlor A chemical used to remove Cl after bleaching, as, $Na_2S_2O_3$

anticholerin A substance derived from cultures of cholera bacillus and used in the treatment of cholera

anticoagulin A substance that prevents the coagulation of blood or milk

anticol A colloidal antimony solution used as parasiticide

anticomplement A substance formed by using cells to combine with the haptophore group of the complement See *Ehrlich* side-chain theory

anticrotin The antitoxin of crotonallin

anticytolisis *Complement* fixation

anticytotoxin A substance opposing the action of cytotoxins

antidiabetic A drug used in the treatment of diabetes

antidimmer A preparation which prevents moisture from accumulating on glass

antidote An agent counteracting or neutralizing the action of a poison on an organism **chemical-** A substance which precipitates or alters the poison, as, oils, soaps, white of egg, iron salts, etc **mechanical-** A means of removing the poison from the system, *e g*, stomach pump **physiological-** A drug which counteracts the poison by having an opposite effect **universal-** (1) A solution of 2 pts magnesia and 1 pt iron sulfate in water (2) A mixture of 2 pts charcoal, 1 pt magnesium oxide and 1 pt tannic acid in water A tablespoon-full is given for an unknown poison

antidysenteric A drug which checks or prevents diarrhea, *e g*, bismuth salts, emetin, tannin

antiemetic A drug which prevents vomiting, *e g*, bismuth subnitrate, cerium oxalate

antienzyme Any substance that inhibits the actions of enzymes

antierrhine A drug which diminishes nasal discharges

antifebrin A proprietary brand of acetanilide

antiformin Hychlorite A strongly alkaline solution of sodium hypochlorite, used as a disinfectant and in bacteriology

antifreeze Any substance which is added to the radiator water of automobiles or aeroplanes to prevent freezing, without injuring the metal parts or deteriorating after continued use, *e g*, alcohol or ethylene glycol

antifriction alloy An alloy used for bearings to reduce the friction of an axle

antifungin Magnesium borate, used as a gargle in diphtheria

antigalactic A drug that diminishes the secretion of milk, *e g*, atropine, camphor

antigen A substance which, when injected into an organism, causes the formation of antibodies Antigens are either (1) *toxins* (a) bacterial (diphtheria, tetanus), (b) vegetable (ricin, abrin), (c) animal (snake, spider, toad venoms), (2) *ferments* or *enzymes* (lipase, rennin etc), (3) *precipitinogens* (vegetable and animal proteins), (4) *agglutinogens* (bacteria erythrocytes), (5) *opsogens* (aggresins or bacterial endotoxins), (6) *lysogens* (vegetable or animal cells) See *Ehrlich's* theory

antiglobulin A precipitin that coagulates globulin

antiglyoxalase A substance which counteracts the action of glyoxalase

antihemolysin A substance which opposes the effect of a hemolysin

antihemolytic An agent that prevents hemolysis

antihidrotic Anhidrotic

antihypo Potassium percarbonate, used in photography

antimmune A substance or agent that prevents immunity, *e g*, an anti-antibody

antikinase A substance which opposes the action of kinase

antiknock An agent that prevents *knock*, q v, in the internal combustion engine, *e g*, lead tetraethyl

antilab Antirennin

antilactase An enzyme that counteracts the action of lactase

antilipase A substance which opposes the action of a lipase

antilithic A drug which prevents the formation of urinary stones, *e g*, colchicine, salicylates

antiluetic Anti-syphilitic

antiluetin Potassium ammonium antimonic bitartrate $SbO(C_4H_4O_6)_2K(NH_4)_2\,H_2O$, used in the treatment of syphilis

antilysin A substance formed in the blood of an organism which destroys the lysins of the bacteria, *e g*, the alexins can destroy bacteria

antilyssic A drug used in the treatment of rabies

antimalarial A drug relieving or preventing malaria, *e g*, quinine

antimalum A mixture of essential oils, chiefly camphor oil used externally for treating rheumatism

antimellin A glucoside from the bark of *Eugenia jambolana*, a Myrtaceae, used in treating diabetes

antimers Enantiomers, optical antipodes A pair of isomers differing in structure like an object and its mirror image, they are identical in all properties, except those which can be described as right and left (+ and −), *e g*, hemihedral crystal form and direction of rotation of the plane of polarized light

antimicrobin A substance of the blood which destroys the bacteria present

antimonate Antimoniate, stibnate, stibiate, stibate A salt of antimonic acids, (q v), viz

ortho-antimonate	M_3SbO_4
meta-	$M_4Sb_2O_5$ or $MSbO_3$
pyro-	$M_4Sb_2O_7$

antimonial glass Antimonous sulfide **a lead** Hard lead An alloy of 15 parts of antimony and 85 parts of lead, which is resistant to sulphuric acid **a nickel sulfide** Ullmannite **a silver** Dyscrasite The native silver antimonide, Ag_3Sb **a saffron** Antimonous oxysulfide

antimoniate Antimonate

antimonic A compound of pentavalent antimony, $=Sb\equiv$ **a acid** *ortho-* H_3SbO_4 = 187 2 A white powder, d 6 6, decomp when heated, slightly soluble in water or alcohol, soluble in acids *meta-* $HSbO_3$ = 169 21 A white powder, sparingly soluble in water *pyro-* $H_4Sb_2O_7$ = 356 43 A colorless powder, slightly soluble in water, soluble in alkalis **a chloride** $SbCl_5$ = 295 5 Antimony pentachloride A fuming yellowish liquid, $d_{20°}$ 2 346, m −6, b_{30mm}92, decomp in water or alcohol, soluble in acids It is a reagent for alkaloids **a fluoride** SbF_5 = 215 2 Antimony pentafluoride An oily liquid, $d_{22°}$ 2 99, soluble in water **a oxide** Sb_2O_5 = 320 4 Antimonic acid anhydride, antimony pentaoxide, antimony peroxide A colorless or yellowish powder, d 3 78, insoluble in water or alcohol and soluble in acids, bases or potassium iodide solution **a oxychloride** $SbOCl_3$ = 243 28 A yellow powder decomp when heated, insoluble in water, soluble in alcohol **a sulfide** Sb_2S_5 = 400 8 Antimony pentasulfide, antimony persulfide Orange-yellow powder, $d_{0°}$ 4 120, insoluble in water, alcohol, or ether soluble in alkalis and acids It is a diaphoretic, emetic and expectorant

antimonide Stibide A binary compound of antimony, analogous to arsenides, bismuthides, etc

antimonii The official Latin for "of antimony," antimonic or antimonous compounds

antimonine *Antimony* lactate

antimonious Antimonous

antimonite (1) A salt of antimonous acids, (q v), as, Na_3SbO_3 (2) Antimony glance **sulf-** A salt of sulfantimonous acid containing the trivalent radical, $\equiv SbS_3$, as $(NH_4)_3SbS_3$

antimonium Antimony

antimonous Stibous, stibious, stibnous, antimonious A compound of trivalent antimony, $Sb\equiv$ **a acid** *ortho-* H_3SbO_3 = 171 *meta-* $HSbO_2$ = 153 21 This acid is hypothetical but forms salts *pyro-* $H_4Sb_2O_5$ = 327 5 A white precipitate, which forms the trioxide when heated **a arsenate** A mixture of a oxide and arsenic acid, used in skin diseases **a arsenite** A mixture of a oxide and arsenous acid used in skin diseases **a basic chloride** Same as a oxychloride **a bromide** $SbBr_3$ = 361 3 Antimony tribromide Yellow rhombic crystals $d_{23°}$ 4 148, m 94 2, b 280, hydrolyzes in water, and soluble in acids, carbon disulfide, or alkalis **a chloride** $SbCl_3$ = 228 3 Antimony trichloride, butter of antimony White rhombic crystals, $d_{26°}$ 3 064, m 73 2 b 223 5, sparingly soluble in water, and soluble in alcohol, carbon disulfide, alkalis or acids Antimony butter is a clear, acid, fuming solution d 1 35 Used externally as a caustic as a mordant, for manufacturing antimony salts, and for staining iron and copper articles **a fluoride** SbF_3 = 178 97 Antimony trifluoride Gravish-white octahedral crystals, d 4 379 m 292 soluble in water It is a constituent of DeHaen s salt (q v), used in ceramics and as a mordant **a fluoride and ammonium sulfate** DeHaen's salt **a hydride** SbH_3 = 124 79 Stibine A colorless, poisonous gas, d $(_{air=1})$ 4 344 m −91, b −18, sparingly soluble in water, soluble in alcohol or carbon disulfide **a iodide** SbI_3 = 502 97 Antimony triiodide It occurs in three allotropic forms (1) Red *hexagonal* crystals, $d_{20°}$4 848, (2) red *monoclinic* crystals $d_{22°}$4 768 (3) yellow *rhombic* crystals, m 170 8, b 401° It decomp in water, soluble in alcohol, carbon disulfide, hydrochloric acid or potassium iodide solution Used medicinally as an alterative, and externally in ointments for skin diseases **a nickel** The native alloy NiSb **a oxalate** $SbO(C_2O_4)_2$ = 313 77 Antimonyl oxalate A white powder, soluble in acids, and used as a mordant, especially as the potassium salt **a oxide** Sb_2O_3 = 291 24 Antimony trioxide, antimonous acid anhydride, valentinite, antimony bloom, a glass Sb_4O_6 Rhombic, colorless crystals, d 5 6 m 655, b 1560, insoluble in water, soluble in acids or tartaric acid It is a powerful reducing agent, used medicinally as an expectorant and emetic **a oxychloride** SbOCl = 173 47 Algaroth, mercurius vitae, basic antimony chloride White regular crystals, insoluble in water, soluble in acids, carbon disulfide or alcohol Used in the manufacture of tartar emetic and as an emetic and purgative **a oxyiodide** SbOI = 262 8 A yellow crystalline powder, insoluble in water **a oxysulfide** $Sb_2S_3\ Sb_2O_3$ = 630 6 Antimony flowers, a red a vermilion, antimonial saffron A double salt of antimonous sulfide and oxide, of varying composition, containing some $SbOS_2$ (crocus metallorum) A gray-brown powder, soluble in hydrochloric acid and used in the vulcanization of rubber **a sulfate** $Sb_2(SO_4)_3$ = 528 0 A white powder, soluble in acids **a sulfide** Sb_2S_3 = 340 0 Antimony trisulfide Stibnite, antimony red, black antimony sulfide A gray-black powder or red crystals d 4 62 m 555 insoluble in water soluble in acids and alkali sulfide solutions Used as a diaphoretic or alterative, as a pigment in the manufacture of safety matches, Bengal fire, torpedoes, cartridges, etc , in enameled iron ware, and as an *opacifier*, q v

antimony Sb = 121 76 Stibium A metal of the arsenic or nitrogen family and element atomic number 51 A rhombohedric, bluish-white, brittle substance of lustrous, metallic appearance, d 6 62, m 630 b 1440, insoluble in water, dilute acids or alcohol, soluble in concentrated sulfuric acid or aqua regia Basilius Valentinus described its preparation and properties in 1450 It is found native, but more frequently as sulfide (stibnite), and as antimonides and sulfantimonides of the heavy metals Antimony occurs in three allotropic modifications (a) ordinary metallic or β-antimony, Sb_1, (b) an unstable, yellow or α-antimony, Sb_4, and (c) amorphous, black antimony, Sb_2, d 5 3, which on heating changes to the metallic modification Antimony is tri- and penta-valent, and resembles arsenic and phosphorus in its chemical behavior, it forms the following series of compounds

Derived from trivalent antimony –

antimonous (stibnous)	Sb^{+++}
stibines	SbR_3
antimonites	SbO_2^-
antimonyl	SbO^+

Derived from pentavalent antimony—

antimonic (stibnic)	Sb^{+++++}
stibonium	R_4SbX
meta-antimonate	SbO_3^-
ortho-antimonate	SbO_4^{---}

Antimony is used extensively as a constituent of important alloys (Britannia metal, type metal, pewter), and in the preparation of antimony compounds, which are used in medicine and as pigments **black-** Antimonous sulfide **butter of-** Antimonous chloride **flowers of-** Antimonous oxysulfide **gray-** a glance **red-** (1) Kermesite (2) Antimonous oxysulfide **white-** Valentinite

a anhydride See *antimonous* or *antimonic* oxide **a arsenide** Allemontite **a ash** See *antimony* oxides **a black** Antimonous sulfide **a blende** Antimony glance **a butter** Antimonous chloride **a bloom** Antimonous oxide **a chlorides** See *antimonous-*(*ic*) chloride and oxychloride **a crocus** An antimonous oxysulfide formed by the deflagration of equal parts of antimonous sulfide and saltpeter **a fluoride** See *antimonous*(*ic*) fluoride **a flowers** Antimonous oxysulfide **a glance** Antimonite, stibnite, antimony blende, grey antimony A native antimonous sulfide **a glass** Antimonous oxide **a lactate** $Sb(C_3H_5O_3)_3$ = 389 97 Antimonine Yellow crystals, soluble in water, used as a mordant in the dye industry **a minerals** Antimony occurs in nature closely associated with arsenic and bismuth minerals, in addition to the antimonides and sulfantimonides of the heavy metals, it is found as

native antimony	Sb
stibnite (a glance)	Sb_2S_3
kermesite (q v)	Sb_2S_2O
senarmontite (valentinite, q v)	Sb_2O_3
cervantite	Sb_2O_4

Cf *plagionite*, *antimonous* nickel **a mordants** See *antimonous* fluoride, a lactate and a potassium tartrate **a needles** Antimonous sulfide **a ochre** Stibiconite **a oxides** There are three oxides

Sb_2O_3—antimony trioxide See *antimonous* oxide
Sb_2O_4—antimony tetroxide, q v
Sb_2O_5—antimony pentoxide See *antimonic* oxide

a pentachloride Antimonic chloride **a pentafluoride** Antimonic fluoride **a pentamethyl** $Sb(CH_3)_5$ = 197 17 Pentamethyl stibine A colorless liquid b 97, insoluble in water **a pentasulfide** Antimonic sulfide **a pentoxide** Antimonic oxide **a peroxide** Antimonic oxide **a persulfide** Antimonic sulfide **a potassium oxalate** $SbK_3(C_2O_4)_3 \cdot 6H_2O$ = 611 97 A white powder, soluble in water, and used as a mordant in the dye industry **a potassium tartrate** $[SbOK(C_4H_4O_6)]_2 H_2O$ = 667 82 Tartar emetic, antimonyl potassium artrate, tartar stibiatus Colorless octahedral crystals, d 2 6, soluble in water or alcohol Used medicinally as an emetic, expectorant and diaphoretic, in the dye industry as a mordant for textiles and leather, also as a reagent in qualitative analysis **a red** Antimonous oxysulfide **a regulus** Metallic antimony **a salt** DeHaen's salt **a sulfate** Antimonous sulfate **a sulfuret** Antimonous sulfide **a sodium sulfate** a trifluoride sodium sulfate $SbF_3 Na_2SO_4$ **a sodium thioglycollate** A white powder used as a trypanosomicide **a sulfide** See *antimonous(ic)* sulfide **a tetroxide** Sb_2O_4 = 307 54 Cervantite A colorless powder, d 4 07, insoluble in water, soluble in alkalis or acids **a thioglycollamide** $Sb(S\,CH_2CONH_2)_3$ = 392 06 White crystals, m 139, slightly soluble in water, used as trypanosomicide **a tribromide** Antimonous bromide **a trichloride** Antimonous chloride **a triethyl** $Sb(C_2H_5)_3$ = 209 12 Triethylstibine A colorless liquid, $d_{16°}$ 1 324, b 158 5, insoluble in water and miscible with alcohol or ether **a trifluoride** Antimonous fluoride **a trifluoride sodium sulfate** $SbF_3 Na_2SO_4$ = 320 8 A white crystalline solid, soluble in water **a trimethyl** $Sb(CH_3)_3$ = 167 00 Trimethylstibine A colorless liquid, $d_{15°}$ 1 523, b 80 6, insoluble in water and miscible with alcohol or ether **a trioxide** Antimonous oxide **a triphenyl** Triphenyl *stibine* **a trisulfate** Antimonous sulfate **a trisulfide** Antimonous sulfide **a vermilion** Antimonous oxysulfide **a white** Antimonous oxide **a yellow** Basic *lead* antimonate

antimonyl The monovalent radical, SbO— **a aniline tartrate** A yellow crystalline compound used to treat trypanosomiasis **a compound** A basic substance containing the antimonyl radical **a oxalate** Antimonous oxalate **a potassium tartrate** Antimony potassium tartrate **a sulfate** $(SbO)_2SO_4$ = 375 27 A white amorphous powder *basic*- $(SbO)_2SO_4 Sb_2(OH)_4$ = 676 89 A colorless powder

antimosan Potassium antimonyl pyrocatechol disulfonate A white powder used in the treatment of schistosomiasis

antimycotic Antibacterial

antinarcotic A drug which opposes the action of narcotics

antineuralgic A drug used in the treatment of neuralgia, *e g*, acetanilide, opium, phenacetin, quinine, salicylates

antineuritic vitamin Vitamin B

antinonnin $C_6H_2(NO_2)_2CH_3ONa$ Sodium-o-dinitro cresolate Victoria yellow A yellow, odorless paste, used as a germicide and plant spray

antinosin $C_6H_2I_2ONa_2\,CO\,O_6H_4O$ Sodium tetraiodo phenolphthalein Nosophen sodium A dark blue amorphous powder, soluble in water Used as an iodoform, antiseptic substitute, and for rendering visible the gallbladder by means of x-rays

antioxidant Age-resistor A substance which retards the deterioration of rubber, such as tannic acid, hydroquinone or aniline

antiparasite Antiparasitic

antiparasitic A drug which inhibits the growth of vegetable and animal parasites

antipepsin A substance which prevents the action of pepsin

antiperiodic A drug used to treat malaria, *e g*, cinchona, quinine

antiphlogistic A drug which inhibits the progress of inflammation, *e g*, aconite, veratrum, mercury used internally, and glycerin used locally **a theory** A theory proposed by Lavoisier which was in direct contradiction to the older phlogiston theory (q v)

antipodagric A drug used in the treatment of gout, *e g*, colchicum, salicylates

antipode An antimer, q v

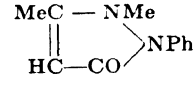
antipyonin Sodium tetraborate

antipyrene Antipyrine

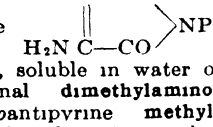
antipyretic A drug relieving fever, as, aconite, acetanilide, antipyrine, cinchona

antipyreticin Resalgin

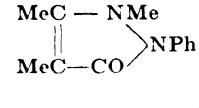
antipyrine $C_{11}H_{12}ON_2$ = 188 17 Antipyrene, analgesine, phenazone, 2 3-dimethyl-1-phenyl-5(2)-pyrazolone, dimethyloxy-chinozine, phenyl dimethyl pyrazolone, pyrazole, anodynin, sedatine, methozan, parodyn, phenylon, oxydimethyl quinizine, dimethyloxyquinizine, pyrazin, metozine



White leaflets or powder, $d_{20°}$ 1 19, m 113, soluble in water, alcohol, or ether It is an antipyretic, sedative, antineuralgic, antirheumatic and a reagent for nitrous and nitric acid, and for the determination of iodine number **amido-** $C_{11}H_{13}ON_3$ = 203 2 1 phenyl-2 3-dimethyl-4-aminopyrazolone

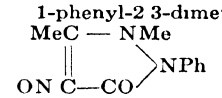


Colorless crystals, m 109, soluble in water or alcohol **chloral-** Hypnal **dimethylamino-** Pyramidon **homo-** *Homo*antipyrine **methyl-** $C_{12}N_{14}ON_2$ = 202 2 1-phenyl-2 3 4-trimethyl pyrazolone



Colorless crystals, m 82 **methylenedi-** Salubrol **methylethylglycol-** Astrolin **monobromo-** Bromopyrine **nitroso-** $C_{11}H_{11}O_2N_3$ =

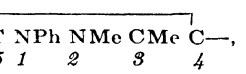
217 2 1-phenyl-2 3-dimethyl-4-nitrosopyrazolone



a benzoate Benzopyrine **a camphorate** A compound of antipyrine and camphor **a carbolate** Phenopyrine **a mandelate** Tussol **a monobromide** Bromopyrine **a phenate** Phenopyrine **a resorcylate** Resalgin **a salicylate** Salipyrine **a tannate** A compound of antipyrine and tannic acid A yellowish powder, insoluble in water

antipyretic A drug is used in the treatment of burns

antipyryl The monovalent radical,



derived from antipyrine

antiquinol Allylphenyl cinchonine ester A yellow crystalline substance, m 30, insoluble in water, soluble in alcohol or ether, used as an antiseptic and analgesic

antirachitic Effective against rickets, as, cod liver oil, calciferol

antirennin A substance found in blood serum which prevents the enzymic action of rennin

antirheumatic A compound which relieves rheumatism, *e g*, colchicine, lithium salts and salicylates

antirheumatin A compound of sodium salicylate and methylene blue Blue crystals, soluble in water and used as an antirheumatic

antiricin The substance which is formed in the blood of animals after the injection of ricin

antirobin The substance which is formed in the blood after the injection of robin

antiscorbutic A compound which is effective against scurvy by virtue of its ascorbic acid content, *e g*, lime or lemon juice

antisepsin C_8H_8ONBr = 213 99 Asepsin, acetanilide bromide, acetbromanilide Colorless crystals, used as an antipyretic and antiseptic

antiseptic A substance that opposes sepsis, putrefaction or decay by arresting the growth of micro-organisms, either by inhibiting their activity or by destroying them, *e g*, alcohol, boric acid, chlorine creosote, mercuric chloride, phenol, thymol, eucalyptol, iodoform Cf *disinfectant, germicide*

antiseptin A mixture of boric acid, zinc iodide and thymol, used as a dusting powder

antiseptol Cinchonine iodosulfate A reddish powder, used as a dusting powder in skin diseases

antispasmin $C_{23}H_{28}O_9NNa\ 3NaC_7H\ O_3$ Narcein sodium salicylate Narcein sodium and sodium salicylate A white hygroscopic powder used as an antispasmodic, sedative, and hypnotic Decomp in air

antispasmodic A drug relieving convulsions or spasms, *e g*, camphor, chloroform chloral, valerian, bromides

antisudorific A drug that prevents excessive perspiration Cf *anhidrotic*

antisyphilitic Antiluetic A drug used in the treatment of syphilis, *e g*, arsenic (cacodylates), mercury, iodides

antitetrazin A quinine derivative used as an antineuralgic

antithermin $C_{11}H_{14}O_2N_2$ = 206 2 Phenylhydrazine levulinic acid Colorless crystals, m 108, insoluble in water and soluble in alcohol or ether Used medicinally as an analgesic, antipyretic or antiseptic

antithrombin The substances of the blood which prevent coagulation

antitode A mixture of equal parts of magnesia, charcoal, and ferric hydroxide, used as an antidote in cases where the poison is unknown Cf *antidote*

antitoxic Antidote

antitoxin A protein antibody developed in the blood after the injection of a poison, a defensive protein derived from animals inoculated with a specific disease **diphtheria-** A preparation from the blood serum of animals infected with diphtheria **streptococcus-** A preparation from the serum of animals infected with streptococcus bacillus **tetanus-** A preparation from the serum of animals infected with tetanus Cf *antigen, antibody*

antitussin $(C_6H_4F)_2$ = 190 1 Difluordiphenyl Colorless crystals, m 87, used as an ointment in whooping cough

antivenom An antitoxin against snake venom

antodyne *Phenoxy* propandiol

antozone Mono-atomic oxygen

anysin Ichthyol

anytin Anitin A sulfurated hydrocarbon derived from ichthyol A brownish-black powder used as a germicide

anytol Anitol A compound of anitin and aromatic phenols and alcohols **cresol-** Metasol, meta-cresolanytol, used as a germicide, **eucalyptol-** Eucasol Used as a germicide and disinfectant

A O A C Association of Official Agricultural Chemists

apa- Apo-

apaconitine An alkaloid derived from aconitine

apagallin Mercury tetraiodophenolphthalein, used as an antiseptic and indicator Cf *mercurochrome*

apatite $3Ca_3(PO_4)_2CaF_2$ A native calcium fluophosphate occurring in various colored, hexagonal crystals Exported as fertilizer from Norway and Canada Cf *phosphorite, fluorapatite, osteolite, pyromorphite*

apatropine Apoatropine

aperient A laxative or mild purgative

apertometer See *Abbe* apertometer

aperture An opening into or through a body The diameter of the open part of an objective or lens

apex The top, highest or farthest point of a cone, curve or orbit

aphalerite A native zinc sulphide, similar to wurtzite

aphanesite The native copper arsenate, $2CuO, As_2O_3, 4H_2O$

aphanin A biologically-active carotenoid from blue algae

aphelion (1) The position of a celestial body when farthest away from the sun, as opposed to perihelion (2) Figuratively, the position of an electron in an elliptical orbit when farthest away from the nucleus Cf *apogee*

aphicide A substance that kills *Aphis* Cf *insecticide*

aphrite Earth foam, foamspar A white pearl-like variety of calcite

aphrizite Black *tourmaline*, q v

aphrodine Yohimbine

aphrodisiac A drug which arouses sexual desires, *e g*, nux vomica, phosphates, damiana

aphrodite $4MgO\ SiO_{10}H_6$ A native basic magnesium silicate, which occurs in meerschaum-like masses

aphrosiderite $(Fe, Al)Si_4O_{20}\ 5H_2O$ Dark, olive-green, soft, hexagonal scales of an iron aluminum silicate

aphthitalite $NaKSO_4$ A native sodium potassium sulfate, which forms colorless, hexagonal crystals Cf *glaserite*

aphthonite A steel-gray silver ore which consists mainly of tetrahedrite

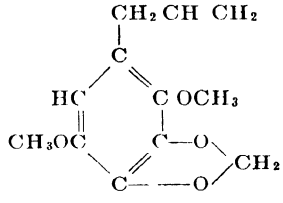
aphyl Alkyl

apigenin $C_{15}H_{10}O_5$ = 270 08 4′ 5 7-trihydroxyflavone A flavone, q v , from many flowers and plants, e g , parsley, and formed by hydrolysis of apiin

apiin $C_{27}H_{32}O_{16}$ = 612 3 A glucoside from the seeds of *Apium petroselinum* A yellowish crystalline powder, m 228, soluble in hot water or alcohol

apinol $C_{10}H_{18}O$ = 154 14 Apinolum, levomenthone A clear, amber-colored oil of pine-like odor obtained by the distillation of pine wood d 0 946, b 182, insoluble in water, soluble in alcohol Used as an antiseptic, germicide, and local anesthetic

apiole $C_{12}H_{14}O_4$ = 222 2 Parsley camphor, *2 5*-dimethoxysafrole, 2,5-dimethoxy-3,4-methenedioxy-1′-propenylbenzene,

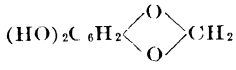


An aromatic ether occurring in the seeds of *Petroselinum* (parsley) and *Apium* (celery) Colorless, long needles of parsley odor, d 1 015, m 30 b 294, insoluble in water, soluble in alcohol Used medicinally as an emmenagogue and antiperiodic **iso-** Colorless crystals, d 1 197, m 56, b 304 **liquid-** The oleoresin of parsley seeds A green oily liquid, soluble in alcohol, chloroform or ether Used for the same purpose as apiol

apiolic acid $C_{10}H_{10}O_6$ = 226 08 Colorless crystals, m 175

apionol $C_6H_6O_4$ = 142 1 Phentetrol, v-tetrahydroxybenzene, $C_6H_2(OH)_4$ Colorless crystals m 161 **dimethyl-** $C_6H_2(OH)_2(OMe)_2$ = 170 1 1 2-dimethoxy-3,4-dihydroxybenzene Colorless crystals, m 106, b 298°C, soluble in alcohol **tetramethyl-** $C_6H_2(OMe)_4$ = 198 2 v-tetramethoxybenzene Colorless crystals, m 81

apionone $C_7H_6O_4$ = 154 1 1,2-methenedioxy-3, 4-dihydroxybenzene,



Colorless crystals m 69

apiose $C_5H_{10}O_5$ = 150 07 A methyl tetrose from the glucoside of celery and parsley leaves

aplite (1) A pink or red cobalt-silver ore from Canada See *alaskite* (2) A ceramic material mined in Virginia and composed chiefly of plagioclase with small amounts of microcline feldspar and sericite Composition $SiO_2$60, $Al_2O_3$24, CaO6, Na_2O6, K_2O3, $Fe_2O_3$0 2 %

aplome A yellowish green manganese garnet q v

apo-, apa- A prefix derived from the Greek "from" and indicating a derived compound as, apomorphine—derived from morphine

apoatropine $C_{17}H_{21}O_2N$ = 271 3 Apatropine atropamine An alkaloid derived from atropine by the action of nitric acid Colorless prisms m 61, insoluble in water, soluble in alcohol ether, or chloroform **a hydrochloride** $C_{17}H_{21}O_2N\ HCl$ = 307 7 White leaflets, m 238 soluble in water, alcohol, or ether **a sulfate** $(C_{17}H_{21}O_2N)_2\ H_2SO_4$ = 640 5 Colorless crystals, soluble in water

apobiotic Decreasing vital activity

apocamphoric acid Campho acid

apocholic acid $C_{24}H_{38}O_4$ = 390 27 A dehydration product of cholic acid

apochromatic A lens combination in which chromatic aberration is corrected by bringing to a common focus three spectral color rays Cf *achromatic*

apocodeine $C_{18}H_{19}O_2N$ = 281 3 An alkaloid derived from codeine as a colorless, amorphous gummy mass, sparingly soluble in water soluble in alcohol or ether **a hydrochloride** $C_{18}H_{19}O_2N\ HCl$ = 317 7 A yellowish-gray hygroscopic amorphous powder, soluble in water, used as an expectorant, sedative, hypnotic and emetic

apocrenic acid $C_{24}H_{12}O_{12}$ = 492 1 A brown amorphous substance derived from humus or crenic acid by oxidation, and also found in some mineral waters

apocyanines A group of cyanine dyes, q v , the nitrogen rings of which are directly united, as **erythro-** with 3 4′ attachment, **xantho-** with 3 2′ attachment

Apocynaceae The dogbane family A group of tropical and sub-tropical plants with a milk juice that is often poisonous There are 10 genera and 900 species of which the following yield drugs

roots

Apocynum cannabinum	Canadian hemp
Apocynum androsaemifolium	dogbane
Carissa schimperi	wabain

barks

Aspidosperma quebracho blanco	quebracho
Alstonia constricta	Australian fever bark
Alstonia scholaris	ditaine, chlorogenin
Holarrhena antidysenterica	conessine, kurchi
Melouetia nitida	guamachacine
Parameria vulneraria	tagulaway
Plumiera species	plumierine
Wrightia zeylanica	conessine

leaves

Nerium odorum	karabin nerianthi
Geissospermum species	geissine, pereirine, velosine
Urechites subcrecta	urechitine

seeds

Strophanthus kombe	strophanthus strophanthine, etc
Acocanthera venenata	ouabain, acocantherin
Thevetia species	thevetin, cerberin, cerberidin
Tanghinia venenifera	tanghinine

pocynamarin $C_{14}H_{18}O_3$ = 234 1 A glucoside from the rhizome of *Apocynum cannabinum*, or Canadian hemp It is used as a cardiac tonic Cf *cynotoxin, cymarigenin*

pocynein An active constituent, probably a glucoside, of *Apocynum cannabinum*, Canadian hemp White crystals soluble in alcohol Cf *apocynin*

pocynin A resinoid from *Apocynum cannabinum*, Canadian hemp which occurs as a brown, amorphous powder and contains apocynein

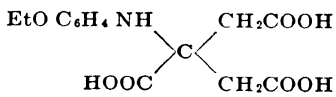
pocynoid The combined active principles of *Apocynum cannabinum*, Canadian hemp, used medicinally as a tonic, emetic, and cathartic

pocynum Canadian hemp, black Indian hemp, Indian physic, dogbane The dried rhizome and roots of *Apocynum cannabinum* It is a heart tonic resembling digitalis and is used as a fluid extract

pogee (1) The point in its orbit at which the moon is farthest from the earth, as opposed to *perigee* (q v) (2) Analogously the point in the orbit of an electron farthest from the nucleus Cf *aphelion*

pollinaris water A mineral water from Remage, Germany

polysin $C_{14}H_{17}O_7N$ = 311 2 Phenetidin citric acid, aconityl-phenetidine, monocitryl-p-phenetidin, 1-ethoxy-4-citrylaminobenzene,



A white, crystalline powder, m 72, soluble in hot water, alcohol, glycerol or ether Used as an antipyretic, antineuralgic and antiseptic

pomorphine $C_{17}H_{17}O_2N$ = 267 23 An alkaloid derived from morphine by the removal of one molecule of water A colorless, amorphous mass becoming green on exposure to air, sparingly soluble in water, soluble in alcohol or ether Used medicinally as an expectorant and emetic **a hydrochloride** $C_{17}H_{17}O_2N$ HCl = 303 71 Colorless or grayish monoclinic prisms, m 270, soluble in water or alcohol Used as an hypnotic, emetic and expectorant, and also hypodermically in cases of poisoning

pomyelin A compound prepared from brain matter, it is a phosphatide but contains no glycerol

ponal $C_6H_{13}NO_2$ = 131 09 *tert*- Amylcarbamate $NH_2COOCMe_2Et$ Colorless crystals, used as hypnotic Cf hedonal

pophyllite A native, calcium potassium fluosilicate, $KCa_4H_{16}Si_8O_{28}$, occurring in white or pinkish octahedral crystals

popinol Apiole

poquinamine $C_{19}H_{22}ON_2$ = 294 4 An alkaloid derived from quinamine by the removal of a molecule of water

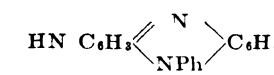
poquinine Homoquinine

poretin A resin from the roots of rhubarb A grayish-brown powder, insoluble in ether, but soluble in alkalis producing a dark-brown color

porphine $C_{17}H_{17}N$ = 235 12 A derivative of morphine

porrhegma The fragments of the aminoacids formed in the cells during the life of a plant or animal

posafranine $C_{18}H_{13}N_3$ = 271 11, Benzeneindu-line



aposafranone $C_{18}H_{12}ON_2$ = 272 11 Benzene indone, 3-aminophenylphenazine A red crystalline powder, m 242, soluble in water, alcohol or benzene Used as a dye

apothecaries' weight A system of weights and measures used in compounding medicines The troy pound of 5760 grains is the standard, and is subdivided into 12 ounces, the ounce into eight drams, the dram into 20 grains For fluid measure the quart of 42 fluid ounces is subdivided into 2 pints, the pint into 16 fl oz , the fl oz into eight drams, and the dram into 60 minims The following abbreviations are used

ℳ	minim = 0 0616 cc
gtt	gutta, a drop
℈	scruple = 20 grains = 1 296 grams
ʒ	dram = 60 grains = 3 888 grams
℥	ounce = 480 grains = 31 103 grams = 8 drams = 29 573 cc
lb	libra, a pound = 5760 grains = 373 2417 grams
O	octarius, a pint = 7680 minims = 473 16 cc

See *weights, conversion* factors

apothesine $C_{16}H_{23}O_2N$ HCl = 297 74 γ-diethylaminopropylcinnamate hydrochloride, Ph-CH CHCOO$(CH_2)_3NEt_2$ HCl Colorless crystals, m 136, soluble in water or alcohol, used as a local anesthetic

apotoxicarol $C_{18}H_{16}O$ = 248 12 A colorless, phenolic hydrolysis product, m 247, derived from toxicarol

apparatus An instrument or device used for experiments, operations or manufacture, made of glass, metal, wood, etc **laboratory-** Includes glass ware, devices for heating, cooling, shaking and other operations

apple acid Malic acid **a oil** Amyl valerate

appliance A device or apparatus for a special operation or experiment

applicator A device for the local administration of a remedy, *e g* , a radium applicator

approximate Near or approaching, not exact and accurate

apyonin Auramine

apyron Lithium acetyl salicylate

aqua The Latin for water Cf *aquo* Used to denote (1) water, (2) an aqueous solution or infusion, (3) in formulae (+ *aqua*) a variable amount of water, (4) water of crystallization **a ammonia** See *ammonia* water **a anethi** See *dill* water **a anisi** See *anise* water **a carui** See *caraway* water **a chlori** *Chlorine* water **a compound** Hydrate **a destillata** Distilled *water* **a fervens** Hot water **a fluvialis** River water **a fontana** Spring or well water **a fortis** Nitric acid **a laurocerasi** *Cherry-laurel* water **a marina** Sea water **a nivialis** Snow-water **a pluvialis** Rain-water **a pura** Pure water **a regia** Nitro-hydrochloric acid A mixture of 3 pts HCl and 1 pt HNO_3, used as a solvent for noble metals, *e g* , platinum or gold **a tepida** Warm water **a vitae** Brandy or whisky

aquadag A colloidal suspension of graphite in water used as a lubricant

aquamarine A beryl of sea-green color, used as a semi-precious stone

aquation The formation of aquo ions Cf *hydration, solvation*

aquatone A printing process similar to collotype, q v , in which bichromated gelatin coated on thin zinc plates is the sensitive medium

aqueous Watery **a solution** A solution prepared with water as the solvent

aquinite Chloropicrin

aquo Pertaining to water **a ions** A complex ion which contains several molecules of water, as, $[M(H_2O)_8]^{++}$, $[M(H_2O)_6]^{++}$, $[M(H_2O)_4]^{++}$ or $[M(H_2O)_2]^{++}$, where M may be a divalent metal Cf *hydration* **a system** The reactions taking place in water, including the concept of H^+ and OH^- Cf *ammonia system, hydrogen ion, base*

A R Abbreviation for analytical reagent

Ar An alternative symbol for argon, A

ar- A prefix which indicates substitution in the *aromatic* nucleus Cf *ac-*

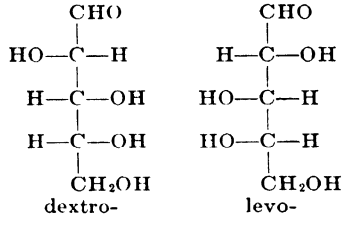
araban $(C_5H_{10}O_5)n$ = 150 11n An arabinose polysaccharide occurring in the mucilage of Malvaceae and in acacia

a-abate A salt of arabic acid

arabic acid $C_5H_{10}O_6 H_2O$ = 184 2 Arabitic acid, d-tetrahydroxyvaleric acid A white amorphous powder precipitated from gum arabic solution by alcohol, soluble in water

arabin $C_{10}H_{18}O_9$ = 282 19 An amorphous powder, soluble in water and insoluble in alcohol, a constituent of gums **a water** A solution of the water-soluble constituents of gums in hydnocarpus oil

arabinose $C_5H_{10}O_5$ = 150 11 Pectin sugar, pectinose, gum sugar The pentoses obtained by hydrolysis of acacia



d- White, rhombic crystals, m 160, soluble in water, alcohol, or glycerol, insoluble in ether It is prepared from arabic acid by boiling with HCl, and is used as a culture medium for certain bacteria

arabinulose $C_5H_{10}O_5$ = 150 11 The keto-pentose corresponding with arabinose

arabite Arabitol

arabitic acid Arabic acid

arabitol $C_5H_{12}O_5$ = 152 13 Arabite The pentatomic alcohol $CH_2OH\ (CHOH)_3\ CH_2OH$ derived from arabinose Colorless, sweet crystals or granules, m 102, soluble in water or alcohol It exists in the d- and l-form, and is found in silage liquor

arabonic acid $C_5H_{16}O_6$ = 166 11 The tetrahydroxy acid, $CH_2OH\ (CHOH)_3\ COOH$, derived from arabinose Colorless crystals, m 89, soluble in water

araceae Aroideae

arachic acid $C_{20}H_{40}O_2$ = 312 42 Arachidic acid, eicosanoic acid*, *n*-eicosoic acid The twentieth member of the fatty acid series, $Me(CH_2)_{18}COOH$ White leaflets, m 77 5, b - 328, insoluble in water, soluble in alcohol or ether It is a constituent of arachis oil, butter and other fats

arachidic acid Arachic acid **a alcohol** Eicosyl alcohol

arachidonic acid $C_{20}H_{32}O_2$ = 304 25 A liquid, unsaturated acid, b 245, occurring in lard and the fat of mammals

arachin A globulin obtained from peanuts, *Arachis hypogaea*

arachis See *peanuts* **a oil** Peanut oil, groundnut oil A fixed oil expressed fractionally from peanuts, $d_{25°}$ 0 913 See *Bellier's test*

arachnolysin A hemolytic principle in the poison of the spider

arack Arrack

araeometer Areometer (see *hydrometer*)

aragonite Pisolite Needle spar A dimorphic, orthorhombic native calcium carbonate, $CaCO_3$ Cf *calcite, nicholsonite*

aralac A fibrous product made from skim milk casein Cf *lanital*

aralia Nard, American spikenard The dried rhizomes and roots of *A racemosa* (Araliaceae) It is used as a fluid extract as an alterative and diaphoretic

Araliaceae The Ginseng family, a group of aromatic plants which yield the following drugs

Panax quinquefolium	ginseng
Aralia nudicaulis	false sarsaparilla
Aralia racemosa	American spikenard
Aralia hispida	dwarf elder
Fatsia Japonica	fatsin

aralin A glucoside from the fresh leaves of *Aralia* species

aralkyl Arylated alkyl A radical in which an aryl group is substituted for a hydrogen atom of an alkyl Cf *alphyl*

aranein A liquid obtained from the abdomen of spiders, used in homeopathic preparations

araphite A magnetic basalt from Colorado

araroba *Goa* powder

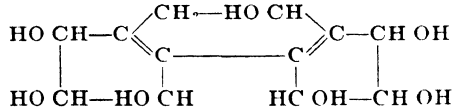
arbacin A protein in the sperm of the sea urchin, (*Arbacia*)

arbor The official Latin for tree **a Dianae** Silver tree The arborescent precipitate o silver formed on adding mercury to a silver salt solution **a Saturni** Lead-tree The arborescent precipitate of lead formed on adding zinc to a lead salt solution **a vitae** Thuja

arborescent A branched, tree-like growth o bacteria or crystals

arbusterol A fat obtained from *Arbutus* species

arbutin $[C_{12}H_{16}O_7]\ H_2O$ = 562 4 Ursin, arbutoside A glucoside from the leaves of *Arbutus* or *Arctostaphylos uva-ursi*, *Chimaphila umbellata* and other Ericaceae and Pyrolaceae, it is hydrolyzed to hydroquinone and glucose



Colorless crystals, m 195, soluble in water alcohol or ether Used as a diuretic and urinary disinfectant **monobenzoyl-** Cellotropin

Arbutus A genus of ericaceous shrubs and trees

A menziesii	madrone
A unedo	European arbutus
A or *Arctostaphylos uva-ursi*	bearberry, arbutin
Epigaea repens	trailing arbutus

arc (1) A portion of any curved line (2) a lamp **electric-** The discharge of an electric current between electrodes **mercury-** An electric discharge through mercury vapor **oscillating-** A discharge which changes its position, *e g*, around the periphery of a disk **voltaic-** The curved flame between two electrodes **a furnace** See *furnace* **a lamp** A source of illumination in which a discharge passes between two electrodes **a spectrum** The spectrum produced by arcing between electrodes of the element under investigation Cf spark *spectrum, alternation* law

arcadian nitrate Sodium nitrate made from synthetic ammonia and soda used as a fertilizer **a sulfate** Ammonium sulfate used as fertilizer

arcaine $C_6H_{16}N_6$ = 172 14 Tetramethylene diguanidine, $NH_2C(NH)NH(CH_2)_4NHC(NH)NH_2$ An animal base from the mussel Noah's Ark (*Areca Noae*), which lowers the sugar content of the blood

arcanite Glaserite

arcanum (1) A nostrum or secret medicine (2) Potassium sulfate

arceine Arecoline hydrobromide

archil Orchil

Archimedes A famous Greek mathematician who lived in the 3rd century B C in Syracuse **A bridge** A wooden platform across the pan of a balance, without touching it, which is used for weighing solids immersed in a liquid **A principle** A body immersed in a liquid will lose weight equal to that of the liquid it displaces It is applied in the determination of the specific gravity of dense, irregular bodies

archon The poisonous radical of proteins

archyl Protyl

arciform Curved or bow-shaped

arcilla Argol

arcing The conversion of electrical energy into light by means of a current flowing in air or a gas between two electrodes It differs from sparking in that it depends on ionization of the vapor of the electrodes, while sparking depends on that of the air or gas between them

arconium A hypothetical element of atomic weight 2 9, similar to *nebulium* and *coronium*, q v

arcual Arc-shaped or arched

ardennite A native manganese and aluminum vanadosilicate, $M_4Al_4H_5VSi_4O_{22}$, which occurs in yellowish or brownish orthorhombic crystals

ardometer An optical *pyrometer*, q v

are (1) Latin for area (2) The unit of surface measurement in the metric system 1 are = 100 m^2 (square-meters) = 119 6 yds^2 (square-yards)

area Any region or surface, S, enclosed by boundaries $S = CL^2$, where C is a constant depending on the contour of the surface (1, if square, $\pi/4$, if round) and L its length (or diameter, if circular)

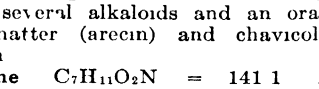
areametric Pertaining to the measurement of areas **a analysis** Chemical analysis by forming precipitates in definite areas, which are matched with precipitates similarly produced from standards

Areca A genus of Asiatic and Australasian palms, as *A catechu pinang*, the areca-nut, betel-nut or catechu palm **a alkaloid** Betel-nut alkaloids

arecoline	$C_8H_{13}O_2N$
homoarecoline	$C_9H_{15}O_2N$
arecaine	$C_7H_{11}O_2N\ H_2O$
arecaidine	$C_7H_{11}O_2N\ H_2O$
guvacine	$C_6H_9O_2N$
guvacoline	$C_7H_{11}O_2N$
conine, coniceine	$C_8H_{17}N$

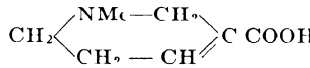
a nut Pinang, betel-nut (q v) The dried seeds of *A catechu*, an East Indian palm It is tonic, astringent and anthelminthic, and contains several alkaloids and an orange coloring matter (arecin) and chavicol **a red** Arecin

arecaidine $C_7H_{11}O_2N$ = 141 1 *N*-Methyltetrahydro-nicotinic acid



An alkaloid formed from arecoline Colorless scales m 223 soluble in water or alcohol insoluble in ether or chloroform Cf *arecoline*

arecaine $C_7H_{11}O_2N$ = 141 1 *N*-Methylguvacine An alkaloid,



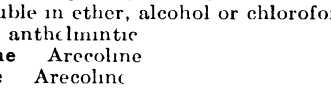
from the seeds of *Areca catechu* (betel nuts) Colorless crystals, m 213, soluble in water and insoluble in ether, alcohol or chloroform Used as an anthelmintic

arecaline Arecoline

arecane Arecoline

arecin $C_{13}H_{26}ON_2$ = 346 3 Areca red A red coloring matter from betel nuts Cf *arecine*

arecoline $C_8H_{13}O_2N$ = 155 1 Arekane, arecaline An alkaloid in betel nuts It is the methyl ester of methyltetrahydro-nicotinic acid (arecaidine) A yellowish oily liquid, d 2 02,



insoluble in water and used as an anthelmintic **homo-** See *homo*

a hydrobromide $C_8H_{13}O_2N\ HBr$ = 236 08 Arceine Colorless prisms, m 167, soluble in water or alcohol, and used as an anthelmintic and miotic **a hydrochloride** $C_8H_{13}O_2N\ HCl$ = 191 5 Colorless crystals, m 158°C, soluble in water or alcohol and used as an anthelmintic and miotic

arecolineserine A mixture of arecoline hydrobromide and eserine sulfate Used for hypodermic injections and in ophthalmology

arekane Arecoline

arendalite A microcrystalline epidote

arenolite An artificial stone

areometer Hydrometer **a scales** See *hydrometer* scales

areometry Hydrometry

arepycnometer A pycnometer for viscous liquids

Arfvedson, Johann August Afzelius 1792–1841 A Swedish chemist and mineralogist, noted for the discovery of lithium (1817)

arfvedsonite A black sodium amphibole containing soda

Argand, Aimé 1755–1803 A Swiss physicist, noted for his design of heating devices **a burner** A gas or oil burner with a chimney and regulated air supply

argatoxyl Silver p-aminophenyl-arsenate, silver atoxylate The compound $C_6H_7O_3NAg$ used medicinally

argein A colloidal silver protein, used to treat gonorrhea

argemonine An alkaloid of prickly poppy (*Argemone mexicana*), probably identical with protopine

argenol Argyrol

argentamine A colorless solution of 8 % silver phosphate and 15 % ethylene-diamine, used as an antiseptic astringent, and disinfectant

argenti The official Latin for "of silver"

argentic A compound containing silver

argentiferous Containing silver **a lead** (1) An alloy of Ag and Pb (2) A lead-silver sulfide

argentiform Silver hexamethylenamine A snow-white powder used as antiseptic

argentine A finely-divided tin sponge obtained by precipitation of a tin salt solution with zinc, used in printing

argentite Ag_2S Silver glance, argyrite vitreous silver ore A native vitreous silver sulfide, occurring in black or grayish isometric crystals Cf *acanthite*

argentol $C_9N\ N\ OH\ SO_3Ag$ = 231 94 Silver quinaseptol, silver oxyquinoline sulfonate An antiseptic and astringent, used for treating venereal diseases

argentometer A hydrometer used for determining the silver content of photographic solutions

argentometry Volumetric analysis involving the use of silver salt solutions and the precipitation of insoluble silver salts, as chlorides, chromates

argentopyrites The native sulfide of silver and iron, $3FeS\ 3FeS_2\ Ag_2S$

argentous A compound containing monovalent silver See *silver*

argentum Latin for silver **a cornu** Horn silver, chlorargyrite, cevargyrite A native form of silver chloride **a virum** Native mercury (Pliny)

argil Argol

argilla Kaolin

argillaceus Containing clay

arginase An enzyme of the mucus (intestine, liver, kidney, spleen) which transforms arginine to ornithine and urea

arginine $C_6H_{14}O_2N_4$ = 174 3 An amino acid from animal and vegetable proteins (albumin and seeds) $NH_2\ CH(COOH)\ CH_2\ CH_2\ CH_2$-$NH\ C\ NH\ NH_2$ Colorless crystals, m 238, soluble in water, and essential in nutrition Cf *arginase, hexone bases, lupine alkaloids*

argochrome A compound of methylene blue and silver, used medicinally as a bactericide

argoflavine The silver salt of acriflavine, used medicinally as a bactericide

argol $KH(C_4H_4O_6)$ Argil, argilla Crude potassium acid tartrate in the form of a fine crystalline crust deposited by grape-juice during fermentation It is exported from Portugal, and used as raw-material for the manufacture of tartaric acid, as a reducing agent, and as a flux in assay processes

argon A = 39 944 A gaseous element, atomic number 18, which occurs in the atmosphere and was discovered in 1894 by Ramsay and Rayleigh **gaseous-** $D_{(air=1)}$ 1 38, m −189, b −186 1 **liquid-** $d_{(-186°C)}$ 1 405 A occurs also in fumaroles and spring water and exists in two isotopic forms, A^{36} and A^{40} It is absolutely inert, so possesses no valency and belongs to the zero-group of the periodic system It is obtained by fractionation of liquid oxygen, and is shipped in steel cylinders Used for filling incandescent lamps, rectifiers, radio audions and vacuum tubes, and as a non-inflammable gas for balloons

argonin Silver caseinate A white amorphous powder, soluble in water Used as an antiseptic in ophthalmology

argyria Poisoning by silver or its compounds

argyrine An alkaloid from horse chestnuts

argyrite Argentite

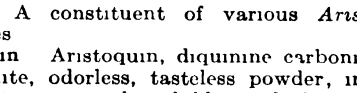
argyrodite A native monoclinic, steel gray germanium silver sulfide, $4Ag\ S\ GeS_2$

argyrol Vitellin silver, argenol A trade brand of silver-protein (20 % Ag) Brownish-black, glistening, hygroscopic scales freely soluble in water or glycerol, insoluble in alcohol or oils Used as an antiseptic in the treatment of inflamed mucous membranes

arheol $C_{15}H_{24}O$ = 220 2 Santalol A sesquiterpene alcohol from the oil of sandalwood A colorless, oily liquid d 0 979, b 300, insoluble in water, soluble in alcohol Used as a urinary antiseptic

arhovin A compound of thymolbenzoic acid ester and diphenylamine used in the treatment of gonorrhea

aribine $C_{12}H_{10}N_2$ = 182 09 Harman loturine An alkaloid from the bark of *Sickingia* (or



Arariba) *rubra*, a Rubiaceae, and the seeds of *Peganum harmala*, a Rutaceae Colorless crystals, m 237

aricine $C_{23}H_{26}O_4N_2$ = 394 22 Cusconine, cinchovatine An alkaloid from the barks of *cusco* and *Cinchona cuprea* Colorless crystals, m 188 insoluble in water, soluble in alcohol or ether, used medicinally as an anti-malarial Cf *arisin*

aristin A constituent of various *Aristolochia* species

aristochin Aristoquin, diquinine carbonic ester A white, odorless, tasteless powder, insoluble in water, sparingly soluble in alcohol or ether, soluble in chloroform

aristol A brand of thymol iodide

Aristolochia A genus of plants of the birthwort family (*Aristolochiaceae*) See *serpentaria, guacine, aristolochine, clematidin* and *asarum* **a yellow** The coloring matter of the roots and seeds of *A* species, *e g*, *A clematitis, A rotunda*

aristolochine $C_{32}H_{29}O_{13}N_2$ = 642 An alkaloid from the roots or seeds of *A* species (*A serpentaria* and *Bragantia wallichii*) It is a kidney poison, abortive and general toxic

aristoquin Aristochin

arithmetical mean Half the sum of two quantities **a progression** A series of numbers in which the differences, d, between consecutive terms are equal Let a be the first and l the last term, d the difference and n the number of terms, then $l = a + (n - 1)d$, while the sum, s, of n terms is $s = n(a + l)/2$

arkansite Brookite

arkite An igneous rock belonging to the leucite-syenite group

arksutite Chiolite

armature The rotating part of a dynamo which consists of the coil and core

armoracia The fresh root of *Cochlearia armoracia*, horse radish, used as a condiment

armored thermometer A thermometer enclosed in a metal case

Armstrong, Henry Edward 1847–1937 An English chemist noted for his research in organic chemistry and work on chemical education **A acid** (1) Same as Schaffer's acid (2) Naphthalene-1 5-disulfonic acid **A metal** An alloy containing Mn 4–6, C 0 10, Ni 80, Cr 17 5, and Cu 2 9 %, used for corrosion-resisting drawn or pressed shapes

arnatto Annatto

Arnaudon's green Chromic phosphate

Arndt tube A bent glass tube with four bulbs used for the determination of hydrogen **A Schulz rule** *Weak* stimuli greatly accelerate life processes, *moderate* stimuli promote them, *strong* stimuli inhibit them and the *strongest* destroy them Cf *Kötschau* hypothesis

Arnica A genus of the composite flowered plants the aster family **a flowers** The dried flower heads of *Arnica montana*, leopard's bane, wolf's bane, or mountain tobacco It is used as a tincture and a fluid extract is a depressant and feeble rubefacient **a oil** An essential oil distilled from arnica flowers A yellow liquid of strong aromatic odor, d 0 906, acid value 75 1, sap v 29 9, soluble in alcohol, ether, benzene, or chloroform Used in liniments **a root** The roots of *Arnica montana* Used as fluid extract **a root oil** Yellow oil from arnica root, d 0 990, $[\alpha]_D$ − 2, its chief constituent is thymoquinol-dimethylester

arnicin $C_{20}H_{30}O_4$ = 334 3 A glucoside from arnica roots and flowers A yellow, bitter, amorphous powder

arnicine $C_{35}H_{54}O_7$ = 586 43 A resinous, basic principle from arnica flowers

arnotta Annatto

arochlors (1) The polychlorine derivatives of biphenyl, used as lubricants (2) The chlorobiphenyl resins, which are odorless and resistant to light and flame

Aroideae Arum family, a group of herbs with an acrid, colorless, juice and fleshy corm or rhizome Their fruit is a berry The following species yield drugs

Acorus calamus (sweet flag)	calamus
Symplocarpus foetidus (skunk cabbage)	symplocarpus
Arisaema triphyllum (Indian turnip)	arum
Colocasia esculenta	taro or poi

aromadendral An aldehydic product from *Eucalyptus* species, a mixture of cuminaldehyde, phellandral and *l*-cryptal

aromatic (1) A spicy, fragrant, agreeable odor or taste (2) A derivative of benzene or a carbon compound whose molecule contains one or more carbon rings **a acids** A group of aromatic organic compounds which contain one or more carboxyl groups

(1) *Monobasic acids*—

benzoic acid	PhCOOH
phenylacetic acid	$PhCH_2COOH$
toluic acids	$C_6H_4Me\ COOH$
β-phenylpropionic acid	$PhCH_2CH_2COOH$
mesitylic, xylic acids	$C_6H_3Me_2\ COOH$
ethylbenzoic acids	$C_6H_4Et\ COOH$
γ-phenylbutyric acid	$PhCH_2CH_2CH_2COOH$
cuminic acids	$C_6H_4Pr\ COOH$
trimethylbenzoic acids	$C_6H_2Me_3\ COOH$

(2) *Dibasic acids*—

phthalic acids	$C_6H_4(COOH)_2$
uvitic, xylidinic acids	$C_6H_3Me(COOH)_2$
cumidinic acid	$C_6H_2Me_2(COOH)_2$

(3) *Polybasic acids*—

trimesinic, trimellitic acids	$C_6H_3(COOH)_3$
pyromellitic, prehnitic acids	$C_6H_2(COOH)_4$
benzenepentacarboxylic acid	$C_6H(COOH)_5$
mellitic acid	$C_6(COOH)_6$

a alcohols A group of aromatic organic compounds which contain an hydroxyl group in a side-chain

C_7H_8O

benzylalcohol, phenylcarbinol	BzOH or $PhCH_2OH$

$C_8H_{10}O$

tolyl alcohol, methylphenylcarbinol	$C_6H_4Me\ CH_2OH$
phenylethylalcohol, benzylcarbinol	$PhCH_2CH_2OH$

$C_9H_{12}O$

xylylalcohol, dimethylphenylcarbinol	$C_6H_3Me_2\ CH_2OH$
phenylpropylalcohol	$PhCH_2CH_2CH_2OH$
tolylcarbinol	$C_2H_4Me\ CH_2CH_2OH$

$C_{10}H_{14}O$

pseudocumene alcohol trimethylphenylcarbinol	$C_6H_2Me_3\ CH_2OH$
xylylcarbinol	$C_6H_3Me_2\ CH_2CH\ OH$
cumenealcohol, propylphenylcarbinol	$C_6H_4Pr\ CH_2OH$
unsaturated alcohols cinnamyl alcohol	$Ph\ CH\ CH\ CH_2OH$
diatomic alcohols xylylenalcohols phenylendicarbinols	$C_6H_4(CH_2OH)_2$

$C_{11}H_{16}O$

mellityl alcohol	$C_6HMe_4\ CH_2OH$

a compound A organic compound containing a closed and saturated ring, either homocyclic or heterocyclic See *organic* compounds and *aromatic* **a hydrocarbon** A compound of carbon and hydrogen that contains in its molecular structure a closed and saturated ring of carbon atoms, *e g*, benzene, naphthalene, anthracene etc **a series** A series of aromatic compounds **a tincture** An alcoholic solution of cinnamon, ginger, cardamon, cloves and galangal, used as an aromatic and carminative **a vinegar** A refreshing smelling mixture of acetic acid and essential oils, used to relieve headache

aromatics Spicy, fragrant, and stimulating drugs, with agreeable taste which is usually due to a small amount of an essential oil

aromatin A substitute for hops, prepared from gentian root

Arons chromoscope An instrument for measuring colors of industrial products (*e g*, paper, leather, yarns, textiles), and for physiological work

aroxylamines α-Hydroxylamines

aroyl. A radical of the type R.CO—, where R is an aromatic radical (benzoyl, naphthoyl).

arphoalin. An albumin preparation containing arsenic and phosphorus.

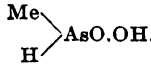
arquerite. A native silver amalgam, $Ag_{12}Hg$, from Arqueros, Chile, which occurs in isomeric crystals.

arrack. A liquor distilled from malted rice.

arrhenal. *Sodium* methylarsenite.

arrhenate. A salt of arrhenic acid of the type MeHAsO.OM; used in medicine instead of *cacodylates.*

arrhenic acid. CH_5O_2As = 123.98. Monomethylarsenic acid. The compound



Used in organic synthesis and in the manufacture of arrhenates. *Cf. cacodylic acid.*

Arrhenius, Svante August. 1859–1927. A Swedish chemist and physicist noted for developing the theory of ions and ionization (1883) and for cosmic theories. **A. law.** A solution of high osmotic pressure conducts an electric current. **A. theory.** When an electrolyte dissolves it

Svante August Arrhenius.

(From McPherson & Henderson's "First Course in Chemistry." Courtesy of Ginn & Company.)

splits up into ions (ionization) to an extent which increases with a decrease in the concentration, and is indicated by the deviation of the solution from the Van't Hoff laws. The degree of ionisation (q.v.) can be calculated from conductivity measurements. **A. viscosity formula.** The relationship of the viscosity, x, of a solution to the volume c of the suspended particles present is $\log x = \theta c$, where θ is a constant.

arrow-poison. A poisonous plant juice (*e.g.* curare, q.v.) or venom of an animal (*e.g.*, snake, etc.) used by native tribes or primitive hunters in poisoning arrow-heads. See *acocantherin, antiar, batracin bufagin, calotropin, derrid, ipoh, guachamacine, nicoulin, upas, wagofo, muava, ibogaine.*

arrow-wood. (1) Frangula. (2) Euonymus.

arrowroot. Maranta. The starch from the rhizomes of the arrowroot plant, *Maranta arundinaceae,* Family Marantaceae. A light white powder which is used as a non-irritating food in fever, commercially as an adhesive, and in laundries. It is exported from Bermuda. **Bahia-, Para-, Rio-.** Tapioca.

arsabenzol. Arsphenamine.

arsacetin. Acetylatoxyl, sodium p-acetylaminophenylarsonate. Colorless crystals used as a syphilitic.

arsamin. Atoxyl.

arsaminol. A Japanese brand of arsphenamine.

arsan. Arsenglidin. A yellowish-gray powder; insoluble in water, soluble in alkalis.

arsanilate. Atoxylate. A salt of arsanilic acid of the type $M_2(C_6H_8O_3NAs)$.

arsanilic acid. $C_6H_8O_3NAs$ = 217.2. Atoxylic acid, p-aminobenzenearsonic acid, *p*-aminophenylarsinic acid. $NH_2.C_6H_4.AsO(OH)_2$, arsenic acid anilide, meta-arsenous acid anilide. Colorless crystals, m.232; soluble in ether, amyl alcohol, or alkalis; slightly soluble in alcohol. Used in organic synthesis. The **m-** and **o-**acids are also known. **acetyl hydroxy-** Stovarsol. *N*-**carbamyl-** Carbarsone. *N*-**carbamylmethyl-** Its sodium salt is tryparsamide (q.v.).

Arsem furnace. An electric vacuum furnace.

arsenate. A salt of arsenic acid containing the trivalent $AsO_4 \equiv$ radical; as, Na_3AsO_4. **acid-** An a. containing hydrogen, as the monoacid or diacid arsenate. **basic-** An a. containing a metal oxide or hydroxide. **diacid-** A salt containing the monovalent radical H_2AsO_4—. **dihydric-** Diacid a. **meta-** An a. containing the AsO_3^- radical. **monoacid-** A salt containing the divalent radical, $HAsO_4=$. **monohydric-** Monoacid a. **pyro-** An a. derived from $H_4As_2O_7$. **triethyl-** $C_6H_{15}AsO_4$ = 226.08. The compound $(EtO)_3.AsO$. A colorless liquid, d.1.326, b.238.

arsenglidin. Arsan.

arsenhemol. A compound of arsenic and hemol which occurs as a brown, amorphous powder; used medicinally as an alterative and hematinic.

arsenic. As = 74.91. An element of the phosphorus group, atomic number 33. A rhombohedric, grayish-black brittle, nonmetal of metallic character, $d_{14°}$.5.727, m. (under pressure) 450 (sublimes), b.450; insoluble in water, alcohol or acids. It is found native as the sulfide, arsenide, and sulfarsenides of the heavy metals and is widely diffused through nature, even in organic matter. Arsenic occurs in a number of allotropic modifications analogous to those of phosphorus:

(a) Metallic arsenic, γ-As, d.5.727. The stable ordinary form.

(b) Gray or black arsenic, β-As, d.4.64, which changes at 303 to γ-As.

(c) Yellow arsenic, α-As_4, d.3.7, which represents the non-metallic form of arsenic and is formed at 500 by rapid condensation of arsenic vapor. It is soluble in carbon disulfide, resembles phosphorus, is photo-sensitive, and unstable, and changes to gray arsenic on exposure to light.

(d) Brown arsenic, As_8, d.2.03, an allotropic form of the non-metallic arsenic deposited from yellow arsenic solutions; it changes at 180 to gray arsenic. Arsenic may be tri- and pentavalent, and gives three series of compounds:

Derived from trivalent, negative As:

arsenides	M_3As
arsines	AsR_3
arsonium	AsH_4R

Derived from trivalent, positive As

arsenous	As^{+++}
arsenite	AsO_2^- or AsO_3^{---}
arsinic acid	R_2AsO_2

Derived from pentavalent, positive As

arsenic	As^{+++++}
arsenate	AsO_3^- or AsO_4^{---}
arsonic acid	$RAsO_3$

Orpiment or arsenic sulfide was known to the ancients Theophrastus mentions it as arsenicon, meaning the "masculine one," as it was used to paint the sunburnt faces of men Arsenic is used in medicine, especially in the form of cacodylates, and arsenic compounds are employed as germicides, insecticides, for certain pigments, and the preparation of arsenic salts **butter of-** Arsenous chloride **dimethyl-** Cacodyl **flowers of-** Arsenous oxide **red-, ruby-** Realgar **triethyl-** Triethyl*arsine* **white-** Arsenolite, arsenite A native arsenous oxide **yellow-** Is orpiment

a acid (1) ortho- $H_3AsO_4\ \frac{1}{2}H_2O$ = 151 0 Colorless crystals, d 2 0–2 5, m 35 5, soluble in water, used in the manufacture of arsenates (2) meta- $HAsO_3$ = 124 0 A white powder soluble in water with the formation of ortho- a acid (3) pyro- $H_4As_2O_7$ = 264 89 A colorless powder, decomp 208, and soluble in water, forming ortho- a acid **a apparatus** See *Marsh* test **a bromide** Arsenous bromide **a butter** Arsenous chloride **a chloride** Arsenous chloride **a diethyl** $AsEt_2$ = 133 06 A heavy liquid b 186, insoluble in water, soluble in alcohol or ether **a diiodide** AsI_2 = 328 80 White crystals, decomp 136 **a dimethyl** $AsMe_2$ = 105 02 A colorless liquid, d 1 15, b 150, insoluble in water, soluble in alcohol or ether **a disulfide** As_2S_2 = 214 1 Realgar, red a sulfide, red orpiment, a ruby, red a glass, A brownish-red powder or monoclinic crystals, d 3 55, m 307, b 565, insoluble in water, soluble in alkalis, alkali-carbonates and sulfides Used as a pigment, in textile printing, in pyrotechnics, in tanneries and in the manufacture of shots **a fluoride** AsF_5 = 169 96 A colorless, poisonous gas, d (H_{2-1}) 5 964, m –80, b –53, soluble in water **a glass** (1) An indefinite term for a compounds, *e g*, a sulfides (2) Arsenous oxide **a hydride** (1) Arsenous hydride (2) An ill-defined solid hydride, As_4H_2, AsH_2 or (AsH)x, formed from water and sodium arsenide **a iodide** (1) a diiodide (2) arsenous iodide **a minerals** Arsenic is usually associated with antimony and bismuth minerals and occurs in many sulfide minerals, *e g*,

native arsenic	As
realgar	As_2S_2
orpiment	As_2S_3
allemontite	$SbAs_3$
arsenolite, arsenite	As_2O_3

also the arsenides and sulfoarsenides of the heavy metals

a oxide (1) As_2O_5 = 229 9 A pentoxide, a acid anhydride A colorless amorphous powder, d 4 086, decomp on heating, and soluble in water or alcohol (2) See *arsenous* oxide **a oxychloride** See *arsenous* oxychloride **a pentafluoride** a fluoride **a pentasulfide** a sulfide **a pentoxide** a oxide **a phosphide** Arsenous phosphide **a ruby** a disulfide **a selenide** Arsenous selenide **a sulfide** (1) As_2S_5 = 310 4 A pentasulfide Yellow crystals, insoluble in water used as a pigment (2) See a disulfide (3) Arsenous sulfide **a thiocyanate** $As(SCN)_3$ = 249 0 **a tribromide** Arsenous bromide **a trichloride** Arsenous chloride **a trifluoride** Arsenous fluoride **a triethide** Triethyl-*arsine* **a triiodide** Arsenous iodide **a trimethyl** Trimethyl-*arsine* **a trioxide** Arsenous oxide **a trisulfide** Arsenous sulfide

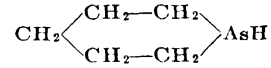
arsenical Pertaining to As **a nickel** Niccolite **a pyrites** Mispickel

arsenicals A group of drugs, fungicides, or insecticides whose effects depend on their arsenic content, *e g*, cacodylates, salvarsan, paris green

arsenicum Latin for arsenic

arsenide A binary compound of arsenic, in which As is the negative element, As^{---}, *e g*, H_3As, Ag_3As, Zn_3As_2 Cf *speise*

arsenidine $C_5H_{11}As$ = 146 0 Arsepidine The heterocyclic compound and analog of piperidine



arsenii The official Latin for arsenic

arsenious Arsenous

arsenite (1) A salt of an arsenous acid

ortho-arsenites	K_3AsO_3
meta-arsenites	$KAsO_2$
pyro-arsenites	$Ca_2As_2O_5$

The acids from which these are derived are hypothetical (2) White *arsenic* **triethyl-** $C_6H_{15}AsO_3$ = 210 08 $(EtO)_3As$ A colorless liquid, d 1 224, b 166

arsenium The element, arsenic

arseniuretted hydrogen Arsine

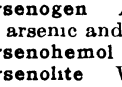
arsenius See *arsenous*

arseno The bivalent group—As As—which is isologous with the azo group

arsenobenzene PhAs AsPh An analog of azobenzene

arsenobenzol A French brand of arsphenamine

arsenoferratin An iron albuminate containing arsenic

arsenofuran C_4H_5As Arsenophen An analog of pyrrole, 

arsenogen A compound of iron, phosphorus, arsenic and paranucleic acid

arsenohemol Arsenhemol

arsenolite White arsenic

arsenophen. Arsenofuran

arsenophenol $C_{12}H_{10}O_2As_2$ = 336 00 Dihydroxyarsenobenzene, HO C_6H_4 As As C_6H_4 OH **diamino-** Arsphenamine

arsenopyrite FeAsS Mispickel A native iron sulfarsenide

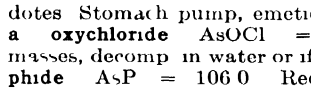
arsenous A compound of trivalent arsenic, As≡ **a acid** H_3AsO_3 or $HAsO_2$ A monobasic acid, from which the arsenites are derived See *arsenites* Ordinarily the name applies to arsenous oxide, As_2O_3 **a acid anhydride** a oxide **a bromide** $AsBr_3$ = 314 72 Arsenic tribromide Yellowish-white crystals, d 3 66, m 31, b 220, soluble in water Used in diabetes

and as a reagent in analytical chemistry **a chloride** $AsCl_3$ = 181 3 Arsenic trichloride, arsenic butter Yellowish liquid or needles, d 2 205, m −18, b 130 2, soluble in water, alcohol, ether, or oils **a fluoride** AsF_3 = 131 96 A pale yellow liquid, d 2 73, m −8 5, b 63, decomp by water, and soluble in alcohol or ether **a hydride** AsH_3 = 78 0 Arsine Hydrogen arsenide A poisonous gas with strong garlic odor $d_{(air=1)}$ 2 695, m −113 5, b −54 8, soluble in water or alkalis It is shipped in steel cylinders and used in organic synthesis and in chemical warfare **a iodide** AsI_3 = 455 72 Arsenic triiodide Arsenic iodide Orange-red crystalline masses, d 4 39, m 146, (sublimes), b circ 400, soluble in water and used as an antiseptic, externally in skin diseases or internally as a constituent of Donovan's solution **a oxide** As_4O_6 or As_2O_3 = 197 9 Arsenic trioxide, 'arsenic,' arsenous acid anhydride, white arsenic White octahedral or rhombic crystals (d 3 7 and 3 79 respectively), or white, amorphous, glassy masses, d 3 65–4 15, subliming at 218, slightly soluble in water, and soluble in alkalis or acids Used medicinally as an antiperiodic, alterant or antiseptic, and in the glass, leather, and pigment industries, also as an antiseptic and preservative of dead animals, poison for noxious animals and plants, in the manufacture of shots and arsenic salts Antidotes Stomach pump, emetics, iron hydroxide **a oxychloride** AsOCl = 126 42 Brown masses, decomp in water or if heated **a phosphide** AsP = 106 0 Reddish-brown fragments which are soluble in carbon disulfide, and are decomp by water or by heat **a selenide** As_2Se_3 = 386 52 Arsenic triselenide Brown crystals, d 4 75, m 360, insoluble in water, soluble in alkalis **a sulfide** As_2S_3 = 246 1 Arsenic trisulfide, yellow arsenic sulfide orpiment, auripigment, king's yellow Yellowish-red monoclinic crystals or a yellow amorphous powder, d 3 46, m 310, b 700, insoluble in water and soluble in alkalis or acids Used as a pigment

arsenyl Sodium methylarsenate

arsepidine Arsenidine

arsindole C_8H_7As = 178 02 The heterocyclic compound



arsine (1) AsH_3 = 78 0 See *arsenous* hydride, *arsyl* and *arsylene* (2) See *arsines* **alk-** Me_2As O $AsMe_2$ Cacodylic oxide A colorless liquid, d 1 462, m −25, b 120 See also *alkarsine* **diethyl-** (1) Et_2AsH or $C_4H_{11}As$ = 134 05 (2) Tetraethylarsine **dimethyl-** Me_2AsH = 106 07 Cacodylhydride A colorless liquid, d 1 213, b 36, miscible with alcohol, ether or chloroform **diphenylene-** Dibenzoarsenole **ethyl-** C_2H_5As = 105 98 Arsinoethane, $EtAsH_2$, a colorless liquid, d 1 217, b 36 **methyl-** CH_5As = 91 97 Arsinomethane, $MeAsH_2$ A colorless liquid or gas, b 2, soluble in alcohol **methyldichloro-** CH_3Cl_2As = 160 87 Methylarsenic dichloride, $MeAsCl_2$ A colorless liquid, d 1 838, m −59, b 133 **mono-R-** A compound of the type $RAsH_2$ **tetraethyl-** Et_2As $AsEt_2$ Ethylcacodyl A colorless liquid, b 188 **tetramethyl-** Cacodyl **tri-R-** A compound of the type R_3As **triethyl-** $C_6H_{15}As$ = 162 08 Arsenic triethyl, $AsEt_3$ A colorless liquid d 1 150, decomp 141 **trimethyl-** C_3H_9As = 120 03 Arsenic trimethyl, arsenous methide, $AsMe_3$ A colorless liquid, d 1 124, b 52 8, soluble in water

arsines Derivatives of arsine in which the hydrogen is replaced by a hydrocarbon radical, as

$RAsH_2$	mono-alkyl arsine
R_2AsH	dialkyl arsine
R_3As	trialkyl arsine

They are analogs of amines, phosphines, stibines

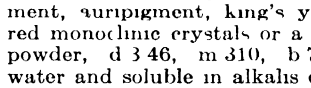
arsinic acid (1) An organic compound derived from trivalent arsenic of the type

$RAsO_2H_2$	monoaryl or monoalkyl a acid
R_2AsO_2H	diaryl or dialkyl a acid
R_3AsO_2	triaryl or trialkly a acid

(2) In British terminology an "arsinic" acid, as well as an "arsonic" acid of the American terminology **aminophenyl-** Arsanilic acid **dimethyl-** Cacodylic acid **methyl-** Methanearsonic acid

arsino- (1) A prefix indicating the presence of the divalent —As As— group (2) The divalent radical (OH)OAs =, derived from arsinic acid **a salicylic acid** Colorless crystals used in the same way as atoxyl

arsinoline C_9H_7As = 190 1 The heterocyclic compound



arsinoso The monovalent radical O As—, isologous with nitroso

arsonate A salt of arsonic acid containing the $RAsO_2$—radical

arsonic acid An organic compound derived from pentavalent arsenic of the type

$RAsO(OH)_2$	monoaryl or monoalkyl a acid
$R_2AsO_2(OH)$	diaryl or dialkyl a acid
R_3AsO_3	triaryl or trialkyl a acid

***p*-carbaminophenyl-** Carbasone **phenyl-** Benzenearsonic acid

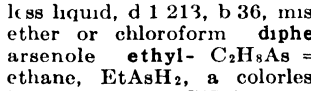
arsonium The univalent radical, AsH_4—, an isolog of ammonium and phosphonium **a compounds** A group of addition compounds derived from arsine, they are of the general type, AsH_3 HX, or AsH_4X **a hydroxide** AsH_4OH An isolog of ammonium hydroxide and parent substance of a number of organic derivatives, *e g* ,

R_4AsOH	tetra-R-arsonium hydroxide

arsono The monovalent radical $(HO)_2OAs$—, derived from arsonic acid

Arsonval, A d' (1851–) A French physicist a pioneer in the application of high-frequency, interrupted electric currents for therapeutic purposes

arsphenamine $C_{12}H_{12}O_2N_2As_2$ 2HCl = 437 2 Salvarsan, diarsenol, arsphenolamine hydrochloride, arsaminol, arsenobenzol, 3-diamino-4-dihydroxyl-arsenobenzene, kharsivan, Ehrlich 606, six hundred six, six-o-six, S O S



A yellow, hygroscopic, crystalline powder, unstable in air and soluble in water with acid reaction, used as a specific in syphilis and relapsing fever **neo-** *Neo*arsphenamine

arsycodile Sodium cacodylate
arsyl The monovalent radical, H_2As—, derived from arsine
arsylene The divalent radical, HAs=, derived from arsine
arsynal Sodium methyl arsenite
artabotrine $C_{36}H_{55}O_6N$ = 597 42 An alkaloid, m 187, from the stems and roots of *Artabotrys suaveolens*, an Anonaceae
artarine $C_{21}H_{23}O_4N$ = 353 2 An alkaloid from artar root It is a heart stimulant similar to veratrine
artar root A drug from West Africa, probably the root of *Zanthoxylum senegalense*, a Rutaceae
Artemisia A genus of plants belonging to the aster family (*Compositae*)

A abrotanum	Southern wood
A absinthium	worm wood
A frigida	wild sage
A maritima	worm seed, santonica
A pontica	Roman worm wood
A tridentata	sage brush
A vulgaris	mug wort

a oil Wormwood oil
artemisin $C_{15}H_{18}O_4$ = 262 2 Oxysantonin A constituent of the seeds of *Artemisia* species White crystals, m 200, soluble in hot water, hot alcohol or chloroform, used as a gastric stimulant
arterin A red blood pigment of arterial blood Cf *oxyhemoglobin*
arteriograph An instrument for tracing and recording the pulse
arteriosclerosis An abnormal hardening of the walls of the arteries
artery Arteries The blood vessels in which the blood passes from the heart to the organs of the body, as opposed to veins
arthranitin $C_{20}H_{34}O_{10}$ = 434 3 Cyclamin A glucoside from arthanite (*Cyclamen europaeum*) A white, amorphous powder, soluble in water, it splits into glucose and cyclamiretin on boiling A purgative and emetic
arthriticin (1) $(C_2H_5O)C_6H_4N(CH_3)NHCH_2$-$CONH_2$ A disinfectant used in arthritis (2) Piperazine
arthropods A group of invertebrate animals with jointed limbs, *e g*, the spiders and crustaceans
artiad (obsolete) An element having an even valency, *e g*, a diad, tetrad, hexad
artic Trade name for methylchloride used in refrigerators
artificial Made by man as opposed to natural, as artificial indigo or camphor Cf *synthetic*
artolinantipeptone Artose
artose $C_{18}H_{288}O_{58}N_{50}S$ = 4036 5 A water-soluble albumose produced by digestion of gliadin from wheat Cf *deutero*artrose, *hetero*-artrose
artotype Collotype
aruba acid A naphthenic acid extracted from Columbian gas oil by alkali, d 0 961, acid val 202
arum (1) A genus of plants (Aroidae) whose corms yield starchy products, *e g*, sago from *A maculatum* (2) A starch similar to sago from *A maculatum* (Southern Europe), used as food
aryl A organic radical derived from an aromatic hydrocarbon by the removal of one hydrogen atom, *e g*, phenyl from benzene, tolyl from toluene, salicyl from salicylic acid Cf *alkyl*
arylarsonate A compound of arsenic containing aryl radicals, *e g*, salvarsan, arsphenamin, atoxyl
aryle, arylide A compound of a metal containing an aryl radical, as, PbR_4, HgR_2, etc
arznei The German term for drugs
as- Abbreviation for asymmetric
As The symbol for arsenic
asafetida Asafoetida A gum resin obtained by incising the roots or rhizomes of *Ferula asafetida* and other *Ferula* species (Umbelliferae) A soft mass of garlic-like odor, acrid, bitter taste, emulsifies with water, slightly soluble in alcohol It is a carminative and sedative, and is used as fluid extract, and a tincture Cf *ferulic* acid **milk of-** See *milk*
a oil A light yellow, volatile oil distilled from asafetida, d 0 975–0 990, $[\alpha]_D$ + 13° – + 19, soluble in alcohol, ether, chloroform or benzene
asalob A beverage produced in Sudan by the fermentation of honey, containing about 9 % of alcohol
asaprol Abrastol
asarin Asarone
asarite Crude asarone
asarol $C_{10}H_{14}O$ = 154 2 An alcohol from *Asarum* species
asarone $C_{12}H_{16}O_3$ = 208 1 Asarum camphor, asarin, propenyl-2 4 5-trimethoxy benzene, $(MeO)_3C_6H_2CH{:}CHMe$ A constituent of the roots of *A europœum* Colorless crystals, m 67, b 296, soluble in alcohol or ether A tonic and antiseptic Cf *calamus* oil
asaronic acid $C_{10}H_{12}O_5$ = 212 09 *2 4 5*-Trimethoxybenzoic acid $(MeO)_3C_6H_2COOH$ Colorless crystals, m 144, b 300
Asarum (1) A genus of plants of the birthwort family (Aristolochiaceae) (2) Canada snakeroot, wild ginger The dried rhizomes and roots of *A canadense* It is a carminative and flavoring agent and is used as the fluid extract **a camphor** Asarone **a oil** An essential oil from asarum species *Canadian-* From the roots of *A canadense* A colorless liquid, d 0 930–0 960, $[\alpha]_D$ – 3 5, soluble in alcohol, ether, chloroform or benzene The chief constituents are asarol and methyleugenol used in perfumery *European-* From the roots of *A europaeum*, d 1 015–1 068, soluble in alcohol, ether or benzene
asaryl The monovalent radical, $(MeO)_3C_6H_2$—, derived from asarone
asbestos Amianthus, earth-flax, mountain cork, stone flax A fibrous form of actinolite, a native, fibrous, magnesium, calcium silicate which occurs in white, grayish or greenish masses either compact or as long, silky, flax-like readily-separated fibers It is acid- and heat-resisting, and may be spun or woven, used for Gooch filters, fireproof objects (clothing, curtains, packings, etc) See also *crocidolite*, *chrysotile*, *hornblende* **blue-** Abriachanite **Canadian-** Chrysotile
a board Sheets of asbestos fibers, pressed to various thicknesses, used for fireproofing or insulating apparatus, to protect wood work and table tops **a cord** A string made of asbestos, to support crucibles or retorts **a filter** A Gooch crucible with a fibers in its bottom, through which precipitates are filtered in analytical work **a gloves** Asbestos gloves,

to protect the hands of workers from burns **a magnesia mixture** A mixture of a and magnesia used for steam packings **a sponge** a impregnated with platinum salt solution and ignited, used as a catalyzer **a stopper-** A stopper made from asbestos magnesia mixture, used for high temperatures and corrosive chemicals

asbolane Asbolite

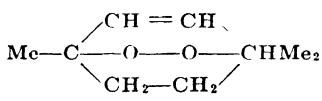
asbolin A yellow oil from the distillation of pine roots, which contains pyrocatechin, used in tuberculosis

asbolite Asbolane, earthy cobalt An earthy psilomelane or wad (q v) containing cobalt oxide

ascaricide A drug which destroys *Ascaris* parasites (intestinal worms)

ascaridic acid Ascaridolic acid

ascaridol $C_{10}H_{16}O_2$ = 168 1 A terpene peroxide and the active constituent of chenopodium oil



An explosive liquid, $d_{21°}$ 0 9985, b $_{8mm}$97 **a glycol** $C_{10}H_{18}O_3$ = 186 1 Colorless crystals, m 63, b 272

ascaridolic acid $C_{10}H_{16}O_5$ = 216 2 Cineolic acid, ascaridic acid The oxidation product of ascaridol glycol, m 187 It exists in *d-* and *l-* forms, m 130, and as *dl-*, m 117

Ascaris A genus of round worms, some of which are intestinal parasites

ascarite A solid absorbent for CO_2 made from NaOH and asbestos It changes from white to gray thus indicating the need for recharging or regenerating the absorption tube

ascaryl alcohol $C_{33}H_{68}O_4$ = 528 48 A dihydric alcohol, m 84, from the fat of *Ascaris* species

ascharite $3Mg_2B_2O_5\,H_2O$ A native magnesium borate, found in saline deposits (*e g*, at Stassfurt)

aschistic process A process in which work is converted directly into heat

Asclepiadaceae The milk-weed family A group of herbs usually with a milky juice which contains caoutchouc

Asclepias tuberosa	asclepias root
Asclepias cornuti	common silkweed
Asclepias incarnata	swamp milkweed
Asclepias curassavica	blood flower
Calotropis species	calotropin, mudaric acid, akundarol
Hemidesmus indicus	Indian sarsaparilla
Gonolobus condurango	condurango bark
Periploca graeca	periplocin
Tylophora astamatica	tylophorine

asclepiadin A bitter principle of asclepias

asclepias Pleurisy root The dried roots of *A tuberosa* (Asclepiadaceae) It is a diaphoretic, diuretic, expectorant and tonic and is used as a fluid extract

asclepidin A concentration of asclepias principles, used medicinally

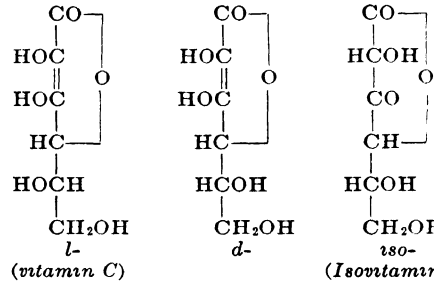
asclepidoid The combined principles of asclepias

asclepin A resinoid from asclepias, used medicinally as a cathartic and diaphoretic

asclepion $C_{20}H_{34}O_3$ = 322 3 A camphor-like principle of *A syriaca*

Ascomycetes A group of fungi (molds) *e g*, Aspergillus, Penicillium, etc

ascorbic acid $C_6H_8O_6$ = 176 05 Cevitamic acid, hexuronic acid, *3*-keto-*l*-gulonolactone, antiscorbutin, vitamin C, antiscorbutic principle The *l-* form of the δ-lactone of *2 4 5 6* tetrahydroxy-*3*-ketohexanoic acid **d-** Has no vitamin effect **iso-** Isovitamin C Has a weak vitamin effect



l- (*vitamin C*) *d-* *iso-* (*Isovitamin C*)

-ase A suffix indicating, (1) an enzyme, or non-organized ferment, *e g*, diastase This termination is at present restricted generally to enzymes of vegetable origin, but it should also be used for animal enzymes—which, however, usually end in "in", thus pepsase and trypsase, rather than pepsin and trypsin, (2) certain ores, *e g*, orthoclase

asebotin A glucoside from the leaves of mountain laurel (*Kalmia latifolia*)

asebotoxin A glucoside from *Andromeda japonica*, an Ericaceae

asellin $C_{25}H_{32}N_4$ = 388 5 An alkaloid from cod liver oil

asepsin Bromoacetanilide

asepsis Absence of or freedom from infection

aseptic technic The methods used to prevent infection, *e g*, sterilizing, disinfecting etc

aseptol $C_6H_4\,OH\,HSO_3$ = 174 o-phenol sulfonic acid, sulfophenol, sozolic acid, o-sulfocarbolic acid A reddish oil, used as 33 % solution, d 1 55, soluble in water or alcohol Used as an antiseptic or disinfectant, and a reagent for albumin, bile pigments, nitrites and nitrates

aseptoline Pilocarpine

asexual Without sex, as the lower forms of plants and animals

asferryl Iron arsenotartrate A greenish-yellow powder, used in the treatment of anemia and chlorosis

ash (1) The mineral matter or incombustible residue remaining after a substance has been incinerated (2) See *Fraxinus* **caustic-** Sodium carbonate **causticized-** A mixture of Na_2CO_3 and NaOH **poison-** Ischionanthus **pot-** Potash **prickly-** Xanthoxylum **soda-** Commercial sodium carbonate

Ashcroft paper tester A device to determine the bursting strength of paper

ashing The process of burning organic matter, especially in analysis

ashphalt Asphalt

asimmine An alkaloid from the seeds of papaw, *Asimina triloba*, an Anonaceae It is a narcotic

asiphyl Mercuric atoxylate

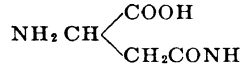
asonidin Plumierin

asparacemic acid *dl* Aspartic acid

asparagic acid Aspartic acid

asparagine $C_4H_8O_3N_2\,H_2O$ = 150 10 Aspargine, asparamide, agedoite, altheine, aminosuc-

cinic acidamide, α-amino-succinamic acid, aspartamic acid



An alkaloid found in the sprouts of dicotyledons and in many seeds White rhombic crystals, d 1 543, m 230, soluble in hot water, insoluble in alcohol or ether It is a constituent of many proteins, and an isomer of malamide **a hydrargyrate** A mercury compound of asparagine, which is used as a diuretic in syphilis **a sulfate** $C_4H_8O_3N_2 \cdot H_2SO_4$ = 230 1 A white powder, soluble in water

asparaginic acid Aspartic acid

asparagus The root of *Asparagus officinalis* a Liliaceae It is used as fluid extract as an aperient and diuretic Cf *asparol chrysoidin*

asparagyl The monovalent radical, $NH_2CO \cdot CH_2CHNH_2CO$—, derived from asparagine

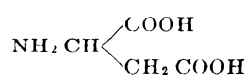
asparamide Asparagine

aspargine Asparagine

asparol A fluid extract from *Asparagus officinalis*

aspartamic acid Asparagine

aspartic acid $C_4H_7O_4N$ = 133 09 Aminosuc-



cinic acid, asparaginic acid, asparagic acid **dl-** Asparacemic acid White monoclinic prisms, d 1 663, m 278 **d-** Colorless leaflets m 251 **l-** Rhombic leaflets, d 1 661, m 270, slightly soluble in water, insoluble in alcohol, or ether, used in organic synthesis

aspartyl The divalent radical, —$CO \cdot CH_2 \cdot CH(NH_2)CO$—, derived from aspartic acid

aspasiolite A partly decomposed iolite

aspergillin Vegetable hematin The black coloring matter of the spores of various *Aspergillus* species (molds)

Aspergillus A genus of molds, many of which are parasitic Cf *mycogalactan, tane-koji*

asphalt Jews' pitch, petrolene, mineral pitch, earth pitch, Trinidad pitch, petroleum pitch A native mixture of hydrocarbons which occurs as amorphous, solid or semi-solid, brownish-black pitch or bitumen, produced from the higher boiling-point mineral oils by the action of oxygen They are divided into *asphaltenes* and *carbenes*, q v Used for pavements roofing and waterproofing materials Cf *parinite* **a base** See *petroleum* **a sludge** A non-conducting sludge found in electrical transformers It consists mainly of oxygenated bodies of high molecular weight **a stone** Natural a A limestone naturally impregnated with bitumen **a testing apparatus** See *penetrometer, viscosimeter adhesive* meter **a thermometer** An armored thermometer graduated from 200° to 450°F

asphaltenes That portion of asphalt or bitumen which is soluble in CS_2 but insoluble in paraffin oils or in ether Cf *carbenes, kerotenes*

asphaltic bitumen A more accurate term for *asphalt*

asphyxia The suffocation caused by a deficiency of oxygen for respiration

aspidin $C_{23}H_{32}O_7$ = 420 3 A poisonous constituent of male fern, *Aspidium*

aspidinol $C_{12}H_{16}O_4$ = 224 2 An alcohol, m 161, obtained from aspidium

Aspidium (1) A genus of ferns *Filices* (2) Male fern, the dried rhizome of *A filix-mas*, a Poldiaceae Used poymedicinally, as the fluid extract or oleoresin, as an anthelminthic and teniacide It contains filicic acid filmaron, aspidin, albopannin, flavaspidic acid, etc Cf *pannol, filix, fustin*

aspidosamine $C_{22}H_{28}O_2N_2$ = 352 4 An alkaloid from quebracho bark A brownish powder, m 100, soluble in alcohol, ether, chloroform or benzene Used medicinally as an emetic **a hydrochloride** $C_{22}H_{28}O_2N_2 \cdot HCl$ = 387 8 A brown powder, soluble in water, alcohol or ether, used as an emetic

aspidosperma Quebracho The bark of *Aspidosperma quebracho* (Apocynaceae) a South American tree It contains aspidospermine aspidosamine quebrachine and other alkaloids, and is used medicinally as an antiperiodic and respiratory tonic

aspidospermine $C_{22}H_{30}O_2N_2$ = 354 26 (1) An alkaloid from the bark of *Aspidosperma quebracho* White needles or prisms m 206, soluble in alcohol, ether or chloroform Used in the treatment of dyspnea asthma (2) An amorphous brownish-yellow powder, which consists of a mixture of aspidospermine quebrachine and other quebracho alkaloids **a citrate** $C_{22}H_{30}O_2N \cdot C_6H_8O_7$ = 546 32 An amorphous, orange powder soluble in water or alcohol, it consists of the citrates of quebracho alkaloids **a hydrochloride** $C_{22}H_{30}O_2N_2 \cdot HCl$ = 390 82 An amorphous orange powder, soluble in water or alcohol **a sulfate** $(C_{22}H_{30}O_2N_2)_2 \cdot H_2SO_4$ = 806 61 Colorless crystals, soluble in water or alcohol, used to treat typhoid fever and dyspnea **a sulfate, amorphous** The sulfate of quebracho alkaloids An orange-yellow amorphous powder, soluble in water or alcohol

aspirator A suction apparatus **a bottle** A glass vessel with outlets leading to the top and bottom

aspirin *Acetyl* salicylic acid **methyl-** See *methyl*acetyl salicylate

aspirochyl Mercuric atoxylate

assafetida Same as asafetida

assay Originally the analysis of ores or alloys Now applied to analysis in general, the analysis of pharmaceutical and official drugs in particular **dry-** Assaying by dry methods **wet-** Assaying by wet methods

a balance An analytical balance **a combination furnace** A combination of three furnaces for roasting sulfides, fusing in a crucible, and cupellation **a crucibles** Fireclay crucibles used in the analysis of ores and alloys **a flasks** A glass vessel of shape intermediate between that of a tall beaker and an Erlenmeyer flask **a mill** A small crusher or grinding device for pulverizing ores **a ton** A T = 29 1667 grams **a ton system** In the analysis of gold and silver ores, the number of mg of gold and silver obtained from an assay ton represent the same number of ounces per short ton of 2000 pounds of ore For a ton of 2240 lbs A T = 32 6667 grams **a ton weights** A set of weights (4 A T to $\frac{1}{20}$ A T) used in mineralogical analysis and gold assay

asselline A leucomaine from codliver oil

assimilation Constructive metabolism, or the transformation of non-living matter (food) into living matter (tissues)

associating Forming complexes, *e g*, by polar molecules Cf *solvent* **non-** Describing non-polar molecules which do not form complexes

association The combination, connection or correlation of substances or functions **molecular-** The aggregation of similar molecules, especially in solutions, as, $(H_2O)_2$ and $(H_2O)_3$, or of gases, as, NO_2 and N_2O_4 Cf coordinate bonds, *dissociation, liquids*

astacin, astacene $C_{40}H_{48}O_4$ = 592 34 A carotenoid produced by the oxidation of astoxanthin (q v), a pigment from the lobster, *Astacus gammarus,* sea spider, *Maja squinado,* and starfish, *Ophidiaster ophidianus*

astatic Forces in equilibrium **a couple** See *astatic* galvanometer **a current** An electric circuit arranged in such a way as to be unaffected by the electric field of the earth **a galvanometer** A galvanometer in which an astatic couple effect is produced by two equally strong magnets **a needle** Two magnetic needles placed above one another with reversed poles (N over S)

astaxanthin $C_{40}H_{52}O_4$ = 596 4 See *astacene*

asteriasterol A sterol, m 70, from starfish

asterium A supposed element occurring in the hottest stars Cf *nebulium*

asterubin $C_5H_{13}N_3O_3S$ = 195 2 A guanidine derivative, $Me_2NC(NH)NH(CH_2)SO_3H$, from the starfish, *Aster rubens* and *A glacialis*

asthenics Cerebro-spinal neurotics A drug which produces weakness of muscular power, *e g*, aconite, conium, curare, physostigmine, gelsemium, veratrum

astigmatism The inability of the eye to focus light rays from different meridians on the same point

A S T M American Society for Testing Materials An organization which issues specifications and methods of testing for various materials Cf B S I

Aston, Francis William 1877– An English physicist noted for the development of mass-spectra and Nobel Prize Winner (1922) **A rule** Not more than two isotopes are known for any element of odd atomic number, except among the radioactive elements **A spectrum** A mass-spectrum, from which the isotopic weights of an element are determined

astrakanite, astrochanite $MgSO_4\,Na_2SO_4\,4H_2O$ Blodite A native, magnesium, sodium sulfate, found at Stassfurt

astral oil Same as kerosene

astringency Sourness of taste combined with contracting power, as in tannins

astringent A drug which contracts tissues, and thereby lessens secretions Used in diarrhea and also externally in wounds to check bleeding, *e g*, alum, tannin, silver nitrate zinc sulfate

astrolin $C_{16}H_{22}O_4N_2$ = 306 2 Methylethylglycolic antipyrine $C_7H_{10}O_3\,C_{11}H_{12}ON_2$ A colorless crystalline powder with pleasant acid taste, m 64, soluble in water or alcohol Used to relieve neuralgic headaches

astronautics The study of the physical possibilities of voyaging through space to other celestial bodies

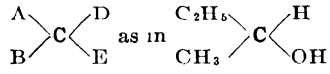
astronomical unit (1) The mean distance from the sun to the earth, 149,500,000 km (2) See *parsec, light year* and *magnitudes*

astronomy A branch of science dealing with the study of the cosmos, and the correlation, motions, and characteristics of celestial bodies

astrophyllite $H_4(K,Na)_2(Fe,Mn)_5(SiTiZr)_7O_{22}$ A native silicate, occurring in bronze-yellow orthorhombic crystals

astrophysics A branch of science dealing with the interpretation of spectral lines which indicate the movement, velocity, composition, temperature, and other characteristics of a celestial body (star, comet, etc)

asymmetric (1) Unsymmetric, *e g*, the 1 2 4-position of benzene (2) Pertaining to an asymmetric atom (3) Triclinic **a atom** An atom which has each of its bonds satisfied or united to a different atom or radical Thus an asymmetric N-atom has three different radicals, and an asymmetric carbon atom (q v) **a carbon** Any carbon atom of an organic compound which has four different radicals or atoms attached to it



Compounds containing one or more a carbon atoms are optically active **a compound** A compound which contains one or more asymmetric atoms Cf *stereoisomerism* **a molecule** See *asymmetric*

asymmetry A dissimilarity or absence of symmetry, as, an unequal distribution of radicals around a ring or atom

asymptotes Rectilinear or curvilinear lines which continually approach a curve without touching it

A T See *assay* ton

atabrine Chinacrin Trade-name for the dihydrochloride of methoxy chlorodiethyl amino pentylamino acridine used as anti-malarial Cf *atebrin*

atacamite, atakamite CuOCl Cu(OH) Remolinite A native, dark-green hydrous copper oxychloride

atalpo clay A Cornish colloidal china clay, used as a soap filler and as a catalyst

-ate A suffix for compounds, (1) which contain a nonmetal in its higher positive valence (cf *-ic*), (2) which are formed from an acid and base (salts)

atebrin $C_6H_3(NH_2)_2Me$ = 122 1 Mecaprine hydrochloride An antimalarial similar to plasmoquin, q v Cf *atabrine*

athamantin $C_{24}H_{30}O_7$ = 430 3 A bitter principle from the roots and seeds of *Athamanta oreoselinum,* an Umbelliferae

athermal A cool spring or mineral water with a temperature below 15°C

atherospermine $C_{30}H_{20}O_5N$ = 474 2 An alkaloid from the bark of *Atherosperma moschatum* the Australian sassafras, a Monimiaceae of Tasmania and Victoria, sometimes used as tea and, by the natives, as an anti-rheumatic and in secondary syphilis

atisine $C_{22}H_{31}NO_2$ = 341 25 Colorless powder, m 85, slightly soluble in water

Atkinson hemin test A method of preparing blood crystals (hemin) for microscopical examination and identification

atm Abbreviation for *atmosphere*

atmolysis The separation of gases by diffusion through porous walls, see *Graham's* law **fractional-** A method for continuous diffusion of a gas, used in the separation of isotopes, *e g*, of chlorine

atmometer An instrument for the determination of the amount of water passing into the air by evaporation

atmos Aer A unit of air pressure on one square centimeter, equal to a column of 760 mm of mercury

atmosphere (1) The air or the gases surrounding the earth (2) The pressure exerted by the air at sea-level (3) A unit of pressure, *e g*, the pressure which equals the weight of mercury, d 13 5951, 760 mm high = 29 922 inches = a pressure of 14 6974 pounds per square inch, or 1 0333 kg per sq cm = 1,013,249 dynes cm $^{-2}$

atmospheric gases The carbon dioxide varies in quantity (approx 0 03 % by vol), and the percentage volumes of the other gases (on the moisture- and carbon dioxide-free air) are —

nitrogen	78 03
oxygen	20 99
argon	0 94
neon	0 0012
helium	0 0004
krypton	0 0001
xenon	0 00001

atmotherapy The treatment of diseases with vaporized substances, *e g*, the application of atomizers in respiratory disorders

atom A chemical unit, the smallest part of an element which remains unchanged during any chemical reaction, and is thus chemically indestructible and indivisible, yet it may undergo physical changes, as, excitation, disintegration and transformation to other atoms Cf *radioactive* elements, *matter* Evidence for the reality of a is the seven different methods of determining Avogadro's number, by observing through a spinthariscope, by photographing Wilson tracks and by crystallograms An a has three fundamental numbers

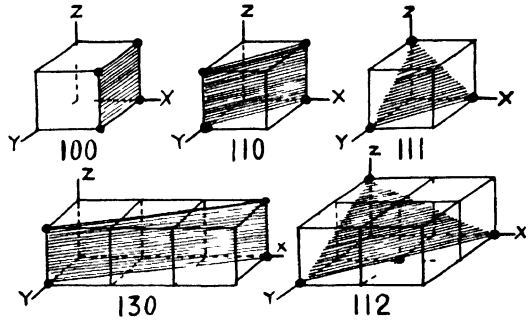
1 Mass number, giving the number of protons and neutrons (=*isotopic weight*)
2 Atomic number, giving the number of extranuclear electrons
3 Packing fraction, which is an indication of the forces binding nuclear particles together

See also *atomic* structure **activated-** Excited **asymmetric-** See *asymmetric a* **Bohr-** The concept of a dynamic atom derived from phenomena of radiations Cf *atomic* structure 5 **charged-** An electrically charged a , an *ion* **chemist's-** Lewis- **cubical-** Lewis- **dark-** An a that does not emit radiations **dynamic-** Bohr- **excited-** Activated- An a in which the electrons are moving in elliptical orbits or on a higher *energy level*, q v Such a are found in sun and stars, and are produced in the laboratory by exposing vapors and gases to strong electric fields or radiations The chemical symbol plus asterisk differentiates the excited from non-excited a , thus $K \rightarrow K^*$, or $Cl_2 + h\nu = Cl^* + Cl$ **exploding-** An a which undergoes a radioactive change by the spontaneous emission of electrons or helium nuclei **fluctuating** Schrodinger- **giant-** An entity so large in size and fixed in form as to surround all matter It is supposed to fill and create space **ionized-** An a from which some of the valence electrons are removed (positive ion), or which has captured additional electrons (negative ion) **irradiated-** See *irradiation* **kinetic-** Bohr- **labelled-** *Radioactive* indication **Langmuir-** An elaborated concept of Lewis- Cf *atomic* structure 4 **Lewis-** The concept of a static a as derived from the phenomena of crystal structure and chemical bonds Cf *atomic* structures 3 and 4 **neutral-** An a in which the positive nuclear charge is balanced by the negative electrons, the latter may be either in the normal or excited state and thereby differ from the stripped a (q v) and ionized a **normal-** An a which is neither excited nor ionized in which the electrons are supposed to be in their lowest energy levels **nuclear-** Stripped- **physicist's-** Bohr- **planetary-** Rutherford's- **pulsating-** Schrodinger- **radiating-** An a in which the electrons are passing from a higher to a lower energy level and which thereby, emits radiations Cf *quantum* **recoil-** An a from which an alpha particle is being thrown off and which thereby, recoils with a speed corresponding with its mass Cf *radioactivity* **Rutherford's-** The original concept (1911) of a planetary a which resembles a solar system Cf *atomic* structure 1 **Schrodinger-** The concept of a pulsating a consisting of an electric field of different intensities Cf *atomic* structure 6 **static-** Lewis- **stripped-** An a whose electrons have been removed by strong electric fields or extremely high temperature They are supposed to exist in the interior of stars, and to account for the extreme densities of some celestial objects Cf *spectral* classification **tetrahedral-** An a in which pairs of electrons are supposed to oscillate around centers located like the four corners of a tetrahedron It is a later modification of Lewis a Cf *atomic* structure 4

a annihilation The destruction of matter by its complete transformation into radiation, $Mc^2 = E$, where M is the mass in grams, c the velocity of light in cm per sec , and E the energy in ergs This is assumed to occur inside stars where pressure, temperature and density are extremely high, and it is the source of stellar energy **a building** The formation of atoms from + and − electrons, especially the formation of He, O, Si, and Fe from H This process is assumed to occur in interstellar space, where pressure, temperature and density are extremely low It generates the highly penetrating cosmic rays, $\delta E/c^2 = \delta M$ **a creation** The creation of matter by the complete transformation of energy $E/c^2 = M$, into positive and negative electrons, hydrogen atoms This process is as yet hypothetical, but a necessary link in the mass-energy cycle **a disintegration** The partial transformation of mass into energy, $c^2\delta M = \delta E$, as in *natural* or *radioactive* disintegration or in *artificial* d by the splitting off of H-nuclei by bombardment with α-particles, thus, 1 disintegration is obtained with B, N, F, Ne, Na, Mg, Al, Si, P, S, Cl, A, K 2 Disintegration is not obtained with H, He, Li, C, O, Ni, Cu, Zn, Sc, Kr, Mo, Pd, Ag, Sn, X, Au, U Cf *nuclear* chemistry, artificial radioactivity **a fragment** The disintegration product of an atom that has been split by an α-particle, as observed by the *Wilson* method, q v **a meter** *Ångström* unit **a model** (1) Atomic model (2) A wooden model which illustrates the valency of an a and the structure of a molecule (*Erloart*) A set of tetrahedra to illustrate isomerism (*Kekulé*) A set of spherical balls with a number of pins correspond-

ing with the valency, which joined together, represent the structure of a molecule (*Wislicenus*) A set of wooden tetrahedra to illustrate the isomerism of organic compounds (3) An electrical or magnetic device which illustrates the structure of the a or some of its properties **a of electricity** Electron

atomic Pertaining to the ultimate electrical unit of an element **a diameter** The imaginary line connecting the extreme electron orbits through the center of the a **a disintegration.** The breaking up of an a under certain conditions, as, *natural-* or radioactive d which yields helium nuclei, and *artificial-* d or bombardment with electrons or alpha-particles, which yields ionized hydrogen Cf *nuclear* chemistry **a distance** The average or equilibrium length between the centers of two atoms expressed in Ångstrom units They are determined from crystal structure and band spectra data, and may be calculated from a radii **a domain** The imaginary sphere occupied by the a structure **a energy** The force which holds the a together, or the amount of energy liberated when an atom disintegrates or is transformed 1 gm radium is equivalent to 2 billion calories Cf *packing* effect **a excitation** See excited *atom, excitation* **a evolution** Cf *spectral* classification, "*old* age" theory **a field** The space around an atom which cannot normally be penetrated by other atoms See *molecular* diagram, *magnetic* field **a fragment** Cf *atom* fragment **a frequency** Characteristic K radiations Cf Moseley *spectrum* and a number **a group** Radical **a heat** The amount of heat required to raise the temperature of one gram atom of an element one °C, hence, the product of the specific heat, H, and the atomic weight, A, of an element $H \times A = 6.4$ Cf *heat* capacity **a kernel** An atom stripped of its valence electrons, it differs from the a nucleus **a mass** The quantity of matter, q v, contained in an atom This has been measured for hydrogen by determining the ratio $m/e = 1.04 \times 10^{-4}$, where m is the mass of H atom and e the electric charge, hence, if $e = 1.57 \times 10^{-20}$, the mass of H is 1.64×10^{-24} gram, and the mass of any other atom is its a weight multiplied by this quantity **a meter** Ångstrom unit **a migration** *Molecular* rearrangement **a model** The concept of a structure, as, Bohr's, Lewis', and Schrodinger's atoms **a nucleus** The central, positively-charged part of an atom consisting of I positive charges and (I-N) negative charges, where I is the isotopic weight and N the atomic number Cf *neutron, proton, kernel* **a number** Ordination number, N or Z (zahl) An integer which indicates the order of the elements in the periodic system, and which is assumed to represent the number of negative electrons located outside the a nucleus It is related to the frequency, ν, and wavelength, λ, of the x-ray spectrum of an element by $c/\lambda = \nu = C(A - b)^2$, where C and b are constants A the a number, and c the velocity of light For the K radiations the equation becomes $\sqrt{\nu} = \frac{3}{4}R(A - 1)$, and for the L series $\sqrt{\nu} = \frac{5}{36}R(A - 7.5)$, where R is Rydberg's constant **a oscillations** The vibrations of a nuclei or atoms within a molecule Cf *activated* molecule **a percentage** The percentage by weight of a mixture, or system of compounds divided by the atomic weight, hence, the relative abundance or number of atoms in 100 parts, thus, NaCl = 50 % Na-atoms, 50 % Cl-atoms, HNO_3 = 20 % H-atoms, 20 % N-atoms, 60 % O-atoms **a plane** The imaginary surface which passes through a set of atoms in a space lattice, and indicated by the Miller indices 100, 110, 111, etc (see figure) **a**



Atomic planes

potential *Ionization* potential **a properties** Those characteristics of an element which depend on a structure (q v), as opposed to those properties due to molecular structure and molar states **a. radius** (1) The distance from the a nucleus to the valence electrons (2) The half-way distance between like atoms, it is relatively constant and depends on the type of bond between the atoms By

ATOMIC RADII
(Ångstrom units)

Single bond radii

B	C	N	O	F
0 89	0 77	0 70	0 66	0 64
	Si	P	S	Cl
	1 17	1 10	1 04	0 99
	Ge	As	Se	Br
	1 22	1 21	1 17	1 14
	Sn	Sb	Te	I
	1 40	1 41	1 37	1 33

Double bond radii

B	C	N	O
0 80	0 69	0 63	0 59

Triple bond radii

C	N	O
0 61	0 55	0 52

adding the radii of different unlike atoms their distances can be found, thus the a r for the single bond C is 0 77, for single bond N is 0 70, hence the distance C—C is 1 54, C—N is 1 47 and N—N is 1 40 **a refraction** The product of the specific refraction and the a weight of an element **a species** (1) Any one of the atoms of the 92 elements (2) Isotopic species Any of the many types of a structures characteristic of each isotope Thus the element chlorine consists of the a species Cl^{35} and Cl^{37}, or isotopes with isotopic weights of 35 and 37 **a structure** Theories of the composition or constitution of atoms, based upon a speculative interpretation of chemical and physical properties of the elements Some of the

TABLE OF ELEMENTS
ATOMIC NUMBERS AND ATOMIC WEIGHTS (TO SEPT 1940)

The *atomic weights* are those accepted by the International Committee, where none is given it indicates that no actual determinations have been made, but theoretical values can be obtained from the *periodic* system, q v *Synonyms* of elements are given where a symbol has been derived from them

Element	*Symbol*	*At number*	*At weight*
actinium	Ac	89	
actinon	An	86	
alabamine	Am	85	
aldebaranium, Ad, is *thulium*			
aluminum	Al	13	26 97
anglo-helvetium, is *alabamine*			
antimony	Sb	51	121 76
argentum is *silver*			
argon	A	18	39 944
arsenic	As	33	74 91
aurum is *gold*			
azote, Az, is *nitrogen*			
barium	Ba	56	137 36
beryllium	Be	4	9 02
bismuth	Bi	83	209 00
bohemium, Bo, is *rhenium*			
boron	B	5	10 82
brevium, Bv, is *ekatantalum*			
bromine	Br	35	79 916
cadmium	Cd	48	112 41
caesium is *cesium*			
calcium	Ca	20	40 08
cassiopeium, Cp, is *lutecium*			
carbon	C	6	12 010
celtium, Ct, is *hafnium*			
cerium	Ce	58	140 13
cesium	Cs	55	132 91
chlorine	Cl	17	35 457
chromium	Cr	24	52 01
cobalt	Co	27	58 94
columbium	Cb	41	92 91
copper	Cu	29	63 57
cuprum is *copper*			
denebium, De, is *thulium*			
dubhium, Db, is *ytterbium*			
dysprosium	Dy	66	162 46
ekatantalum, Et, is *protactinium*			
eline	El	85	
emanation, Em, is *radon*			
erbium	Er	68	167 2
europium	Eu	63	152 0
ferrum is *iron*			
florentium, Ft, is *illinium*			
fluorine	F	9	19 00
gadolinium	Gd	64	156 9
gallium	Ga	31	69 72
germanium	Ge	32	72 60
glucinium, Gl, is *beryllium*			
gold	Au	79	197 2
hafnium	Hf	72	178 6
helium	He	2	4 003
holmium	Ho	67	164 94
hydrargyrum, is *mercury*			
hydrogen	H	1	1 0080
illinium	Il	61	
indium	In	49	114 76
iodine	I	53	126 92
ionium	Io	90	
iridium	Ir	77	193 1
iron	Fe	26	55 85
kalium is *potassium*			
krypton	Kr	36	83 7

Element	*Symbol*	*At number*	*At weight*
lanthanum	La	57	138 92
lead	Pb	82	207 21
lithium	Li	3	6 940
lutecium	Lu	71	174 99
magnesium	Mg	12	24 32
manganese	Mn	25	54 93
masurium	Ma	43	
mercury	Hg	80	200 61
molybdenum	Mo	42	95 95
natrium, is *sodium*			
neodymium	Nd	60	144 27
neon	Ne	10	20 183
nickel	Ni	28	58 69
niobium, Nb, is *columbium*			
nitrogen	N	7	14 008
niton, Nt, is *radon*			
osmium	Os	76	190 2
oxygen	O	8	16 0000
palladium	Pd	46	106 7
phosphorus	P	15	30 98
platinum	Pt	78	195 23
plumbum, is *lead*			
polonium	Po	84	
potassium	K	19	39 096
praseodymium	Pr	59	140 92
protactinium	Pa	91	231
radium	Ra	88	226 05
radon	Rn	86	222
rhenium	Re	75	186 31
rhodium	Rh	45	102 91
rubidium	Rb	37	85 48
ruthenium	Ru	44	101 7
samarium	Sm	62	150 43
scandium	Sc	21	45 10
selenium	Se	34	78 96
silicon	Si	14	28 06
silver	Ag	47	107 880
sodium	Na	11	22 997
stibium, is *antimony*			
stannum, is *tin*			
strontium	Sr	38	87 63
sulfur	S	16	32 06
tantalum	Ta	73	180 88
tellurium	Te	52	127 61
terbium	Tb	65	159 2
thallium	Tl	81	204 39
thorium	Th	90	232 12
thoron	Tn	86	
thulium	Tm	69	169 4
tin	Sn	50	118 70
titanium	Ti	22	47 90
tungsten	W	74	183 92
uranium	U	92	238 07
vanadium	V	23	50 95
verium	Ve	87	
wolfram is *tungsten*			
xenon	Xe	54	131 3
ytterbium	Yb	70	173 04
yttrium	Y	39	88 92
zinc	Zn	30	65 38
zirconium	Zr	40	91 22

properties accounted for by the composition of a nucleus and the arrangement of electrons are, classified

ATOMIC STRUCTURE

Nucleus (*H, He, ϵ*)	Electrons (*ϵ, quanta*)	
	static, in shells	dynamic, in orbits
atomic weight	valency	gaseous ionization
isotopic weight	polar and non-polar bonds	excitation
mass spectra	ionization	radiation
atomic number	crystal structure	luminescence
atomic frequency	oxidation-reduction	spectrum and spectral lines
radioactivity	density	irradiation
abundance		

(1) The atom consists of an extremely small, positively-charged nucleus containing the mass of the atom, surrounded by a number of electrons sufficient in number to neutralize the electric charge The number of positive charges on the nucleus varies from 1 to 92 and corresponds with the a number, the number of total charges varies from 1 to 238, and corresponds with the isotopic weight Thus, in the case of uranium the nucleus contains 238 positive and 146 negative electrons, leaving a positive charge of 92, which is neutralized in the normal atom by 92 electrons arranged in a definite order, the outermost being the valence electrons (*Rutherford, et al*) Cf *periodic* system

(2) The nucleus itself, 10^{-12} cm in diameter, consists of α-particles, (=He nuclei), protons (=H nuclei) and electrons, which are closely packed together (*Prout, Harkins*) Cf *packing* effect, *isotopes*

(3) The electrons are distributed in successive layers of 2, 8, 8, 18, 32, and 18 electrons, respectively (*Kossel, Lewis*) Cf *orbits, shells, periodic* system, *Stoner* quanta, *Pauli's* principle

(4) The electrons oscillate in shells, usually pairs, around centers corresponding with the corners of a cube or tetrahedron, as, in crystals solids and liquid compounds (*Lewis, Langmuir*) Cf *octet, kernel, valency*

(5) The electrons rotate in orbits, which may be circular or elliptical and at different energy levels, as, in luminous gases and excited molecules (*Bohr, Sommerfeld*) Cf *orbits, quantum, excitation*

(6) The atom as a whole comprises electric fields of various intensities, which may pulsate or fluctuate in definite modes which corresponding with the various energy levels (*Schrödinger*) Cf wave mechanics

a theory (1) The modern concept of a structure (2) The idea of finite particles of matter, as conceived by Democritus (400 B C) Xenophanes, Lucretius, and others, and established by Dalton (1808) and others Cf *kinetic* theory **a transformation** The building up of atoms of higher a weight from those of lower a weight **a transmutation** An artificial process for changing one atom into another, as, in artificial disintegration Cf *nuclear* chemistry **a volume** The space, AV, occupied by one gram atom of an element It is obtained by dividing the atomic weight, AW, by the density, D, of the solid or liquid element hence, AV = AW/D **a weight** A number indicating the relative weight of an element as compared with hydrogen (=1 0080) or oxygen (=16 000) It is the mean value of the isotopic weights of an element Its accuracy is indicated by the number of significant figures following the decimal point From the most accurate determinations the most reliable are selected and published annually by an international committee *absolute-* The actual weight of an atom *chemical-* The a w determined by chemical methods and *weight* relations, they are based on oxygen gas = 16 000, the O_2 being a mixture of isotopes 16, 17, 18 *physical-* The a w determined by physical methods and *mass* relations Thus *Chem A W = Phys A W* /1 00022

RELATION OF ATOMIC WEIGHTS

	Physical	*Chemical*	*Absolute*
H	1 00755	1 00778	1 662*
He	4 0013	4 0018	6 5994*
F	18 996	19 00	——
proton	1 0072	——	1 661*
alpha particle	4 00106	——	6 598*
electron	0 00054S		9 040**

* $\times 10^{-24}$ gm
** $\times 10^{-28}$ gm

rational- The a w referred to weighings in vacuo, corrected for buoyancy in air These weights should be used in accurate analytical work

atomicity Valency

atomization Breaking up a liquid into a fine spray

atomizer A device for breaking a liquid into a spray or fog, a nebulizer

atom-meter Ångstrom unit

atomology The study of atoms and their structure

atophan $C_{16}H_{11}NO_2$ = 249 1 Phenylquinoline carboxylic acid, phenylcinchoninic acid quinophen agotan, cinchophen, Ph C_9H_5N COOH Colorless crystals subliming at 200, used as an antirheumatic and in gout Cf *acitrin*

atopite $CaSb_2O_7$ A native calcium antimonite, which occurs in yellow or brownish isometric masses

atoquinol $C_{16}H_{11}O_2N$ = 289 1 Phenyl cinchoninic acid, a yellow powder insoluble in water, used as antirheumatic

atoxyl $NaC_6H_7O_3NAs$ = 239 1 Sodium-m-arsenite-anilide, arsamin, sodium arsanilate A white odorless powder, used in hypodermic medication Cf *maretin* **acetyl-** Arsacetin **a mercury** Mercuric atoxylate

atoxylate Arsanilate A salt of arsanilic acid which contains the divalent $MH_2C_6H_4AsO_3$ = radical

atoxylic acid Arsanilic acid

atractylene $C_{15}H_{24}$ = 204 19 A sesquiterpene, d 0 927, b_{14mm} 141, from the essential oil of *Atractylis*, a Compositae of Asia

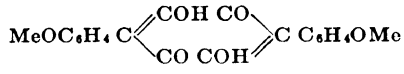
atractylol $C_{15}H_{26}O$ = 222 2 A solid alcohol, d 1 511, m 59, b 292, from the essential oil of *Atractylis*

atreol Ammonium atreolate An aqueous solution of a mixture of ammonium salts derived from organic acids, in which the N is in the sulfonic radical A black, sirupy liquid, soluble in water, and used as mild antiseptic

atroglyceric acid $C_9H_{10}O_4$ = 182 1 α-phenylglyceric acid, $CH_2OH\ C(OH)Ph\ COOH$ White crystals, m 146

atrolactic acid $C_9H_{10}O_3$ = 166 1 α-phenyl lactic acid, α-methyl mandelic acid, hydroxyhydratropic acid, atrolactinic acid, $Me\ C(OH)Ph\ COOH$, H_2O Colorless crystals, m 90, soluble in water

atromentin $C_{20}H_{16}O_6$ = 352 12 *2 5*-Dihydroxy-*3 6*-bis (p-methoxy phenyl) quinone A plant pigment having the formula



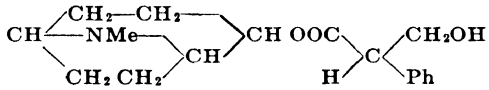
atronene $C_{16}H_{14}$ = 206 11 Atronol, phenyldihydronaphthalene A colorless hydrocarbon, m 326, insoluble in water

atronic acid $C_{17}H_{14}O_2$ = 250 21 Colorless prisms, m 164, soluble in water or alcohol

atropamine Apoatropine

atropic acid $C_9H_8O_2$ = 148 1 α-phenylacrylic acid, α-methylene-α-toluic acid, $CH_2\ CPh\text{-}COOH$ Colorless, monoclinic scales, m 106, b 267 decomp , sparingly soluble in water, soluble in alcohol or carbon disulfide It is obtained from atropine by boiling with alkali **iso-** Isatropic acid **methyl-** $C_6H_5\ C(NCH\text{-}CH_3)COOH$ = 176 1 Colorless crystals, m 135

atropine $C_{17}H_{23}O_3N$ = 289 28 Coromegine, daturine, l-tropine, tropyl tropate, tropin tropic ester, *dl*-hyoscyamine The alkaloid



from *Atropa belladonna*, deadly nightshade, or *Datura stramonium* Colorless needles, m 115, slightly soluble in water, alcohol, or ether It is an antispasmodic, mydriatic and antidote for morphine, pilocarpine and prussic acid The antidotes of atropine are emetics, stomach pump, pilocarpine, morphine **a arsenate** $(C_{17}H_{23}O_3N)_2H_3AsO_4$ = 720 56 Colorless crystals, soluble in water or alcohol **a borate** $(C_{17}H_{23}O_3N)_2B_4O_7$ = 733 6 White crystals, soluble in water or alcohol **a gold hydrochloride** $C_{17}H_{23}O_3N\ HAuCl_4$ = 629 33 Yellow leaflets, m 136, slightly soluble in water **a hydrobromide** $C_{17}H_{23}O_3N\ HBr$ = 370 2 Colorless crystals, soluble in water **a hydrochloride** $C_{17}H_{23}O_3NHCl$ = 325 78 White crystals, soluble in water or alcohol **a hydroiodate** $C_{17}H_{23}O_3N\ HIO_3$ Colorless crystals, soluble in water **a iodate** $C_{17}H_{23}O_3N\text{-}HIO_3$ = 465 21 Colorless crystals, soluble in water **a methylbromide** $C_{16}H_{20}O_3N(CH_3)_2\text{-}Br$ = 384 1 White crystals, m 222, soluble in water or alcohol **a methylnitrate** $C_{16}H_{20}O_3\text{-}N(CH_3)_2NO_3$ = 366 1 Eumydrine White crystals, which are odorless and soluble in water or alcohol **a nitrate** $C_{17}H_{23}O_3N\ HNO_3$ = 352 28 Colorless crystals, soluble in water or alcohol **a salicylate** $C_{17}H_{23}O_3N\ C_7H_6O_3$ = 410 3 Colorless, deliquescent powder, soluble in alcohol or water **a santonate** $C_{17}H_{23}O_3N\text{-}C_{15}H_{20}O_4$ = 553 3 Colorless crystals, soluble in water **a stearate** $C_{17}H_{23}O_3N\ C_{18}H_{36}O_2$ = 573 3 A colorless powder, used in ointments **a sulfate** $C_{17}H_{23}O_3N\ H_2SO_4$ = 387 36 Colorless crystals, m 192, soluble in water, alcohol or ether It is extensively used in ophthalmology **a valerate** $C_{17}H_{23}O_3N\ C_5H_{10}O_2\ \frac{1}{2}H_2O$ = 400 33 Colorless crystals, m 42, soluble in water alcohol or ether

atroscin Hyoscine hydrobromide

atroscine $C_{17}H_{21}O_4N\ H_2O$ = 321 27 l-Hyoscine, l-scopolamine An alkaloid from *Scopolia atropoides*, a Solanaceae Transparent crystals, soluble in water, alcohol or ether

atroxindole C_9H_9ON = 147 1 Methyl-oxindole Colorless crystals, m 119

attar of roses An essential oil from damascene and cabbage roses, used in perfumery

attemperator A pipe through which water flows at a constant temperature It is used to control the temperature of a vessel in which it is immersed

attenuation (1) The process of making less virulent or weakening the toxicity of a microorganism or virus (2) The extent to which the specific gravity of a liquid has been lowered by alcoholic fermentation

attraction The force which holds the molecules of a solid or liquid together **chemical-** Affinity **capillary-** The forcing between dissimilar molecules of a fluid which raises or depresses the fluid in a capillary tube **electric-** The force by which electrically oppositely-charged bodies are drawn together **electron-** The force exerted by an atomic nucleus on the electron pair, it constitutes a *bond* **gravitational-** Gravitation **magnetic-** The action of a magnet in holding iron particles **mechanical-** See *adhesion* and *cohesion* **radiant-** See *relativity* (general)

attraxin The radical of a compound which has a chemotactic effect on epithelial tissue

attritus A constituent of coal of botanical origin

Atwater calorimeter A bomb calorimeter for determining the heating value of foods, fats and oils, coal, etc

Au The symbol for gold (aurum)

aubepine Anisaldehyde

aucubin A glucoside from greater plantain, *Plantago major* White needles, m 180, soluble in water or alcohol

audiometer An apparatus for testing the hearing Cf *eudiometer*

audion *Electric* valve

audiphone A device for increasing the volume of sounds

Auer metal A mixture of 65 % mischmetal and 35 % Fe, used as pyrophoric alloy in gas lighters and for tracer bullets

Auer von Welsbach Welsbach

auerbachite A native, amorphous earthy zirconium silicate

auerlite A native thorium silico-phosphate from North Carolina Cf *monazite*

augelite A natural, basic aluminum phosphate

augite $CaMg_2Al_2Si_2O_{10}$ Malacolite A dark aluminum pyroxene, which occurs in basalt Cf *sahlite*

augmentation (1) A proposed term for oxidation (2) Opposed to diminution Cf *electronation*

augustione Angustione

aura (1) The current of air or breeze produced by the discharge of static electricity from a point (2) A peculiar radiation said to emanate from living organisms, which can be photographed by the use of a fluorescent screen prepared from dicyanine solution Cf *scotography*

auramine $C_{17}H_{21}N_3$ = 267 28 Tetramethyl-p2-diamidoimido benzophenone, yellow pyoktannin Yellow scales, m 136, insoluble in water, soluble in alcohol Used as a dye for silk, wool, paper and leather **a hydrochloride** $Me_2N\,C_6H_4\,C(NH_2)\,C_6H_4\,NMe_2Cl$ The auramine of commerce A sulfur-yellow powder, soluble in alcohol, ether or water Used to color foods, textiles, leather and paper, also as antiseptic

aurantia An orange nitramine aniline dye, used in foodstuffs, for light filters and as a biological stain

Aurantiaceae The orange family, a group of trees and shrubs with a juicy fruit with a leathery skin and contain a fragrant essential oil See *Citrus*

aurantiin Naringin

aurantine An orange extract

aurantium The Latin term for orange

aurate A salt of auric acid containing the trivalent AuO_3 ≡ radical

aureolin Primulin

auri The official Latin for gold

auribromhydric acid $HAuBr_4\,5H_2O$ = 607 96 A yellow crystalline mass, m 27, soluble in water

auribromide Bromaurate A salt of the type $MAuBr_4$

auric A compound of trivalent gold, Au ≡ **a acid** H_3AuO_3 = 248 2 Auric hydroxide A yellow-brown powder, decomp 150, insoluble in water, soluble in alkalis with the formation of aurates **a bromide** $AuBr_3$ = 436 96 Gold tribromide A dark brown to black powder, soluble in water, ether or alcohol It is an antiepileptic, nervine and anodyne **a chloride** $AuCl_3$ = 303 58 Gold trichloride Red leaflets, d 3 9, soluble in water, alcohol or ether, used in photography It sublimes if heated and decomp at 180 **a chloride acid** $AuCl_3\cdot HCl\,4H_2O$ = 412 11 Aurochlorohydric acid Yellow crystals, soluble in water, alcohol or ether It contains 49 % gold **a chloride cryst** $AuCl_3\,2H_2O$ = 339 61 Cryst gold trichloride Orange-yellow leaflets, soluble in water **a chloride fused** $AuCl_3\,HCl\,xH_2O$ Brown masses, soluble in water, alcohol or ether Used in photography and electroplating etc , and medicinally, as an antituberculosis and alterant It contains 50–51 % gold **a cyanide** $Au(CN)_3\,6H_2O$ = 383 33 Gold tricyanide, gold cyanide White hygroscopic crystals, soluble in water or alcohol Used in the treatment of tuberculosis **a hydroxide** $Au(OH)_3$ = 248 22 Gold hydroxide, auric acid Yellowish-brown powder, decomp 150, insoluble in water, soluble in alkalis with the formation of aurates **a iodide** AuI_3 = 577 96 Gold triiodide A dark green powder, decomp when heated, and insoluble in water **a nitrate acid** $Au(NO_3)_3\,HNO_3\,3H_2O$ = 500 30 Gold hydrogen nitrate Yellow triclinic crystals, decomp on heating, soluble in water **a oxide** Au_2O_3 = 442 2 Gold oxide, gold trioxide A black powder which loses oxygen on heating and is insoluble in water **a potassium bromide** $KAuBr_4\,2H_2O$ = 592 4 Gold potassium bromide, Potassium auric bromide, potassium bromaurate Yellow needles, soluble in water Used as an antiepileptic **a potassium chloride** $KAuCl_4\,2H_2O$ = 414 4 Gold potassium chloride, potassium auric chloride, potassium chloraurate Yellow needles, soluble in water, used in photography and as a ceramic pigment **a potassium cyanide** $KAu(CN)_4\,2H_2O$ = 376 5 Potassium auric cyanide Yellowish crystals, soluble in water **a potassium iodide** $KAuI_4$ = 743 8 Gold potassium iodide, potassium auric iodide, potassium iodo aurate Shining black crystals, which decomp when heated, soluble in water **a sodium bromide** $NaAuBr_4\cdot 2H_2O$ = 576 2 Gold sodium bromide, sodium auric bromide, sodium bromaurate Black crystals, soluble in water An antiepileptic, used in 2 % solution for hypodermic medication **a sodium chloride** $NaAuCl_4$ = 362 2 Gold sodium chloride, sodium auric chloride, sodium chloraurate Yellow crystals, soluble in water, used as a nervine and alterant **a sulfate** $Au_2O_3\,2SO_3\,H_2O$ = 620 54 Gold sulfate Yellowish deliquescent crystals, decomp on heating, soluble in water **a sulfide** Au_2S_3 = 490 58 Gold trisulfide A brown powder, insoluble in water soluble in alkali sulfide solutions

aurichalcite The native $2(ZnCu)CO_3,\,3(ZnCu)(OH)_2$

aurichloride A salt containing the monovalent $AuCl_4$—radical

aurichlorohydric acid *Auric* chloride acid

auricome *Hydrogen* peroxide

auricyanhydric acid $HAu(CN)_4$ = 302 24 Auric cyanide acid Gold hydrocyanic acid Colorless crystals, soluble in water

auricyanide A double cyanide containing the monovalent $Au(CN)_4$— radical, *e g* , potassium auricyanide

auriferous Containing gold *e g* , an ore

auriiodide A compound containing the monovalent —AuI_4 radical

aurin $C_{19}H_{14}O_3$ = 290 22 Pararosolic acid Coralline A triphenylmethane dye obtained by diazotizing p-rosaniline $(HO\,C_6H_4)_2=C=C_6H_4\,O$ Red needles, m 220 (decomp), insoluble in water, soluble in alcohol, ether or alkalis Used as a dye in textile printing, and in wall-paper manufacture, also as indicator, which changes at pH 7 5 from yellow (acid) to magenta (basic) Cf *rosolic acid* **a carboxylic acid** Aluminon

auripigment Arsenous sulphide

auro Aurous

auroauric A compound containing divalent gold or one atom each of mono- and trivalent gold **a bromide** $AuBr_2$ = 357 04 or Au_2Br_4 = 714 08 A black powder, insoluble in water **a chloride** $AuCl_2$ = 268 12, Au_2Cl_4 = 536 24 Gold dichloride Dark red crystals, insoluble in water **a oxide** AuO = 213 2 An olive-brown powder, insoluble in water **a sulfide** Au_2S_2 = 458 5 A black powder, insoluble in water and decomp by heat

aurochin Quinine p-amido-benzoate

aurobromide Bromaurite A salt of the type $MAuBr_2$

aurochloride A double chloride containing the monovalent $AuCl_2$— radical, *e g* , sodium aurochloride, $NaAuCl_2$

aurocyanide A double cyanide containing the monovalent $Au(CN)_2$— radical, *e g* , potassium aurocyanide, $KAu(CN)_2$

aurodiamine $AuHN\,NH_2$ = 228 3 Fulminating gold A dirty olive-green powder prepared by digesting precipitated auric hydroxide with ammonia When dry it explodes with great violence if struck or heated

auroglaucine $C_{19}H_{22}O_3$ = 298 1 A pigment produced on textiles by the action of *Aspergillus glaucus*

auromine $C_{17}H_{23}N_3$ = 269 30 Rose colored needles, m 96, soluble in alcohol or benzene, and insoluble in water

aurora Aurora Borealis A display of variously-colored lights in the upper atmosphere, above 87 km The spectrum shows a conspicuous green line, 5577 3A, due to oxygen, and other lines due to nitrogen In rare cases the aurora has been observed in the lower strata of the atmosphere **a tube** A vacuum tube of uranium glass used for electric discharges

aurorium A hypothetical element said to produce the characteristic lines of the aurora, which are apparently due to ionized N and O atoms Cf *nebulium*

aurosulfide A salt containing the AuS— group

aurous A compound of monovalent gold, Au— They resemble monovalent silver and copper compounds **a bromide** AuBr = 277 14 Gold monobromide Green or grayish-yellow powder, decomp 115, insoluble in water **a bromide acid** AuBr HBr $5H_2O$ = 448 2 Aurobromhydric acid Red crystals, soluble in water **a chloride** AuCl = 232 66 Gold monochloride Yellow crystals, decomp on heating and in water **a cyanide** AuCN = 223 22 Gold monocyanide Yellow crystals, decomp on heating, insoluble in water, soluble in KCN solutions Used to treat tuberculosis **a hydroxide** AuOH = 214 2 Brown crystals, decomp 250 **a iodide** AuI = 324 12 Gold monoiodide A greenish-yellow powder, decomp 120, slightly soluble in water It is an alterant **a oxide** Au_2O = 410 4 A violet powder, decomp 250 is insoluble in water or alcohol **a potassium cyanide** $KAu(CN)_2$ = 288 4 Gold potassium cyanide potassium aurous cyanide, potassium cyanaurite, potassium aurocyanide A white crystalline powder soluble in water and used as an antiseptic and in electroplating **a sodium cyanide** $NaAu(CN)_2$ = 272 2 Gold sodium cyanide, sodium aurous cyanide, sodium cyanaurite White crystals, soluble in water and used in electroplating **a sulfide** Au_2S = 426 46 A brownish-black powder insoluble in water soluble in alkali sulfide solutions

aurum Latin for gold **a vegetabile** Pipitzahoic acid

ausgangs-material Those organic compounds which form the starting-point of an organic synthesis, the "beginning material"

ausonium See *ekarhenium* and *esperium*

austenite A carbon-iron compound formed in highly carbonized steel, it is γ-ferrite with Fe_3C formed by quenching Cf *martensite*

australene Pinene

austrium A supposed element, discovered (1900) by Przibram, which was shown to be gallium

auto- A prefix from the Greek "self"

auto-activation Activation of a gland by its own secretions

autocatalysis Catalysis produced by the products of a catalytic reaction

autoclave An apparatus for heating liquids, or sterilizing under high steam pressure

autocoid An early term for hormone

autocollimation spectroscope A spectroscope for comparing spectra

autocytolysis Autolysis

autocytotoxin A toxin formed in the body by the absorption of degenerated cells

autodecomposition A decomposition autocatalysis (q v)

autodyne $C_9H_{12}O_3$ = 168 1 Phenoxy glycerin, phenylglycerin, $CH_2OPh\ CHOH\ CH_2OH$ White crystals, used medicinally as an anodyne

autogenesis Abiogenesis

autogenor A gas generator which produces oxygen automatically from "oxone" cartridges or cubes (q v)

auto-ignition The temperature at which a compound ignites spontaneously Cf *flashpoint*

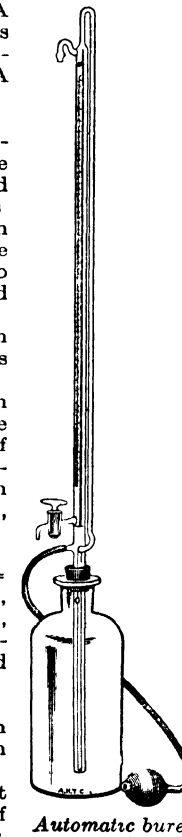
autolysate The liquid obtained by the self-liquefaction of organic cells or tissues

autolyse The act of liquefaction of organic cells

autolysis The self-decomposition or self-disintegration of the tissue cells, or the dissolving of cells by their own serum Cf *heterolysis*

autolyzate, autolyze See *autolysate, autolyse*

automatic Self-working or self-regulating **a buret** A buret provided with an overflow at the zero point **a pipet** A pipet with an overflow at its mark used for rapidly measuring liquids **a respirator** A gas mask



Automatic buret

automolite Gahnite

autooxidation (1) The oxidation of substances by the atmosphere without the aid of other oxidizing agents (2) An oxidation reaction which requires the presence of an inductor in order to take place See induced *reaction*

autophytes Plants which can live on inorganic matter, as opposed to saprophytes, q v

autotrophic Describing an organism that is able to derive its energy by oxidation of inorganic substances, *e g*, sulfur, and does not depend on organic substances for its life, *e g*, certain bacteria

autoxidation Autooxidation

autunite $CaU_2P_2O_{20}H_{16}$ = 915 1 A native, yellow, calcium, uranium phosphate, forming orthorhombic crystals, found in Utah and South Dakota ($CaO\ 2UO_3\ P_2O_5\ 8H_2O$)

auvergnose A diorite from Mitchell County, North Carolina

auximone An agent that stimulates the growth of seedlings and plants, as, pantothenic acid, auxin, etc

auxin A $C_{18}H_{32}O_5$ = 328 25 A plant hormone from *Avena*, m 196, which stimulates the growth of seedlings **a B** $C_{18}H_{30}O_4$ = 310 23 A plant hormone from maize germ

auxiometer A device for measuring the magnifying power of lenses

auxochrome A group of atoms as $—NH_2$ or —OH, that intensifies the color of a chromophore, develops a color from a chromogen, or enhances the shade of a compound toward the violet, as > CO Cf *bathochrome*

auxogluc. Any atom or radical which combined with glucophores yields compounds of sweet taste; examples —H, —CH_2OH and the lower alkyls.

auxograph. A device for recording the rate of growth of plants.

auxotox radical. The methylimine group = $N.CH_3$. It causes degeneration of the liver when a drug containing it is administered.

av. Avoirdupois.

ava. Kava.

available. That which can be utilized; **a. acidity.** Hydrogen ion concentration; **a. nitrogen.** The soluble N of fertilizers.

avalite. A clay-like silicate containing chromium.

Avena. A genus of grasses which yield important cereals; as, *A. sativa* (common oat).

avenalin. A globulin from oats.

avenin. Legumin. A protein from *Avena sativa*, oats, probably identical with gluten casein. A yellowish powder, used medicinally as a general stimulant and tonic.

avenine. $C_{56}H_{21}O_{18}N$ = 995.4. An alkaloid from oats, used as a nerve stimulant.

aventurine. (1) A brown glass with imbedded brass filings which is made in Venice. (2) A variety of feldspar containing iron. **a. quartz.** A variety of quartz from the Ural Mountains, which contains mica. Cf. *imperial* jade.

avenyl. 2-Myristo-oxy-mercury-3-oxy-benzaldehyde. A constituent of hydnocarpus oil, used for leprosy.

average. Mean.

avertin. $C_2H_3Br_3O$ = 282.77. Bromatol, tribromoethanol, ethobrome, CBr_3CH_2OH. Colorless crystals, m.80, $b._{11mm}$94; used as rectal anesthetic.

Avicenna. 980–1037. Abu Ali en Hosein Ben Abdallah. A Persian mathematician and alchemist noted for his writings, which were translated into Latin.

avidin. A constituent of egg-white, which inactivates the biotin present and so injures the white.

Amadeo Avogadro.

(From Brownlee, Fuller and Hancock "Elementary Chemistry." Courtesy of Allyn & Bacon.)

avidity. An obsolete term for *affinity* or *activity*.

avitaminosis. A deficiency disease due to lack of a vitamin in the diet; as, beriberi and scurvy. Cf. *hypovitaminosis*.

avocado. The fruit of *Persea gratissima*, avocado or alligator pear, which is used as a delicacy in the United States, but as a staple food in Latin America. The seed yields a black, indelible ink. **a. oil.** An oil expressed from a. It contains vitamins A, D and E, phytosterol and lecithin; used as skin food and emollient. **a. sugar.** A mannoketoheptose isolated from avocado. Cf. *sugars*.

Avogadro, Amadeo (Conte di Quaregna). 1776–1856. An Italian chemist and physicist, who formulated the **gas laws. A. constant.** A. number. **A. hypothesis.** A. law. **A. law.** Equal volumes of all gases contain at the same pressure and temperature, the same number of molecules. **A. number.** A. constant, N. The number of molecules contained in one mole (gram-molecule).

$$N = (6.062 \pm 0.006) \times 10^{23}$$

Values of $N \times 10^{23}$ determined by various methods are:

kinetic theory (*Loschmidt*, 1865)	5.95–6.8
atmospheric diffusion (*Lord Rayleigh*, 1899)	6.04–6.4
heat radiation (*Planck*, 1900)	6.05
fog droplets (*J. J. Thomson*, 1903)	6.062
α-particle count (*Regener*, 1908)	6.04
Brownian motion (*Perrin*, 1909)	6.09
spectral line structure (*Sommerfeld*, 1916)	6.08

A. theory. A. law.

avoirdupois. The English system of weights and measures. See *weights*.

axerophtol. $C_{20}H_{29}.OH$ = 286.2. Vitamin A alcohol. The alcohol of which vitamin A is the fatty acid ester; it is the hydrolysis product of B-carotene.

axestone. A hard variety of jade found in Cornwall.

axinite. The plum-colored mineral $H_2(Ca,Fe,Mn)_4(BO)_2Al_2(SiO_4)_5$.

A. W. Abbreviation for atomic weight.

awaruite. A native nickel-iron containing 67 % Ni and 31 % Fe.

Awn hygrometer. An instrument that indicates the loss of moisture from a leaf surface.

axial. Pertaining to an axis. **a. angle apparatus.** Goniometer. **a. symmetry.** The trans-form of an organic compound: *e.g.*, fumaric acid. See *stereoisomerism*.

axin. A varnish-like fat from the Mexican cochineal (*Lacus axinus*), containing lauric and axinic acids; used as a vulnerary and as varnish.

axinic acid. $C_{18}H_{33}O_2$ = 276.3. A brown, oily acid from axin.

axinite. A native, brown, transparent, aluminum borosilicate containing Ca, Mn, Fe. It is sometimes used as a gem.

axiom. A self-evident proposition that requires no proof. Cf. *postulate*.

axis. A line, imaginary or real, passing through an object, around which all parts of the object may be arranged symmetrically. Cf. *coordinate*, *crystal* system, *pinakoids*. **electric-** The direction of a crystal which offers least resistance to the passage of an electric current. **principal-** see *principal*. **optic-** An imaginary line passing

through the center of any system of lenses **x-, y-, z-** See *coordinates*

axonometry Measurement of the axes in crystals and minerals

Az The French symbol for nitrogen (azote)

aza- See *tetra-arylaza*

azacyclo- A prefix indicating the presence of an NH group in a saturated carbon ring, as **a hexadecanine** $NH(CH_2)_{15}CH_2$

azadarach Azadarichta, margosa bark, neem bark The bark of the Indian lilac tree or bead tree, *Melia azadarichta*, a Meliaceae of Asia It contains margosine, margosinic acid and neem oil, used as an anthelmintic, purgative and emetic

azaleine Fuchsin

azarin $C_{16}H_{17}O_4N_3S$ = 347 3 A nonpoisonous, bright red aniline dye for cotton

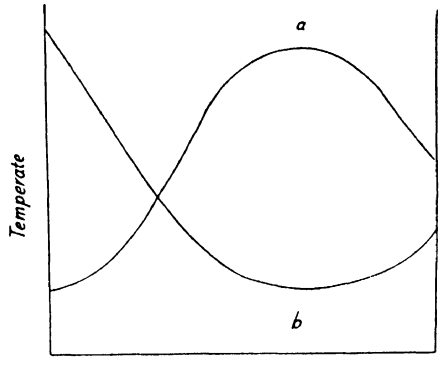
azafrin $C_{28}H_{40}O_4$ = 440 28 A carotenoid pigment, m 212, from the roots of azafranilla, *Escobedia scrabifolia*, a Scrophulariaceae of tropical America

azedarine An alkaloid from the roots of *Melia azedarach*, an Asiatic tree See *margosine*

azelaic acid $C_9H_{16}O_4$ = 188 17 Anchoic acid, lepargylic acid 1 7 -heptane dicarboxylic acid, nonanedioic acid, $HOOC(CH_2)_7COOH$ An oxidation product of oleic acid Colorless crystals or leaflets, m 106, b 360, soluble in water, alcohol, or ether **a acid value** A chemical constant used in the analysis of fats, a measure of the potassium salts of the azelaic glycerides formed

azelain The glyceride of azelaic acid

azeotropes Any one of two or more compounds which form mixtures of constant boiling point, as, 0 6 mole carbon disulfide and 0 4 mole acetone **negative-** A with minimum boiling mixtures, as benzene-methanol or carbontetrachloride-methanol **positive-** A with maximum boiling mixtures as, chloroform-acetone or chloroform-methylacetate



Concentration

Azeotropes

a—positive azeotrope of A and B
b—negative azeotrope of A and B

azeotropy The property of certain liquid mixtures of constant boiling-points to yield distillates having the same composition as the original mixture, Cf *hylotropy*

azerins The digestive enzymes of insectiverous plants, as the enzyme of *Drosera rotundifolia*

azete C_3H_3N = 53 1 The heterocyclic compound $CH{=}N{-}CH{=}CH$ **dihydro-** Azetine **tetrahydro-** Azetidine.

azetine C_3H_5N = 55 1 Dihydroazete The heterocyclic compound $CH_2{-}NH{-}CH{=}CH$

azide (1) A compound containing the monovalent $-N_3$ group, as benzyl a , silver a (2) Triazo **oxy-** Oxyazide

azidinblue Trypan blue

azido Triazo

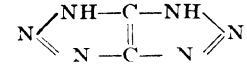
aziethane Diazoethane

aziethylene Diazoethane

azimethane Diazomethane

azimethylene Diazomethane

azimid $C_2H_2N_6$ = 110 08 Osotriazol The heterocyclic compound



azimide Benzoylazide

azimido Azimino The bivalent $=HN_3$ group, —NH N N— **a benzene** Benzotriazole

azimino Azimido

azimuth The angle between the meridian and the vertical plane through an object, as, the angle of a star above the horizon Cf *coordinates*

azine Pyridine

azino The tetravalent radical =N N= **a dyes** Dyes containing the azo group

azirane Ethylenimine

azo- A prefix which indicates the presence of the divalent radical —N N—, derived from the French azote, nitrogen **a color** A colored compound containing the azo group, as, methyl orange, congo red, bismarck brown **a compound** An organic compound containing the —N N— radical, as azo-benzene **a group** The divalent —N N— radical Cf *azino, diazo, triazo, tetrazo, hydrazo, oxyazo*

Azobacter A group of aerobic bacteria of the soil that oxidize the nitrogen of the atmosphere See *azotobacter*

azobenzene $C_{12}H_{10}N_2$ = 182 08 Azobenzide azobenzol, azophenylenbenzene, benzene azobenzene, nitrogen benzide, diphenyldiimide PhN NPh Orange leaflets, d 1 203 m 68 b 297 4, insoluble in water, soluble in alcohol or ether Used in organic synthesis **p-amino-** $C_{12}H_9N_2NH_2$ = 197 2 Phenylazoaniline, benzene azoaniline **o-** or **2-** Golden crystals, m 123, b 360 Its hydrochloride is spirit yellow (aniline yellow) **m-** or **3-** Orange needles, m 57 **p-** or **4-** Yellow monoclinic crystals, m 126 **p-diamino-** $C_{12}H_8N_2(NH_2)_2$ = 212 2 Colorless crystals, m 241, used in organic synthesis The hydrochloride is chrysoidine **dihydroxy-** Azophenol **dimethyl-** Azotoluene **diphenyl-** *Coupier's* blue **hydroxy-** See *benzene*

azobenzide Azobenzene

azobenzil $C_{14}H_{10}ON_2$ = 222 2 Ph CO C(N_2)-Ph

azobenzoic acid (N $C_6H_4COOH)_2$ = 270 23 Azobenzenedicarboxylic acid **o-** Dark yellow needles, decomp 237, sparingly soluble in water, soluble in alcohol or ether **m-** Amorphous powder decomp on heating, soluble in water, alcohol or ether **p-** A red amorphous powder, decomp on heating, insoluble in water, alcohol or ether

azobenzol Azobenzene

azoblue A blue azo color for cotton, wool or silk

azochloramid *N N*-Dichloro azodicarbonamidine A bactericide and antiseptic, soluble in water

azocyanide A compound containing the monovalent —N N CN radical, *e g*, benzene azocyanide, $C_6H_5N_2CN$

azodermine Acetyl-amidoazo-toluene A reddish powder that stimulates epithelial growth

azodicarbonamide $C_2H_4O_2N_4$ = 116 08 Azoformamide The compound, NH_2 CO N_2 CO-NH_2 soluble in water, insoluble in alcohol, decomp 180

azodicarbon-diamidine $NH_2C(NH)$ N N C-(NH) NH_2 = 114 11 **hydr-** $NH_2C(NH)NH$-NH(NH)C NH_2 = 116 03

azodiphenyl *Coupier s* blue

azo-dyes A large group of organic synthetic coloring materials derived from azobenzene

azofication *Nitrogen* fixation

azoflavin Azoacid yellow, Indian yellow A mixture of nitrated diphenylamine orange and nitrodiphenylamine A brownish-yellow powder, soluble in hot water Used as a dye for wool and silk

azoformamide Azodicarbonamide, NH_2CO N-N CO NH_2

azoformic acid C_2H O_4N_2 = 118 1 Azodicarbonic acid, COOH N N COOH

azoic An obsolete term for the earliest geological (Pre-Cambrian) formations

azoimide Hydrazoic acid **methyl-** Methylenimine

azoisobutyronitrile $C_8H_{12}N_4$ = 164 2 CN-CMe_2 N N CMe_2 CN Colorless crystals, m 105

azole Pyrrole

azoles A group of pentatomic heterocyclic ring compounds, *e g*, pyrrole, furfurane, isoxazole, oxazole, diazoles

azolitmin $C_7H_7O_4N$ = 169 1 The coloring matter of litmus Dark violet scales, soluble in water insoluble in alcohol, and very soluble in alkalis, is used as an indicator (acids = red, akalis = blue)

azomethin Methylenimine

azonaphthalene $C_{10}H$ N N $C_{10}H_7$ = 282 30 Naphthyldiimide *α-* or **1 1′-**Red needles, m 190, insoluble in water, slightly soluble in alcohol, soluble in benzene *β-* or **2 2′-** m 204 *αβ-* or **1 2′-** m 136

azonium A compound of the type R_3N_2X, as ethyl methyl phenyl azonium chloride

azophenetole $C_{16}H_{18}O_2N_2$ = 270 16 Diethoxyazobenzene $(C_6H_4OEt)_2N_2$ **ortho-** m 131, decomp at 240, insoluble in water, soluble in alcohol, ether or chloroform **para-** m 167 Insoluble in water or alcohol, soluble in ether

azophenol $C_{12}H_{10}O_2N_2$ = 214 22 Dihydroxyazobenzene, azodiphenol The compound HO-C_6H_4 N N C_6H_4 OH **o-** or 2 2′ dihydroxyazobenzene Yellow leaflets, m 171 (sublimes), insoluble in water, slightly soluble in alcohol or ether **m-** or 3 3′-dihydroxyazobenzene Brown scales, m 205, sparingly soluble in water, soluble in alcohol **p-** or 4 4′-dihydroxyazobenzene Brown, triclinic crystals, decomp 216, slightly soluble in water, soluble in alcohol or ether The azophenols are intermediates in the manufacture of dyes

azophenyl The monovalent PhN N-group Cf *phenylazo, oxyazo* compounds **a ethane** C_8H_9-N_2 = 133 2 Benzene azoethane, PhN NEt A colorless liquid, b 280 **a methane** $C_7H_7N_3$ = 119 2 Benzene azomethane PhN NMe A colorless liquid, b 150

azophenylene Phenazine

azophosphin A yellow azo-dye, $C_6H_3(OH)_2$ N-N C_6H_4 NMe_2Cl

azorite $ZrSiO_4$ A native zirconium silicate

azosulfime 1 2 4-Thiodiazole

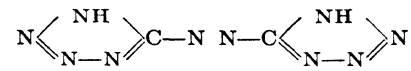
azosulfine Thiodiazole

azosulfonic acid A compound containing the monovalent —N N SO_3H radical, as, Ph N_2-SO_3H— benzene azosulfonic acid

azotate Nitrate

azote French for nitrogen, Az

azotetrazole $C_2H_2N_{10}$ = 166 12 The heterocyclic compound



azotic acid Nitric acid

azotized (1) Nitrogenous (2) Nitrogenized or changed to an azo-compound

azotobacter A group of soil bacteria, as, chroococcum, which convert atmospheric nitrogen to nitrates Cf *azobacter*

azotoluene $C_{14}H_{14}N_2$ = 210 27 Dimethylazobenzene, tolulazotoluene, ditolyldiimide, MeC_6-H_4N N C_6H_4Me **oo-** or **2 2′-** Red prisms, m 55, insoluble in water, sparingly soluble in alcohol, soluble in ether **mm-** or **3 3′-** Orange colored, rhombic crystals, m 54, insoluble in water, soluble in alcohol or ether **pp-** or **4 4′-** Yellow needles, m 114, insoluble in water, soluble in alcohol or ether **amino-** Aminoazotoluene **diacetylamino-** Dimazon **diamino-** See *diamino*

azotometer An apparatus for determining the nitrogen content of compounds in solution gasometrically

azoxazole Furazan

azoxime 1 2 4-Oxdiazole

azoxy Divalent —NON— radical

azoxyanisole $C_{14}H_{14}O_3N_2$ = 258 20 p(MeO-$C_6H_4N)_2O$ White crystals, m 117, soluble in alcohol

azoxybenzene $C_{12}H_{10}ON_2$ = 198 22 Zinin, azoxybenzide The compound Ph NON Ph Yellow needles, d 1 248, m 36, decomp on further heating, insoluble in water, soluble in alcohol or ether

azoxybenzoic acid $C_{14}H_{10}O_5N_2$ = 286 23 Azoxydibenzoic acid, azoxybenzenedicarboxylic acid The compound $(C_6H_4COOH)_2NON$ **o-** or 1 1′- Pale yellow leaflets, m 248, decomp on further heating, sparingly soluble in water, alcohol, or ether **m-** or 2 2′- Pale yellow needles, decomp 320, insoluble in water, slightly soluble in alcohol, or ether **p-** or 3 3′- A yellow amorphous powder, decomp 240, insoluble in alcohol, water, or ether

azoxynaphthalene $C_{10}H_7$ NON $C_{10}H_7$ = 298 23 Azoxydinaphthalene **1 1′** or **alpha-** Red rhombic crystals, m 127, insoluble in water, soluble in alcohol or concentrated H_2SO_4 **2 2′** or **beta-** m 167, insoluble in water

azoxytoluidine Diaminoazotoluene

azulene $C_{16}H_{26}O$ = 234 3 The blue coloring matter of chamomile, wormwood, and other essential oils, see also *cerulein* An oily liquid, d 0 987, b 170, insoluble in water It is a dehydrogenated azulogen

azulin A blue aniline dye formed by heating aniline with corallin

azulmic acid Azulmin

azulmin $C_4H_5ON_5 = 139.2$ A dark brown compound formed by the decomposition of cyanogen

azulogens A group of sesquiterpenes occurring in many essential oils They give a blue color with bromine in chloroform, owing to the formation of azulene

azurine (1) Theobromine sodium acetate, used medicinally as a diuretic (2) A bluish-black aniline dye

azurite $Cu_3H_2C_2O_8$ or $CuCO_3 Cu(OH)$ Chessylite, lazulite, lapis lazuli Native copper carbonate Blue malachite, an azure blue monoclinic mineral formerly used as a gem, now in paints and in ceramics Cf *malachite*

azur malachite A bluish-green malachite from Arizona

azylase A diastatic enzyme which degrades the amides of substituted acids, but does not attack true peptides

azymic (1) A reaction not caused by fermentation (2) Describing an enzyme that does not cause fermentation

azymous Unfermented

B

B The symbol for boron

°B The symbol for degree of density on the *Beaume* scale (q v)

b An abbreviation for "boils at" b_{15mm} x Boils at x°C under 15 mm pressure

b A constant of van der Waal's equation the co-volume or volume occupied by the molecules See *equation* of state

β The Greek letter "beta " (1) A symbol for the specific heat constant (2) In chemical names substitution at the *second* carbon atom, or that following the α-carbon atom See *beta*-position *β* **acid** Anthraquinone-2-sulfonic acid *β* **particle** See *beta β* **position** See *beta β* **rays** See *beta*

b p Abbreviation for boiling point

B t u Abbreviation for British thermal unit (American usage) See *B Th U*

B T U Abbreviation for Board of Trade unit (British usage)

B Th U Abbreviation for British thermal unit (British usage)

Ba The symbol for barium

bababudanite $4NaFe(SiO_3)_2\ 2FeSiO_3\ 3MgSiO_3$ A soda amphibole from Mysore (India)

babassu oil An oil from the fruit kernel of the Brazilian palm tree, *Orbignya martiana*, a Palmae It resembles coconut oil

babbitt Babbitt metal An alloy of about 65–95 pts tin, 8–12 pts antimony, and 1 pt copper, used for bearings

Babcock, Stephen Moulton 1843–1931 An American chemist noted for work on milk analysis **b bottle** A graduated glass flask used for the determination of fat in milk **B milk tester** A centrifuge used in milk-fat analysis **B pipet** A pipet which delivers 17 6 cc in 5 to 8 seconds at 20°C, used in milk analysis

babingtonite A native pyroxene, $(Ca,Fe,Mn)_6Fe_2Si_{10}O_{27}$, which occurs in vitreous, greenish-black, triclinic masses

babitt Babbitt

Babo, Clement Heinrich Lambert Freiherr von 1818– A German chemist who determined the vapor pressure of water (1847) **B absorption tube** A glass cylinder filled with glass beads, used for the absorption of gases by liquids **B's law** The relative lowering of the vapor pressure of a solvent, due to a substance in solution, is the same at all temperatures

babool An East Indian name for *Acacia arabica* Its bark is used for tanning, and its gum is *gum arabic*

babul Babool

bacca Latin for berry

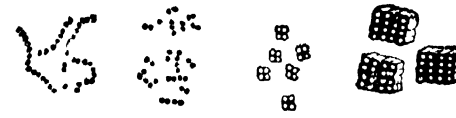
baccarine An alkaloid from mio-mio, *Baccharis cordifolia*, a Compositae of South America

bacciform Berry-shaped

Bachoune, Arnold 1235–1315 Villanovanus A French alchemist who noted the dangers of putrefaction and of copper utensils in cooking, author of twenty books

bacillus A rod-shaped bacterium, a genus of Bacteriaceae Cf *bulgara, lactobacillus, ropiness, syncyanin, tetanus*

Bacon, Roger 1214–1294 An English alchemist and mathematician who wrote about gunpowder and the extinction of fire by removal of air **B , Francis** [Baron Verulam, 1561–1626] An English philosopher and exponent of the inductive method in science



Streptococci Diplococci Tetrads Sarcinæ
Round Bacteria—cocci

Rod-shaped bacteria—bacilli

Spiral-shaped bacteria—spirillae

bacteria (Sing bacterium) A group of small, microscopical unicellular plants (Schizomycetes) belonging to the fungi They contain 8–15 % proteins, 0 5–4 % fats 0 5–3 % ash, and 80–85 % water **acetic acid-** Bacillus aceti A b that oxidizes alcohol to acetic acid **ammonifying-** A soil b which reduces N to ammonia **butyric acid-** Bacillus butyricus A b found in milk, water, dust, etc that produces butyric acid from fats **chromogenic-** A b producing colored products **denitrifying-** A soil b that oxidizes ammonia to nitrogen **lactic acid-** A b occurring in air and sour milk that produces lactic acid **nitrifying-** A soil b that oxidizes N to nitrites and nitrates **photo-** A b that causes phosphorescence, as in decaying fish or wood **soil-** B essential for plant growth

b 'grinder A device for powderizing bacteria, used in making vaccines and toxins **b membrane** A scum or pellicle, which consists of bacteria Cf *bacterial* membrane

GROUP NUMBERS OF BACTERIA

100	Endospores produced
200	Endospores not produced
10	Aerobic (strictly)
20	Facultative anaerobic
30	Anaerobic (strictly)
1	Gelatin liquefied
2	Gelatin not liquefied
1	Acid and gas from dextrose
2	Acid without gas from dextrose

3	No acid from dextrose
4	No growth with dextrose
01	Acid and gas from lactose
02	Acid without gas from lactose
03	No acid from lactose
04	No growth with lactose
001	Acid and gas from saccharose
002	Acid without gas from saccharose
003	No acid from saccharose
004	No growth with saccharose
0001	Nitrates reduced with evolution of gas
0002	Nitrates not reduced
0003	Nitrates reduced without gas formation
00001	Fluorescent
00002	Violet chromogens
00003	Blue chromogens
00004	Green chromogens
00005	Yellow chromogens
00006	Orange chromogens
00007	Red chromogens
00008	Brown chromogens
00009	Pink chromogens
00000	Non-chromogenic
000001	Diastasic action on potato starch strong
000002	Diastasic action on potato starch feeble
000003	Diastasic action on potato starch absent
0000001	Acid and gas from glycerin
0000002	Acid without gas from glycerin
0000003	No acid from glycerin
0000004	No growth with glycerin

E g the group number of *Bacillus coli* (Esch) is 222 111102, which means that the bacillus produces no endospores, is facultative anaerobic, does not liquefy gelatin, develops acid and gas from dextrose, lactose, saccharose, reduces nitrates with evolution of gas, is non-chromogenic, and has a feeble diastasic action on potato starch

Bacteriaceae A family of plants (Schizomycetes), which consists of unicellular organisms Cf *bacteria*

bacterial Pertaining to bacteria **b action** The effect of bacteria or their metabolism on proteins, *e g*, hydrolizing, deaminizing, decarboxylating, toxin-forming, etc **b decomposition** See *bacterial action* **b forms** The shapes of bacteria, *e g* round, short rods long rods, short chains, long chains, filaments, "commas," short spirals, long spirals, clostridium, cuneate, clavate, curved, etc (see figure) **b membrane** The cell wall of a bacterium Cf *bacteria* membrane **b poisons** See *poison, e g*, food poisons, ptomaines, toxins, septic poisons **b precipitation** (1) Precipitins (2) Deposition of inorganic salts (*e g* calcium carbonate) caused by the action of bacteria

bactericide An agent that destroys or kills bacteria

bactericidin An antibody of the blood serum, which kills bacteria

bacterin Bacterial vaccine A sterile suspension of dead pathogenic bacteria in physiological salt solution Usually standardized in terms of a definite number of bacteria per cubic centimeter, used for hypodermic medication, to produce active immunity by stimulating the production of specific antibodies

bacteriofluorescin Fluorescent coloring matters produced by some bacteria

bacteriological Pertaining to bacteriology **b fermentation tube** A U-shaped glass tube for bacteriological work, with a closed arm for the collection of carbon dioxide or other gases formed by the action of certain types of bacteria **b filter apparatus** A device for filtering solutions that contain bacteria, thus rendering the solution sterile See *Berkefeld* f **b incubator** A closet which can be kept at a definite temperature, in which the cultures of bacteria are grown

bacteriology The science dealing with bacteria, their identification, culture and properties

bacteriolysin An antibody formed in the blood, which promotes the disintegration and dissolution of bacteria

bacteriolysis The destruction of bacteria by dissolution

bacteriophage An ultramicroscopic, transmissible, filter-passing and lytic agent of bacteria, the exact nature of which is undetermined Their action is specific and bacteriolytic, used therapeutically

bacteriophagy (1) The experimental study of ultramicroscopic organisms (2) The application of bacteriophages to the treatment of disease

bacteriopurpurin A purple coloring matter produced by bacteria, *e g*, *Beggiatoa roseopersicina*

bacteriostatic Inhibiting the growth of bacteria

bacterium Latin (sing) for bacteria **b aceti** B causing acetic acid fermentation **b lactis** B causing lactic acid fermentation

baddeckite A muscovite containing ferric iron

baddeleyite ZrO_2 Brazilite A native zirconium oxide of Ceylon and Brazil

baden acid 2 8 -Naphthylamine sulfonic acid

badische acid 2 8-Naphthylamine sulfonic acid

Badouin's reagent See *Baudouin*

Baekeland, Leo Hendrik 1863– A Belgian-born American chemist noted for development of synthetic resins (bakelite) and photographic processes

bael Bengal quince, Indian bel The fresh unripe fruit of *Aegle marmelos*, a Rutaceae, used as specific for diarrhea and dysentery

baeumlerite $KCl\ CaCl_2$ A native calcium-potassium chloride from Germany

Baeyer, J F W Adolf von 1835–1917 A German chemist and pioneer in the organic synthesis of arsenicals, indigo, pyridine bases, phthaleins, and other compounds **B acid** *Bayer* acid **B Strain Theory** A theory which explains the relative stabilities of penta- and hexamethylene ring compounds in terms of the angles between the carbon atom valencies

baffle An obstruction in the path of a gas, fluid, sound, etc

bagasscocis, bagassosis A respiratory disease produced by the dust from dried bagasse used for board manufacture

bagasse The dried sugar-cane from which the juice has been extracted, used as a fuel, fertilizer, and for paper pulp **b cutter** A revolving knife used for cutting bagasse and other dried material **b fiber** A by-product of sugar manufacture, used for wallboards (as, celotex), or as a source of cellulose

bagrationite Allanite

bahama white wood Canella

Bahia arrowroot Tapioca

baicalein $C_{15}H_{10}O_5 = 270\ 08$ *5,6,7*-Trihydroxyflavone A flavone from baicalin

baicalin A glucoside from the roots of *Scutellaria baicalensis*, a Labiatae, it yields glycuronic acid and baicalein

Baier thermometer A special thermometer for refractometers

baikalite Diopside A silicate of calcium and magnesium, $MgO,CaO,2SiO_2$

Bailey crucible holder A rubber ring for holding a Gooch crucible in a funnel

Bailey-Walker extraction apparatus A glass flask, metal condenser, and glass syphon for continuous extraction

Bain washing apparatus A device of washing microscopic specimens

baits Chemicals used in traps to catch insects *e g*, geraniol for Japanese beetle, and methyl cinnamate for fruit moth

bakelite A synthetic resin obtained by the condensation of formaldehyde with phenols Used as plastic for insulation and lacquers, also as a substitute for vulcanite Cf *Backeland*

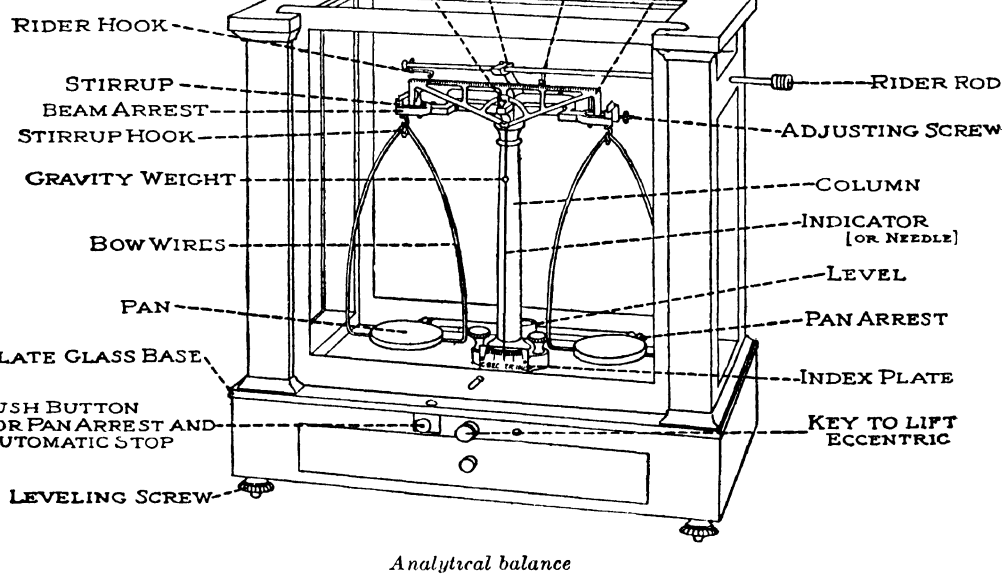
Baker, Herbert Brereton 1862–1935 An English chemist noted as an educationalist, and for his work on the effect of intensive drying on chemical reactions

bakerite $8CaO\ 5B_2O_3\ 6SiO_2$ A native calcium boro-silicate found in the Mohave Desert

baking powder A powder containing sodium bicarbonate and tartaric acid (or other acid), with starch as a filler, used as a substitute for yeast in the production of carbon dioxide in bread-making **b soda** *Sodium* bicarbonate

balaban The hydrocarbon of chicle

balance (1) A device for weighing (2) The harmonious adjustment of related parts, as *nitrogen* balance **alloy-** A b adapted for metallurgical laboratories **analytical-** A pair of highly-sensitive scales, used for quantitative analysis, sensitiveness, 0 1–0 01 mg **assay-** An analytical b for metallurgical work **chain-** A b in which the effects of weights of 100 mg or less are produced by altering the length of a fine metal chain hanging from one of the beams, this length being measured by a pointer on a calibrated vertical scale **chainomatic-** q v **chemical-** Analytical b **cloth testing-** A specially constructed torsion b for weighing textiles **counter-** A b of average sensitiveness **cream test-** A torsion b adapted for milk testing **coin-** A sensitive b used in mints **damped-** A b in which the equilibrium position is rapidly attained as a result of the damping action of a piston which fits closely and slides in a cylinder **decimal-** An analytical b designed for industrial laboratories where a large number of consecutive equal weighings are made **dispensing-** A small b for prescription work **gas-** A device for determining the specific gravity of gases **hand-** A polished brass beam with silk cords and horn pans **Jolly spiral spring-** A torsion b for industrial laboratories **lecture table-** A large b for lecture experiments **magnalium-** A b made of magnalium **micro-** A highly sensitive b for weighing small quantities, *e g*, as indicated by the torsion of a quartz fibre, sensitiveness ranges from 0 001–0 000004 mg **mohr-** A b for measuring specific gravities of solids, similar to a Westphal b **moisture-** A pair of scales for determining the moisture in ores and other samples The b-beam is divided into moisture percentages **prescription-** A sensitive beam b used in pharmaceutical laboratories **projection-** A b in which the movement of the beam pointer is magnified by means of an optical projector **pulp-** A large beam b mounted on a marble top for use in industrial laboratories **soil-** A torsion b used in soil analysis **specific gravity-** Westphal b **spring-** A pan suspended by a vertical coil of wire in a metal case with a pointer scale to indicate the strain on the pan **torsion-** A balance which measures the twisting force



Analytical balance
(Popoff, "Quantitative Analysis")

necessary to turn a suspension thread or wire through a given angle. **transpiration-** A sensitive beam b. for measuring transpiration. **Westphal-** See *Westphal.*

b. cover. A rubber sheet for protecting balances. **b. pans.** Pairs of counterpoised watch glasses with handles for weighing powders. **b. reading glass.** A lens for reading the scale of an analytical b. **b. rest.** A glass or metal block for supporting b. pans. **b. rider.** A small platinum wire which is bent U-shaped with a hook, usually weighing 1 mg., and sliding along the beam of analytical b. **b. weights.** A set of accurately standardized weights which are either brass or aluminum, nickel-plated or gold-plated.

balanced. In a state of equilibrium. **b. reaction.** A reaction which can be made to proceed in either direction by variation of either temperature, pressure or concentration of the reactants. Cf. *equilibrium.*

Balard, Antoine Jerôme. 1802–1876. A French chemist, who discovered bromine (1826) and the nature of bleaching powder.

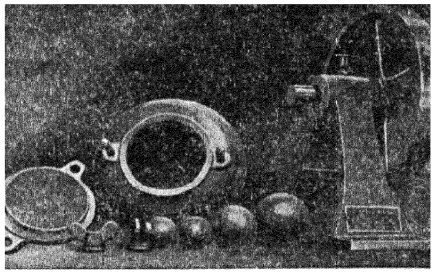
balas ruby. Spinel. Cf. *ballas.*

balata. (1) The dried juice of *Mimusops globosa,* a Spotaceae, a tree of the West Indies. Used for insulating as a substitute for guttapercha, and coated on canvas for driving-belts. Cf. *chicle.* (2) The hard dense, heart-wood of the bully tree, *Bumelia retusa,* a Sapotaceae.

baleen. *Whale* bone.

ball clay. A white or light cream burning clay of high plasticity, originally mined in balls of 30–35 lb. **b. mill.** A spherical container with balls of iron or quartz for grinding materials to a fine powder.

ball mill. A bowl of metal or porcelain containing metal balls of various sizes, which are used to crush materials. See figure. Cf. *pebble* mill.



Ball mill.

ballas. A variety of diamond intermediate between carbons and diamond. Cf. *balas.*

Balling, Carl Joseph Napoleon. A German professor noted for his work in fermentation chemistry. **B. degree.** A specific gravity scale. (1) x° Balling is equivalent to a specific gravity of $\frac{200}{200 \pm x}$ at 17.5°C. x is + or − according as the liquid is heavier or lighter than water, respectively. (2) Brix degree. See *hydrometers.*

ballistic galvanometer. A device which indicates small or intermittent currents. It depends on the accumulation of a charge of static electricity, which is suddenly released from a condenser to deflect a needle to an extent which is proportional to the amount of electricity present.

ballistite. A gelatinized nitroglycerin and nitrocellulose, used in smokeless powders.

balloelectric. Pertaining to the electrical charge of an atomized spray of a liquid.

ballometer. An instrument for measuring the electric charges conveyed by an atomized spray. It consists essentially of a metal plate connected to a quadrant electrometer.

balloons. See *gas* balloons.

balm. (1) Melissa, (2) Balsam. **bee-** Monarda. **Indian-** Trillium.

b. of Gilead or b. of Mecca. (1) Poplar buds. (2) The exudation of *Commiphera (Balsamodendron) opobalsamum,* a Burseraceae. **b. oil.** Melissa oil, lemon. A yellow essential oil, d.0.89–0.92; soluble in alcohol and obtained from the leaves and flowering tops of *Melissa officinalis.* Used in flavoring extracts.

Balmer formula. The wave-length, λ, and its reciprocal frequency $(1/\lambda)$ or wave-number, ν, of the lines in the hydrogen spectrum can be expressed by $\lambda = 3616.14 \frac{m^2}{m^2 - 4}$ or $\nu = 27{,}418.75 = \frac{109{,}675}{m^2}$, where m is any integer from 3 to 16. **B. series.** A series of lines in the spectrum of hydrogen which are related by $\nu = N(1/n_1^2 - 1/n_2^2)$, and which can be deduced from the quantum theory. The lines are called $H\alpha$, $H\beta$, $H\gamma$ etc. and correspond with an electron transition from an outer to the second orbit. Cf. *energy* levels, *Lyman* series, *Paschen* series, *quantum* number.

balneology. The study of the therapeutic properties of natural waters.

balopticon. Stereopticon.

balsam. A resinous or oleoresinous, fragrant juice or exudate from plants, which consists of a mixture of resins, essential oils, cinnamic and benzoic acid. *E.g.,* Canada b., cative b., cebur b., copaiva, b., fir b., gilead b., gurjun b., lagam b., etc. The U. S. official balsams are Peru balsam, storax and tolu balsam. **b apple.** The fruit of *Momordica balsamina,* a Cucurbitaceae. It contains elaterin. **b. bottle** A wide-necked glass bottle with a loosely fitting cup-shaped cover and glass rod. **b. of Peru** *Peru* balsam. **b. tree.** Mastic.

baltimoriase. A silicate of calcium, aluminum and magnesium from Baltimore County, Md.

baltimorose. A pyroxenite of Baltimore County Md.

Baly, Edwin Charles Cyril. 1871– . An English physicist, noted for spectroscopic and photochemical work. **B. spectrum tube.** A graduated tube in which slides another tube. The intermediate adjustable space is filled with the solution whose absorption spectrum is to be examined.

bamboo. (1) A tropical genus of tree-like grasses with woody, light sectional stems, growing in clumps. (2) The hollow, siliceous, coated stems of bamboo species, used as a building material, for fishing rods. Cf. *tabashis.* **sacred-** *Nandina domestica* of Japan; it yields domesticine and nandinine.

b. oil. Vinifera palm oil. An oil from the fruit of *Gentiliana raphia;* used to soften leather

bambuk. A vegetable butter.

banana. The fruit of *Musa sapientum* (banana plant) which is imported green from the West Indies and Honolulu and ripened in steam heated chambers. Cf. *plantain, pisang* wax. **b. oil.** An alcoholic solution of amyl acetate.

banana-oil Amyl acetate

bancoul nuts The seeds of *Aleurites ambina* from which it expressed a tasteless oil resembling castor oil Cf *tung* oil

Bancroft, Wilder Dwight 1867– An American chemist noted for research on colloids and the phase-rule

band A compact series of spectral lines due to molecules **b head** The wavelength of the sharpest edge of a spectral b **b spectrum** See *spectrum*

bandoline A gummy liquid made from tragacanth and quince seeds, and used for glossing the hair

bandose A quartz-mica-hornblende diorite from Cecil County, Md

Bandrowski's base $C_{18}H_{18}N_4$ = 290 1 Bis-diaminophenyl-*p*-phenylenediamine The compound $(NH_2)_2C_6H_3\,N\,C_6H_4\,N\,C_6H_3(NH_2)_2$, used in organic synthesis

bane A pest or poison, *e g* , dogbane, wolfsbane, etc

Bang method The determination of glucose in urine by titration with alkaline cupric thiocyanate solution Codliver oil

banisterine $C_{13}H_{12}ON_2$ = 212 1 An alkaloid, m 257 from *Banisteria* species, a Malpighiaceae of South America It stimulates respiration and is similar in properties to harmine

Banting, Sir Frederick 1891–1941 A Canadian biochemist, noted for medical research, particularly in connection with the discovery of insulin

baobab A large tree of West Africa, the leaves of which are used in diarrhea, the bark for paper pulp and the fibres of the stem for ropes See *adansonia*

baphin $C_{12}H_{10}O_4$ = 218 08 Colorless crystals, decomp on heating

baptisia Wild indigo The dried roots of *Baptisia tinctoria* (Leguminosae), used as fluid extract as an astringent

baptisin $C_{26}H_{32}O_{14}$ = 540 3 A glucoside, m 240, from the roots of *Baptisia tinctoria* A brownish powder, soluble in alcohol, used as a purgative Cf *rhamnomannoside*

baptisoid The total active principles of baptisia It is a cholagogue laxative, and cathartic

baptitoxine (1) An alkaloid from the root of *Baptisia tinctoria* (2) Cytisine

bar The international unit of pressure Cf *barye* 1 bar = 10^6 dyne/cm ^{2} = 1 013 kg /cm ^{2} = 0 987 atm

bar magnet A magnetized flat rod of iron

baras camphor Borneol

barbados aloes Aloes from Barbados

barbados nuts Purging nuts The poisonous seeds of *Jatropha curcas* (Euphorbiaceae), a native of the West Indies and Brazil See *curcin*

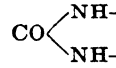
barbaloin $C_{16}H_{18}O_7$ = 322 1 A constituent of Barbados aloes m 148

barbatic acid $C_{19}H_{20}O_7$ = 360 14 A depside from Usnea lichens, especially *Usnea barbata* Colorless prisms m 186

barberry The fruit of *Berberis vulgaris* used for preserves and pickles See *berberis*, *berberine*, *oxyacanthine*

barbierite A soda orthoclase from Norway

barbital $C_8H_{12}O_3N_2$ = 184 1 Diethylbarbituric acid, 2,4,6-trioxy-5-diethyl-pyrimidine, veronal, malonurea, diethyl malonyl urea, barbitone

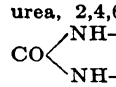


A white crystalline, odorless powder, m 191, soluble in 150 pts cold water, 12 pts hot water, ether or chloroform Used medicinally as a hypnotic **soluble b** B sodium

b sodium. Calmine, veronal sodium, sodium diethyl-barbiturate A white powder, soluble in 5 pts water, used as a hypnotic

barbitone Barbital

barbituric acid $C_4H_4O_3N_2$ = 128 09 Malonyl urea, 2,4,6-trioxypyrimidine, pyrimidinetrione



Colorless rhombic crystals containing $2H_2O$, m 245, decomp 260, slightly soluble in water or alcohol Cf *hydantoin*, *uramil* There are over 100 different 5 5-disubstituted derivatives, among them are

5-allyl-5-isobutyl-	sandoptal
5-allyl-5-isopropyl-	allonal
5-butyl-5-ethyl-	neonal
5 5-diallyl-	dial
5 5-dibromo-	dibromin
5 5-diethyl-	barbital
5 5-dipropyl-	propanal
5-ethyl-5-isoamyl-	amytal
5-ethyl-5-phenyl-	luminal
5-hydroxy-	dialuric acid
5-isonitroso-	violuric acid
5 5-sulfamido-	thionuric acid
5-ethyl-5(1-methylbutyl)-	embutal
5 β-bromoallyl-5 *sec*-butyl-	pernocton

barcenite A native mercury antimonite

Bardach reaction Acetone and iodopotassium iodide give canary yellow needles, (instead of the hexagonal crystals of iodoform) in presence of proteins

bardana Lappa

bardane oil A semi-solid oil from the seeds of burdock, *Arctium lappa*

Bardeen microtome An attachment for carbon dioxide cylinders which facilitates the freezing and cutting of tissues for microscopical examination

Barff boroglycerin A saturated solution of boric acid in glycerin, used for the preservation of animal and vegetable specimens

Barfoed, Christian Theodor 1816–1889 A Danish analytical chemist **B solution** A solution of 13 3 gm cupric acetate in 200 cc dist water and 5 cc 38 % acetic acid **B test** A test for dextrose, (in presence of maltose), which is reduced by B solution

baric An obsolete term for barium in a compound

barilla The fused ash of various plants (seaweeds, glasswort) which consists of sodium carbonate and sulfate It was formerly used in the Mediterranean areas for making soaps, glass, etc Cf *kelp* ash **b de cobre** Nodules of native copper in ores

barite $BaSO_4$ Barytes, cawk, heavy spar A native crystalline barium sulfate, which occurs in snow white crystalline masses, or grayish, reddish, and greenish ores Used in the manufacture of pigments, lithopones and as fillers for paper, inks, etc

barium Ba = 137 36 An element of the calcium family, atomic number, 56 Baryum plutonium A white, soft, metal, d 3 46, m 850, b 950, readily soluble in water, forming barium hydroxide, and readily soluble in acids and

alkalis, insoluble in benzene and hydrocarbons It is found widely-distributed in small quantities in feldspars and micas, and in deposits as sulfate (barytes) and carbonates (witherite), it never occurs native but always in oxy-compounds Barium is divalent and forms only one series of compounds, the soluble compounds are poisonous It was discovered in 1774 by Scheele in barytes, and was isolated in 1808 by Davy Metallic b is not used industrially at present **b acetate** $Ba(C_2H_3O_2)_2 H_2O$ = 273 4 White prisms, d 2 02, decomp on heating, soluble in water or alcohol Used as a reagent for precipitating sulfates and chromates **b aluminate** A white powder, used as water softener for steam boilers **b amylsulfate** $Ba(C_5H_{11}SO_4)_2 2H_2O$ = 507 5 Colorless crystals, soluble in water **b arsenate** $Ba_3(AsO_4)_2$ = 690 1 A black powder, insoluble in water and soluble in acids or ammonium chloride (acid-), $BaHAsO_4 H_2O$ = 295 35 Barium biarsenate Opaque crystalline masses, anhydrous at 150 **b benzoate** $Ba(C_7H_5O_2)_2 2H_2O$ = 415 4 Colorless leaflets, soluble in water **b benzosulfonate** $Ba(C_6H_5SO_3)_2 H_2O$ = 487 1 Colorless crystals, soluble in water or alcohol **b biarsenate** B arsenate (acid) **b bichromate** $BaCr_2O_7$ = 353 57 Red monoclinic prisms, soluble in water (Crystalline) $BaCr_2O_7 2H_2O$ = 389 58 Orange crystalline needles, soluble in dilute acid **b binoxalate** B bioxalate **b binoxide** B peroxide **b bioxalate** $Ba(HC_2O_4)_2 2H_2O$ = 351 4 Barium dioxalate, acid barium oxalate Colorless crystals, sparingly soluble in water **b bioxide** B peroxide **b bisulfate** B sulfate (acid) **b borate** $BaB_2O_4 7H_2O$ = 349 5 A white powder, soluble in water **b boride** BaB_6 = 203 37 Black, regular crystals, d_{15}° 4 36, insoluble in water, soluble in acids **b borotungstate** $2BaO B_2O_3 9WO_3 18H_2O$ = 2788 74 B borowolframate, colorless crystals, soluble in water **b bromate** $Ba(BrO_3)_2(H_2O)$ = 411 2 Monoclinic colorless crystals, d_{17}° 4 04, decomp 260, slightly soluble in alcohol or water **b bromide** $BaBr_2$ = 297 21 Colorless crystals, d 4 781, m 880, soluble in water or alcohol (Cryst) $BaBr_2 2H_2O$ = 333 24 Monoclinic white crystals, d_{24}° 3 852, m 880, soluble in alcohol or water **b butyrate** $Ba(C_4H_7O_2)_2 2H_2O$ = 347 55 A colorless powder, soluble in water **b carbide** BaC_2 = 161 38 Grayish, crystalline masses, d 3 75, decomp by water or acids yielding acetylene **b carbonate** $BaCO_3$ = 197 4 Colorless rhombic crystals or a white powder, d 4 275, m 795, decomp 1450, insoluble in water or alcohol, soluble in acids and ammonium chloride solution It occurs native as witherite Used as a reagent, as rat poison, in water purification, sugar refining, case hardening, manufacture of glass and enamel ware, and in ceramics **b chlorate** $Ba(ClO_3)_2 H_2O$ = 322 3 White monoclinic crystals, d 3 179, m 414, soluble in water or alcohol Used as a reagent, and in pyrotechnics for green fires **b chloride** $BaCl_2 2H_2O$ = 244,32 White rhombic crystals, d_{24}° 3 097, m 960, soluble in water, insoluble in alcohol It is a reagent for the detection and determination of sulfuric acid Used in veterinary medicine, in the manufacture of barium salts, as poison for rats and mice, and for the purification or softening of water **b chloroplatinate** $BaPtCl_6 4H_2O$ = 617 4 Platinic b chloride Red monoclinic crystals, d 2 86, soluble in water, decomp by acids **b chloroplatinite** $BaPtCl_4 3H_2O$ = 528 46 Platinous b chloride Orange-yellow, rhombic crystals, d 2 868, sparingly soluble in water **b chromate** $BaCrO_4$ = 253 5 Yellow ultramarine, lemon yellow Heavy, yellow, rhombic scales, d_{15}° 4 498, insoluble in water, soluble in acids Used as a pigment and in safety matches **b citrate** $Ba_3(C_6H_5O_7)_2 7H_2O$ = 918 23 A colorless powder, soluble in water **b cyanate** $Ba(CNO)_2$ = 221 40 Colorless crystals, sparingly soluble in water **b cyanide** $Ba(CN)_2$ = 189 40 Colorless crystals, soluble in water or alcohol, and used in metallurgy **b cyanoplatinite** $BaPt(CN)_4 4H_2O$ = 508 69 Platinous b cyanide b platino-cyanide Platinum b cyanide Yellowish-green crystals with bluish fluorescence d 3 054 soluble in water, used in X-ray screens **b dichromate** B bichromate **b dioxalate** B bioxalate **b dioxide** B peroxide **b diphenylamine sulfonate** An oxidation-reduction indicator **b diphosphate** See *b phosphates* **b dithionate** $BaS_2O_6 2H_2O$ = 333 52 B hyposulfate White rhombic crystals, d 5 6, soluble in water **b ethylsulfate** $Ba(C_2H_5SO_4)_2 2H_2O$ = 423 5 Colorless crystals, soluble in water or alcohol, and used in organic synthesis **b ferrate** $BaFeO_4$ = 257 4 A purple colored powder, insoluble in water and decomp in acid solutions **b ferrocyanide** $Ba_2Fe(CN)_6 6H_2O$ = 594 77 Yellow prisms slightly soluble in water **b fluobromide** $BaBr_2 BaF_2$ = 472 58 White plates, d 4 96, decomp by water insoluble in alcohol, soluble in HCl **b fluochloride** $BaCl_2 BaF_2$ = 383 66 White plates, d 4 51, decomp by water, insoluble in alcohol soluble in HCl **b fluoiodide** $BaI_2 BaF_2$ = 566 68 Colorless plates, d 5 21 decomp by water, insoluble in alcohol, soluble in acids **b fluoride** BaF_2 = 175 4 A white, heavy, amorphous powder, d 4 828, m 1280, insoluble in water, soluble in acids or ammonium chloride solution It is a strong antiseptic, used for embalming and in enamels **b fluosilicate** $BaSiF_6$ = 279 67 A white powder, d 4 28, insoluble in water or alcohol, slightly soluble in acids or ammonium salt solutions, used as an insecticide in apple orchards **b formate** $Ba(HCOO)_2$ = 227 4 Barium formate Colorless crystals, d 3 21, soluble in water **b hexanitride** $BaN_6 H_2O$ = 239 45 White crystals which explode when heated, soluble in water **b hydrate** B hydroxide **b hydride** BaH_2 = 139 39 White, volatile crystals, d_0° 4 21, m 1200, b 1400, decomp by water **b hydrogen phosphate** B phosphate (acid) **b hydrogen sulfide** B sulfhydrate **b hydroxide** $Ba(OH)_2 8H_2O$ = 315 5 Baria hydride, caustic baryta, hydrated barium Colorless tetragonal crystals, d 1 656, m 78, b 103, soluble in water, alcohol or acids It is a reagent, precipitant and alkaline reagent, used for fusing silicates, saponifying fats, refining vegetable and animal oils, and for neutralizing acids in sugar manufacture **b hydroxide solution** A saturated solution of $Ba(OH)_2$ which contains about 3 5 % barium hydroxide, used as a reagent **b hypophosphate** $Ba_2P_2O_6$ = 432 82 White needles, soluble in water or alcohol **b hypophosphite** $Ba(H_2PO_2)_2 H_2O$ = 285 50 Colorless crystals, d 2 875, soluble in water, decomp when heated **b hyposulfate** B dithionate **b**

hyposulfite B thiosulfate **b iodate** $Ba(IO_3)_2 H_2O$ = 505 2 White crystals, d 5 28, which lose water at 130 and are sparingly soluble in hot water or alcohol, but soluble in acids, decomp when heated **b iodide** $BaI_2 \cdot 2H_2O$ = 427 24 Heavy rhombic crystals, $d_{25°}$ 5 150, m 740, soluble in water or alcohol Used medicinally as an alterant **b lactate** $Ba(C_3H_5O_3)_2$ = 315 5 Colorless crystals, soluble in water or dilute alcohol **b malate** $BaC_4H_4O_5$ = 269 42 A white powder, slightly soluble in water **b malonate** $BaC_3H_2O_4 H_2O$ = 257 42 A white powder, slightly soluble in water **b manganate** $BaMnO_4$ = 256 4 Mangan green, Cassdler green, Rosenstiel green A green powder used as a non-poisonous pigment **b mercuryiodide** See *Rohrbach's* solution **b metasilicate** B silicate **b metatungstate** $BaW_4O_{13} 9H_2O$ = 1243 5 White tetragonal crystals, d 4 298, soluble in water **b methylsulfate** $Ba(CH_3SO_4)_2 2H_2O$ = 401 5 Colorless crystals, soluble in water or alcohol **b minerals** Barium is widely distributed in small quantities in many rocks, feldspars and micas Its principal ores are barite, $BaSO_4$, witherite, $BaCO_3$ **b molybdate** $BaMoO_4$ = 297 4 A white powder, insoluble in water or alcohol, and sparingly soluble in acids **b monophosphate** See *b phosphate* **b monosulfide** B sulfide **b monoxide** B oxide **b nitrate** $Ba(NO_3)_2$ = 261 4 White regular crystals, $d_{23°}$ 3 244, m 575, decomp on further heating, soluble in water, insoluble in alcohol It occurs native as nitrobarite Used as a reagent and precipitant, for standardizing soap solutions and also in pyrotechnics for green lights (*e g*, railroad torches signal rockets, etc) **b nitrite** $Ba(NO_2)_2 H_2O$ = 247 4 Colorless hexagonal needles $d_{29°}$ 3 173, decomp 115, soluble in water, alcohol, acids or alkalis **b oleate** $Ba(C_{18}H_{33}O_2)_2$ = 700 1 Granular white masses, insoluble in water, soluble in alcohol or ether **b oxalate** $Ba(C_2O_4) H_2O$ = 243 4 A white powder, d 2 658, insoluble in water or alcohol, soluble in acids or ammonium chloride solution **b oxide** BaO = 153 4 Baryta b monoxide, b protoxide A white or yellowish amorphous powder or crystals, d 4 73–5 74 m 1923, soluble in water, alcohol or acids Used in the glass industry, and in the manufacture of barium salts **b perchlorate** (1) *anhydrous-* $Ba(ClO_4)_2$ Desiccchlora (2) *tetrahydrate*, $Ba(ClO_4)_2 4H_2O$ = 408 35 Colorless hexagonal crystals, m 505, soluble in water, alcohol or alkalis The anhydrous salt, $Ba(ClO_4)_2$, is used in pyrotechnics **b periodate** $Ba_5(IO_6)_2$ = 1132 6 A white powder, insoluble in water, soluble in acids **b permanganate** $Ba(MnO_4)_2$ = 375 3 Brownish-violet crystals, soluble in water Used in the manufacture of permanganates **b peroxide** BaO_2 = 169 4 B dioxide, b superoxide, b binoxide A white or grayish amorphous powder containing from 89–90 % BaO_2, d 4 958, insoluble in water, decomp in acidulated water with the formation of hydrogen peroxide Used in the manufacture of hydrogen peroxide, and formerly in the preparation of oxygen gas (Brin's method), as a bleaching agent for animal substances and plant fibres, as reagent for the detection of iodine and indican in urine, and in the glass industry (Cryst) $BaO_2 8H_2O$ = 313 45 Colorless crystals, insoluble in water, soluble in acids **b persulfate** $Ba(SO_4)_2$, $4H_2O$ = 401 55 White crystals decomp by water **b phosphate** (di-) $BaHPO_4$ = 233 4 Acid b phosphate B hydrogen phosphate Colorless rhombic needles, $d_{15°}$ 4 165, insoluble in water, soluble in acids or ammonium salt solutions **(mono-)** $BaH_4(PO_4)_2$ = 331 5 Colorless triclinic crystals, $d_4°$ 2 9, decomp by water **(pyro-)** $Ba_2P_2O_7$ = 448 8 White rhombic crystals, $d_{20°}$ 3 9, insoluble in water soluble in acids or ammonium salt solutions **(tri-)** $Ba_3(PO_4)_2$ = 602 2 Colorless crystals d 4 1, insoluble in water, soluble in acids **b phosphide** BaP_2 = 199 4 Grayish masses or powder, decomp by water with the evolution of PH_3 gas **b phosphite** $BaHPO_3 1\frac{1}{2}H_2O$ = 244 4 A colorless powder, soluble in hot water **b platinic chloride** B chloroplatinate **b platinic rhodanate** $BaPt(CNS)_6$ = 680 8 B platin rhodanide, b platinum sulfocyanide, platinic b thiocyanate Red needles soluble in water or alcohol **b platinocyanide** B cyanoplatinite **b platinous chloride** B chloroplatinite **b platinous cyanide** B cyanoplatinite **b potassium chlorate** $BaK(ClO_3)_3$ = 426 8 Colorless crystals, soluble in water, used in pyrotechnics **b propionate** $Ba(C_3H_5O_2)_2 H_2O$ = 301 50 A colorless powder, soluble in water **b protoxide** B oxide **b pyrophosphate** See *b phosphates* (3) **b rhodanate, b rhodanide** B thiocyanate **b salicylate** $Ba(C_7H_5O_3)_2 H_2O$ = 429 6 Colorless needles, soluble in water **b selenate** $BaSeO_4$ = 280 57 A white amorphous powder d 4 75, insoluble in water, decomp by acids **b selenite** $BaSeO_3$ = 264 57 White powder, used in the glass industry as decolorizer and for ruby glass **b silicate** $BaSiO_3$ = 213 67 B metasilicate Colorless, rhombic crystals, $d_{18°}$ 4 44, m 1470, soluble in water or acids **b silicofluoride,** $BaSiF_6$ = 279 5 A white powder d 4 29, slightly soluble in water **b stearate** $Ba(C_{18}H_{35}O_2)$ = 704 12 A white, unctuous mass used as packing material for bearings in pumps handling alkaline solutions **b succinate** $BaC_4H_4O_4$ = 253 5 Colorless crystals, slightly soluble in water, insoluble in alcohol **b sulfate** $BaSO_4$ = 233 4 Artificial barytes, synthetic blanc fix A rhombic microcrystalline powder, d 4 25–4 5, decomp 1580, insoluble in water, alcohol, or dilute acids, but soluble in conc sulfuric acid or ammonium nitrate solution It is a reagent for detecting colloidal metals, a constituent of meals given before taking X-ray pictures of the stomach and intestines, used commercially (as "blanc fixe") as a white pigment, as a body for printing inks, etc and/similarly to barytes Cf *lithopone* **(acid-)** $Ba(HSO_4)_2$ = 331 51 B bisulfate A white powder **b sulfhydrate** $Ba(SH)_2$ = 203 51 B hydrosulfide A yellowish or white powder soluble in water, decomp 250 **b sulfide (mono-)** BaS = 169 4 Colorless rhombic crystals or an amorphous, yellow, phosphorescent powder, $d_{15°}$ 4 25, decomp if heated or by acids, with evolution of H_2S Used as a depilatory and alterant, for the preparation of arsenic-free hydrogen sulfide gas and in making luminous paint, cf *Bologna* phosphorus **(tri-)**, BaS_3 = 233 55 Yellowish-green crystals, soluble in water **(tetra-)** BaS_4 = 265 61 Red rhombic crystals, d 2 987 soluble in water, insoluble in alcohol **b sulfite** $BaSO_3$ = 217 43 A white powder, insoluble in water, soluble in dilute acids **b sulfocyanate, b sulfocyanide**

Same as b thiocyanate **b. sulfophenylate** $Ba(C_6H_5SO_4)_2$ = 483 1 B phenylsulfate White crystals, soluble in water, used as an antiseptic **b sulfovinate** B ethylsulfate **b tannate** A yellowish powder, soluble in water **b tartrate** $BaC_4H_4O_6 H_2O$ = 303 41 White powder, d 2 980, very slightly soluble in water **b tetrasulfide** B sulfide **b thiocyanate** $Ba(CNS)_2 2H_2O$ = 289 55 B thiocyanide, b sulfocyanide Colorless crystals soluble in water or alcohol, used in photography and the dye industry **b thiosulfate** BaS_2O_3 - H_2O = 267 51 A white powder, d 3 447, slightly soluble in water, insoluble in alcohol **b titanate** $BaTiO_3$ = 233 5 A white powder, used in the manufacture of pigments **b triphosphate** See *b phosphates* **b trisulfide** See *b sulfides* **b trithionate** $BaS_3O_6 2H_2O$ = 365 6 Colorless shining scales, soluble in water **b tungstate** $BaWO_4$ = 385 4 B wolframate, tungsten white A white powder, insoluble in water, used as a pigment **b value** The equivalent of the saponification value of an oil or fat, expressed as BaO **b white** B sulfate **b wolframate** B tungstate

bark Any portion of a stem or root of a tree outside the cambium circle The following barks are official (U S P)

Aspidosperma	Mezereum
Cascara sagrada	Pomegranate
Cascarilla	Quillaja
Cassia cinnamon	Rubus
Ceylon cinnamon	Saigon cinnamon
Cinchona	Sassafras
Cotton root bark	Viburnum opulus
Elm	Viburnum prunifolium
Euonymus	White oak
Frangula	Wild cherry
Juglans	Xanthoxylum

barkevite Berkevilite A black amphibole intermediate between hornblende and arfvedsonite, d 3 43

Barkhausen effect The magnetization changes *discontinuously* when the magnetic field-strength acting on a ferromagnetic material is changed

barkometer A hydrometer for tanning liquids, graduated from 0 to 60 degrees Baumé

barley The seeds of *Hordeum distichum*, a cultivated grass **hulled-** B grain deprived of its husk **Indian-** Sabadilla **pearl-** the polished and rounded b seed which is rich in starch but devoid of hordein

b gum A substance consisting mainly of pentosans, isolated from barley or malt

barm A suspension of yeast in a fermenting liquid

barmagnet See *magnet*

barograph A self-registering barometer **b chart** The record produced by a barograph

barometer An apparatus that indicates the air-pressure **aneroid-** A b containing no mercury or other liquid **alcohol-** A b using colored alcohol **Fortin-** A common type of mercury barometer in which the starting-point of the scale is the point of an ivory pin adjusted so as just to touch the surface of the mercury in the cistern **glycerin-** A b utilizing colored glycerin **mercury-** A b using mercury

b tube A narrow tube closed at one end and more than 32 inches (760 mm) long

barometrograph A device for photographing on a moving film the changes in pressure shown by a baroscope

barophoresis Intertraction Diffusion at a speed that is dependent upon extraneous forces such as, density of adjacent phase, gravity etc Thus in agar gels the upward and downward diffusions of methylene blue are unequal

baroscope A U-tube filled with a liquid and connected to the system the pressure changes of which are to be made visible

Barosma A genus of South African evergreen plants of the Rutaceae family **B betulina** The source of *buchu*

barosmin (1) A concentration from *Barosma betulina* or *B crenulata*, used medicinally as a diuretic (2) $C_{27}H_{32}O_{16}$ = 612 2 Rutin, rutoside, eldrin A rhamnoglucoside from buchu, m 183 Cf *sophorin*

barosmoid The total principles from the leaves of *Barosma betulina*, used as a diuretic and stimulant tonic

barotaxis Stimulation of living cells caused by pressure

barotropism The reaction of living cells to changes in pressure

barra Burra gokero

barrandite A native iron phosphate

barrel (1) A unit of weight or volume whose magnitude varies according to the particular commodity for which it is employed, *e g* ,

Wine	31 gallons
Ale	36 gallons
Petroleum	42 gallons
Rosin	180 pounds
Flour	196 pounds
Butter	224 pounds
Pork, Beef	200 pounds
Cement	376 pounds

(2) A cylindrical container of wood- or sheet-metal, for the shipment or storage of large quantities of solids or liquids

barreter lamp An electrical device used to smooth out fluctuating voltages, e g in a mains supply

barringtonin $C_{18}H_{28}O_{10}$ = 404 2 A colorless amorphous glucoside from *Barringtonia speciosa*, a Myrtaceae It is a cardiac poison

baru The seeds of *Hibiscus tiliaceus*, a Malayan Malvaceae, a musk seed substitute

barutin A compound of theobromine and barium sodium salicylate

barye The cgs-unit of pressure, 1 barye = 1 dyne/cm ^{2} Cf *bar*

barylite The native barium silicate, 2BaO, SiO_2

barysilite A native lead silicate, $Pb_3Si_2O_7$, which occurs in white hexagonal crystals

baryta Barium oxide **calcined-** Barium oxide **caustic-** Barium hydroxide **hydrated-** Barium hydroxide **b mixture** One part of saturated $Ba(NO_3)_2$ and two parts of saturated $Ba(OH)_2$ solutions, used in urine analysis **b water** A saturated solution of barium hydroxide (3 5 %), it is alkaline, absorbs CO_2 from air, used as a reagent

barytes Barite

baryto A prefix indicating the presence of barium in a mineral **b calcite** Alstonite

baryum Barium

basalt A compact, black, greenish or brownish igneous rock composed of particles of feldspar, augite and iron minerals Cf *diabase*

basanite A form of jasper used in the streak test for gold Cf *touchstone*

base (1) A compound which yields hydroxyl-ions in aqueous solution, or a compound which reacts with an acid to form water and salt (2) An extension of the term "base" covers substances dissolved in media other than water

WATER SYSTEM (aquo system)

$$Ca^{+}{}^{-}OH + 2H^{+}{}^{-}Cl = H^{+}{}^{-}O + CaCl_2$$

$$K^{+}{}^{-}OH + MeCO\,OH = H^{+}{}^{-}O + MeCO\,OK$$

aquo-base *aquo-acid* *aquo-salt*

AMMONIA SYSTEM

$$Ca^{+}{}^{-}NH_2 + HCl = NH_3 + Ca^{+}{}^{-}NH_2$$

ammono-base *ammono-basic-salt*

$$K^{+}{}^{-}NH_2 + MeCO\,NH_2 = NH_3 + MeCO\,NHK$$

ammono-base *ammono-acid* *ammono-salt*

HYDROCARBON SYSTEM

$$Ca^{+}{}^{-}CH_3 + HCl = CH_4 + Ca^{+}{}^{-}Cl$$

hydrocarbo-base *hydrocarbo-basic-salt*

(3) A proton acceptor, *i e*, a substance whose molecules are capable of taking up protons **ammono-** A metallic amine which yields NH_2^- ion in liquid ammonia **aquo-** A compound that ionizes in water to OH^- ions **hydrocarbo-** Any metallic aryl- or alkyl compound which dissociates in hydrocarbons **inorganic-** The hydroxide of a metal **leuco-** Leucobase **nitrogenous-** An amine, characterized by the ending *-ine* Cf diamine, triamine **organic-** A carbon compound containing trivalent nitrogen **primary-** See primary *amine* Cf *amines, alkaloids, ptomaines* **secondary-** See secondary *amine* **tertiary-** See tertiary *amine*

b exchange The replacement of one cation adsorbed on a colloidal particle (e g soil) by another **b goods** A mixture of fertilizer materials, usually superphosphates and nitrogenous materials **b metal** (1) A metal whose hydroxide is soluble in water (2) A metal which oxidizes rapidly as opposed to a noble metal

basic Having properties of a base **di-** A base having *two*, **mono-** *one*, **tetra-** *four*, **tri-** *three* replaceable hydrogen atoms

b anhydride The oxide of a metal **b capacity** Basicity The property of an acid of yielding one or more hydrogen ions per molecule, hence, the number of hydrogen-atoms in an acid which can be replaced by a monovalent metal, as, HCl—monobasic, H_2SO_4—dibasic **b dyes** A group of aniline colors used for dyeing mordanted cotton and silk They are the salts of colorless bases with acetic, oxalic, nitric, sulfuric or hydrochloric acid, which decompose during the dyeing process The free base combines with the acid constituent of the animal fibre or the acid constituent of the mordant in the case of vegetable fibres, thereby fixing the color in the fibre **b hearth** See Thomas process **b lime phosphate** A superphosphate neutralized with an excess of 6 % calcium carbonate **b nitrogen** The nitrogen of a protein due to the basic amino acids and cystine precipitable by phosphotungstic acid **b phosphate slag** B slag **b principle** An alkaloid **b rocks** A class of igneous rocks which consist of free basic oxides, *e g*, corundum, magnetite, and some of the titaniferous iron ores **b salt** A compound of bases and acids in which not all of the hydroxide of the base has been replaced by an acid radical, *e g*, bases that are not completely neutralized, *e g*, $Bi(OH)_2Cl$ and $Bi(OH)Cl_2$ **b slag** Thomas slag, Thomas phosphate A finely-ground by-product of steel manufacture which contains 12–25 % P_2O_5, 40–50 % CaO and 5–15 % SiO_2, 80 % of the phosphoric acid should be soluble in 2 % citric acid

basichromatin The basic portion of the chromatin molecule

basicity (1) Basic capacity (2) The reciprocal of acidity, measured either as (a) hydroxyl ion concentration (effective alkalinity or intensity of action) or (b) normality (free alkalinity or amount of action) Cf *acidity*

basil (1) Sweet basil The plant *Ocimum basilicum*, a Labiatae, used as flavoring in cooking, a carminative and an aromatic (2) A tanned sheepskin **b oil** The essential oil from the leaves of *Ocimum basilicum* A yellow, aromatic liquid, d 0 945–0 987, $[\alpha]_D$ = +7° to +12°, soluble in alcohol The chief constituents are cineol, chavicol, linalool, used for flavoring

Basil Valentine A Benedictine monk of Erfurt (Germany) and alchemist noted for his description of antimony salts and his recognition of the nitrates of bismuth, tin, mercury, the preparation of hydrochloric acid, sugar of lead, the discovery of methods for the manufacture of sulfuric acid and ammonia His works are dated the 15th century but are supposed by some to date from the 17th century

basophil Capable of being stained by basic dyestuffs (*e g*, cells)

bass Bast **b wood** Linden

bassisterol $C_{27}H_{46}O$ = 383 3 An alcohol occurring in the unsaponifiable part of illipé *butter*, q v

bassora gum A mixture of highly colored gums of the tragacanth type, from India, partly soluble in water

bassorin $C_6H_{10}O_5$ = 262 1 Tragacanthose A carbohydrate from tragacanth and other gums A colorless tasteless powder, soluble in alkalis, it produces a stiff gel and then a viscous paste with water

bast Bass The fibrous inner part of *Calotropis gigantea*, an Asclepiadaceae, from Russia, used for ropes, mats and shoes **b fiber** See *fiber*

bastite An altered pyroxene, resembling serpentine

bastnasite Hamartite A rare earth carbonate [(Ce, La, Di)F]CO_3

bastose The cellulose of jute

basylous An obsolete term for basic

bat guano The droppings, dead bodies, etc of bats, deposited in caves or in arid areas, used as fertilizer

Bates polariscope A polariscope with adjustable brightness of illumination, used in sugar refineries **b tube** A metallic tube for the Bates polariscope

bath A vessel or device for keeping objects at a definite or varying temperature **air-** A b in which the object is surrounded by air of definite temperature **metal-** A b in which the object is suspended in a molten metal **oil, paraffin-** A b containing molten paraffin **sand-** A shallow dish filled with sand **steam-**

A device by which an object is heated by means of steam **water-** A metallic container of varied design for keeping water heated to a certain temperature Cf *thermostat*

bathochrome A organic radical which, when introduced into an organic molecule, causes a shift in the absorption spectrum toward the red Cf *auxochrome*

batholite A molten granite having permeated sedimentary layers

bating Puering

batrachiolin A vitellin from frogs' eggs

batracin An arrow-poison of South American natives, prepared from the skin of an amphibian, *Phyllobates chocoensis*

Battersea A brand of crucibles, muffles, roasting dishes and scorifiers

battery Any two or more electrical cells, dynamos or couples connected so that they behave as a single supply of electricity **dry-** A number of dry cells, usually three, used for electrical pocket lights, etc and other machines **storage-** Accumulator

batyl alcohol $C_{21}H_{44}O_3$ = 344 3 The glyceryl ether $C_{18}H_{37}O—C_3H_5(OH)_2$ from shark liver oils, lustrous crystals, m 69 Cf *chimyl* and *selachyl* alcohols

Baudouin test A test for sesame oil cane sugar or an alcoholic solution of furfural is added to boiling HCl, and the oil gives a red color

Baumann, Eugen 1846–1896 A German chemist **B - Schotten reaction** A reaction between alcohols and acid chlorides in alkaline solution to give an ester $R\,OH + R'\,COCl + NaOH \rightarrow R'\,COOR + NaCl + H_2O$

Baumé, Antoine 1728–1804 A French pharmacist who devised a hydrometer scale **B hydrometer** A hydrometer with B 's scale See *hydrometers* **B scale** A hydrometer scale for the determination of the densities of liquids

bausteine German for building stone The amino acids of the proteins which are necessary as the "building stones" of the protoplasm of an organism Cf *polypeptides*

bauxite Beauxite A native aluminum hydroxide, $Al_2O(OH)_4$, forming a white grayish or reddish clay-like mineral which often contains iron, used in the manufacture of alum, aluminum and fire-bricks See also *boehmite, alexite*

bay The sweet bay or laurel tree *Laurus nobilis*, a Lauraceae **indian-** *Laurus indica* (Lauraceae) **red-** *Persea carolinensis* (Lauraceae) Cf *Bayberry*

b leaves oil The essential oil distilled from bay leaves, *Laurus nobilis* **b oil** Myrcia oil An essential oil from *pimenta acris* A pale, yellow liquid, d 0 965–0 995 The chief constituents are chavicol, eugenol and myrcene **b rum** See *bay-rum* **b salt** Crude sodium chloride, obtained by evaporating sea water in shallow pits **b wood** A mahogany from Honduras (Campeche bay)

bayberry (1) The fruit of *Laurus nobilis*, European laurel or sweet bay (2) The fruit of *Myrica cerifera*, wax myrtle (3) The fruit of *Pimenta acris*, allspice or pimenta **b bark** Myrica, candleberry, waxberry The dried bark of the root of *Myrica cerifera*, a Myricacea It is used as a fluid extract as a digestive, carminative or nerve stimulant **b wax** Myrtle wax, laurel wax, bayberry tallow A green, wax-like mixture of fats, chiefly palmitin, derived from the fruits of myrica

baycurine An alkaloid from the roots of *Statice brasiliensis* (baycuru root), a Plumbaginaceae of Brazil

baycuru root The roots of *Statice brasiliensis* (Plumbaginaceae) It is one of the most powerful astringents known, and is used in the form of fluid extract

Bayer acid (1) *2 8-* or *2 7-*Naphthylaminesulfonic acid (2) Also applied to *β*-Naphthol sulfonic acid **B 205** Germanin

bayerite A native aluminum hydroxide, $Al(OH)_3$, similar to boehmite

bayldonite A native lead vanadate

bay-rum Bay rum, spiritus myrciae An aromatic liquid containing 8 cc bay oil, 0 5 cc orange oil, 0 5 cc pimenta oil, 610 cc alcohol, 320 cc water per liter Used as refreshing ablution, in cosmetics and perfumery

B B C Brombenzyl cyanide

bbl An abbreviation for *barrel(s)*

bdella Hirudo

bdellium An aromatic gum-resin from various sources, as, *Balsamodendron africanum, Balsamodendron mukul* Cf *Burseraceae*

Be The symbol for beryllium, sometimes called glucinum, Gl

Bé Abbreviation for Baumé

bead test A qualitative flame test, made by placing a crystal of microcosmic salt or borax in the loop of a platinum wire, melting it to a bead in the bunsen flame, dipping it into the substance to be analysed and again holding it in the bunsen or blow-pipe flame, exposing it either to the oxidizing (OF), or reducing (RF) part of the flame The color of the clear flux indicates the presence of metals as follows

	Microcosmic salt		*Borax*	
	O F	R F	O F	R F
Cr	green	green	green	green
Co	blue	blue	blue	blue
Cu	blue	red	greenish-blue	red
Fe	brown	colorless or gray	yellow	green
Mn	violet	colorless	violet	colorless
Mo	colorless	green	colorless	brown
Ni	yellow	brown	brown	gray
Ti	colorless	violet	colorless	yellow
W	colorless	blue	colorless	brown
U	green	green	red	green
V	yellow	green	colorless	green

beaded Like a string of beads, as, disjointed colonies of bacteria along the line of inoculation

beading The production of bead-shaped drops *e g*, by condensing alcohol vapor

beading oil A mixture of sweet almond oil and ammonium sulfate, used for the production of artificial beading in distilled liquids

beaker A cup-shaped vessel made of glass, quartz, porcelain, aluminum or copper, used in laboratories for heating liquids **b flask** A wide-lipped conical beaker or flask

Beale's stain An aqueous carmine solution containing some alcohol, ammonium and glycerin, used for staining nerve and connective tissue

bean (1) The seeds of Leguminosae or plants of the bean family (2) Any other similarly shaped seed or seed pod **bog-, buck-** Menyanthes **broad-, common-** The seeds of

Vicia (Faba) vulgaris **calabar-** Physostigma **castor-** See *castor* **French-, kidney-, navy-** The seeds of *Phaseolus vulgaris* **Lima-** The seeds of *Phaseolus lunatus* **ordeal-** Physostigma **soja-, soya-** See *soy* **St Ignatius-** Strychnos **vanilla-** See *vanilla*

bearberry Uva ursi **b bark** Cascara sagrada

bearing The socket of an axle or rotating shaft **b metal solution** A mixture of 400 cc conc HCl, 200 cc conc HNO_3, 40 gm KCl and 1 l of water

bearsfoot The root of *Polymnia uvedalia*, a Compositae of North America, used as fluid extract as a tonic or alterative **English-** The plant *Helleborus foetidus*, a Ranunculaceae

bearsweed Eriodictyon

bearwood Cascara sagrada

beater An oval shaped vessel used in paper making It contains a roll provided with blunt knives which circulates the pulp and cuts, fibrillates and hydrates it

Beaudouin's Reagent See *Baudouin*

Beaumé See *Baumé*

beauxite Bauxite

beaverite A highly-hydrated lead sulfate, from Beaver County, Utah, U S A

bebeerine $C_{18}H_{21}O_3N$ = 299 30 Bauxine, bebirine, cissampeline, pelosine An alkaloid from bebeeru, the bark of *Nectandra rodiaei*, A Lauraceae of Guiana, and *Cissampelos pareira*, a Menispermaceae of S Africa A white amorphous powder, m 214, $[\alpha]_D$ −298°, soluble in alcohol or ether It is an antipyretic and tonic similar to quinine **b hydrochloride** $C_{18}H_{21}O_3N$ HCl = 335 76 Reddish scales, m 259, soluble in water or alcohol **b sulfate** $(C_{18}H_{21}O_3N)_2$ H_2SO_4 = 696 6 Brownish crystals, soluble in water

bebeeru The bark of the green-heart tree, *Nectandra rodiaei*, a Lauraceae of tropical America, used like cinchona bark Cf *chondrodine*

bebirine Bebeerine

beccarite An olive-green, vitreous, native zirconium oxide, ZrO_2

beche-de-mer Trepang A marine slug of the Pacific coral reefs, which is eaten as a delicacy by the Chinese

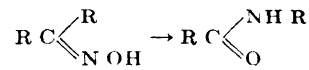
Becher, Johann Joachim 1635–1682 A German physician, adventurer and alchemical writer, noted as the founder of the phlogiston theory

Bechhold filter An ultra-filtration apparatus for the separation of colloids by means of disks impregnated with nitrocellulose

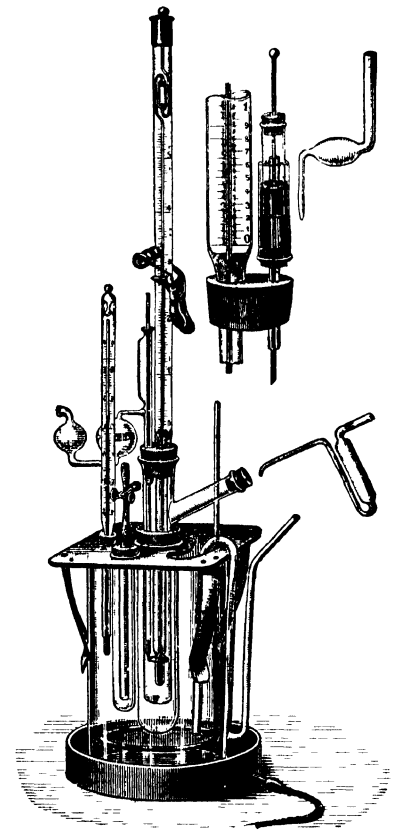
bechilite Borocalcite

beckelite A calcium silicate containing cerium, lanthanum and didymium

Beckmann, Ernst 1853–1923 A German organic chemist noted for molecular weight determinations, and work on isomerism and hydroxylamine **B apparatus** A glass apparatus for the determination of the molecular weight by (a) the lowering of the freezing point, or (b) raising of the boiling point of a solution See figure **B burner** A glass tube used as a burner and supported over a dish in which vapors or gases are evolved, it is used for producing colored flames **B reaction B rearrangement** An intramolecular rearrangement, during which a ketoxime forms its isomeric amide, when treated with phosphorus pentachloride



B thermometer Ultrathermometer A thermometer used in the B apparatus to read temperatures accurately to 0 01°C over any desired small range (about 6°C) The amount of mercury in the bulb, and therefore the temperature at which the thermometer is used, may be altered at will



Beckmann apparatus

Becquerel, Antoine Henri 1852–1908 A French physicist and discoverer of radioactive radiations **B rays** The radiations emitted from uranium and similar substances which affect the photographic plate Cf *radioactive* rays

becquerelite $2UO_3$ $3H_2O$ A hydrous, radioactive mineral of the Belgian Congo, it contains 70 % uranium, and is the most radioactive mineral

beda nuts The dried ripe seeds of *Terminalia belerica* (cf *myrobalan*), exported from India, used for tanning and in the preparation of a black dye

bee balm Monarda

beech A genus of trees, *Fagus sylvatica* Cf *fagine* **b nut** The seeds of b used for expression of oil and for b nut cake **b wood creosote** The distillation product of b wood, used as antiseptic and preservative

beef extract An aqueous extract of lean beef, partly desiccated, which contains the soluble

fibrin and proteins; it is used as a nutrient and in the preparation of culture media.

beegerite. A native lead sulfobismuthide, $Pb_6Bi_2S_9$ or $6PbS,Bi_2S_3$; d.7.2.

beehive. A small circular glass shelf with a hole in the top, used for collecting gases in pneumatic troughs.

beemerose. A nephelite rock or elaeolite syenite from New Jersey.

beer. A beverage containing from 3 to 7 % alcohol; a fermented infusion or decoction of malted barley with hops. Cf. *brewing wort.* **near-** One containing less than 0.5 % alcohol, in use during prohibition in U.S.

Beer's law. The intensity of a color or of an emergent ray of light is inversely proportional to the depth of liquid through which it travels; hence the absorption depends on the number of molecules present. Cf. *Lambert's* law.

beerbachose. A diorite rock from Butte County, California.

beeswax. (1) Wax from the honeycomb of bees. It contains cerolein, cerotic acid, myricyl alcohol, melissic acid and the alkanes: $C_{25}H_{52}$, $C_{27}H_{56}$, $C_{29}H_{60}$, $C_{31}H_{64}$. (2) White wax, cera alba. The bleached wax from the honeycomb of bees, d.0.965–0.969, m.63; used in pharmacy and industry.

beet. The plant *Beta vulgaris*, a Chenopodiaceae, cultivated for its root (sugar beet) containing up to 20 % sugar. **b. slop.** The liquid product remaining after extraction of b. sugar. It contains from 3–4 % N, and 8–10 % K; used as fertilizer. **b. sugar.** Sugar obtained from the beet by a process of liquid extraction. See *sucrose.*

Beggiatoaceae. A family of bacteria, which consist of motile cells in sheathless threads containing sulfur granules.

behenic acid. $C_{22}H_{44}O_2$ = 340.44. Docosanoic acid*, *n*-docosoic acid, $Me(CH_2)_{20}COOH$. A constituent of ben oil and the roots of *Centaurea behen.* Colorless needles, m.84, b.306, insoluble in water, sparingly soluble in alcohol or ether.

behenolic acid. $C_{22}H_{40}O_2$ = 336.43. Δ^{13}-docosanoic acid, *1.3*-docosynoic acid*, $Me(CH_2)_7C{:}C(CH_2)_{11}COOH$. White needles, m.57.5; insoluble in water, soluble in alcohol or chloroform.

behenolyl. The monovalent radical, $C_{21}H_{39}CO$—, derived from behenolic acid. **b. amide.** $C_{22}H_{41}ON$ = 335.3. Colorless crystals, m.90. **b. chloride.** $C_{22}H_{39}OCl$ = 342.3. Colorless crystals, m.29.

Behr, Arno. An American chemist; a pioneer in the corn-products industry.

beidellite. A clay mineral from Beidell, Colo., inactive in base exchange. $Al_2O_3.3SiO_2.4H_2O$.

Beilby layer. The amorphous atomic layer formed on the surface of a metal when it is polished, or when two crystal surfaces are rubbed together.

Beilstein, Friedrich Konrad. 1838–1906. A Russian-born German chemist noted as compiler of **B.'s Handbuch.** A general reference book of 18 volumes describing 200,000 organic compounds. Cf. *Prager*-Jacobson classification.

bel. A unit of comparative loudness (not intensity) of sound. The log of the ratio of the intensities of two sounds. The smallest change in the loudness that the ear can detect. Cf. *sound, loudness.*

belcherose. A pyroxenite rock from Massachusetts.

beldongrite. A native manganese iron oxide.

belite. A crystalline constituent of portland cement clinker, probably $2CaO.SiO_2$. Cf. *alite.*

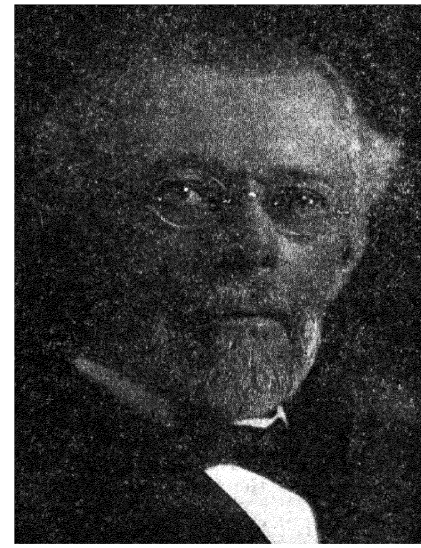
Bell, Jacob. 1810–1859. A British pharmaceutical chemist noted as the founder of the Pharmaceutical Society of Great Britain and the Pharmaceutical Journal.

bell. A hollow cup-shaped vessel. **b. glass.** Bell jars. A glass b. with or without tubulations, used to cover specimens and for experiments in a vacuum. **b. metal.** An alloy of 4 parts copper and 1 part tin, d.8.7; m.890, used for bells. **b. metal ore.** Stannite.

belladonna. Deadly nightshade, bane wort, poison cherry, death's herb. The European herb, *Atropa belladonna*, a Solanaceae whose leaves and roots are used in medicine. **b. leaves.** The dried leaves of *Atropa belladonna.* Used as fluid extract or tincture, as a narcotic, antihydriotic, antispasmodic or anodyne. **b. roots.** The roots of *Atropa belladonna;* used as fluid extract, as an antispasmodic.

belladonnine. $C_{17}H_{21}O_2N$ = 271.26. An alkaloid from belladonna. Cf. *atropine.*

Bellier's Test. A means of detecting upwards of 2 % of arachis oil in a saponified oil, by the formation of arachidic acid (q.v.).



Arno Behr.

belonesite. A molybdenum ore, $MgO.MoO_3$, occurring in needle-shaped crystals.

belonites. The small needle-shaped crystals found in volcanic rocks.

Bemberg silk. An artificial silk made by a cuprammonium process.

ben oil. The expressed oil from the seeds of *Moringa pterygosperma* and *M. oleifera*, a Moringaceae. It is a laxative and bland, and is used for extracting odors. Cf. *benne* oil.

Bence-Jones protein. A protein in the urine of patients with myeloma; it coagulates at 60 and redissolves at 100.

Benedict, Stanley Rossiter. 1884–1936. An American biochemist noted for analytical research. **B's. solution.** Dissolve 173 gm. Na-K tartrate and 200 gm. Na_2CO_3 in 800 cc.

boiling water, filter, add 17 3 gm $CuSO_4$ in 100 cc and dilute to 1 liter **quantitative** For direct determination of reducing sugars, 25 cc reduce 50 mg glucose Use 18 0 gm $CuSO_4$, 200 gm Na or K citrate, 200 gm Na_2CO_3 $10H_2O$, 125 gm KCNS and 5 cc 5 % potassium ferrocyanide solution per liter **B test** A test for glucose Add 5 cc of B solution to about 8–10 drops of the sample, heat, if glucose is present a red or yellowish precipitate forms

Bengal isinglass Agar **b kino** *Butea* gum **b lights** A mixture of sulfur, sugar, and potassium nitrate to which either barium or strontium salts are added This gives a green or red light, used in pyrotechnics

benjamin *Benzoin* gum

benne oil Sesame oil

Bennert manometer A U-shaped, graduated glass tube mounted on a board and used as a manometer

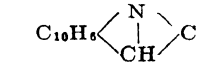
bentonite Sodium montmorillonite A clay of the Pacific Coast States, which swells when wetted, and has strong adsorbing properties

benz Benzo-

benzacetin (1) $C_{11}H_{13}O_4N$ = 223 11 Acetamido-ethylsalicylic acid Colorless crystals, m 190 Cf *phenacetin* (2) $C_{10}H_{11}O_4N$ = 209 09 Acetamido-methyl-salicylic acid Colorless crystals, m 205

benzaconine $C_{32}H_{43}O_{10}N$ = 601 1 Benzoylconine, picraconitine, napelline An alkaloid produced by the partial hydrolysis of aconitine, m 130

benzacridine $C_{17}H_{11}N$ = 229 1 Phenonaphthacridine The heterocyclic compound



dihydro- b carboxylic acid Tetrophan

benzal Benzilidene, benzenyl The divalent radical, Ph CH <, derived from toluene Cf *benzylidene, benzenyl*

benzalacetone $C_{10}H_{10}O$ = 146 1 Benzylidene acetone, cinnamyl methyl ketone, acetocinnamone methyl styryl ketone, PhCH CH CO Me Colorless crystals, m 41, b 262 It has coumarin-like odor, is soluble in alcohol or ether, used in organic synthesis

benzalacetophenone $C_{15}H_{12}O$ = 208 17 Cinnamyl phenyl ketone, PhCH CH CO Ph Colorless crystals, m 62, b 346, insoluble in water, soluble in alcohol or ether

benzalagen Analgen

benzalaniline $C_{13}H_{11}N$ = 181 1 Benzilidene aniline PhCH NPh Colorless crystals, m 45, used in organic synthesis

benzalazine $C_{14}H_{12}N_2$ = 208 1 Benzilideneazine, benzaldehyde azine, dibenzalhydrazine PhCH N N CHPh Yellow prisms, m 93, decomp , insoluble in water, soluble in hot alcohol, ether or chloroform

benzalbromide $C_7H_6Br_2$ = 249 87 Benzylidene bromide, α-dibromotoluene, $PhCHBr_2$ A fuming oily liquid, d 1 51, b 140

benzalchloride $C_7H_6Cl_2$ = 160 99 Benzylidene chloride, benzyl bichloride, benzylene chloride, chlorobenzal, α,α′ dichlorotoluene, bitter almond oil chloride, $PhCHCl_2$ A colorless liquid, d 1 2577, m −16, b 206, insoluble in water, miscible with alcohol or ether Used in chemical warfare and in the manufacture of dyes

benzalcohol Benzyl alcohol

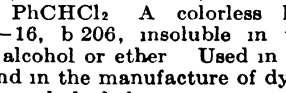
benzalcyanhydrin C_8H_7ON = 133 11 Benzaldehyde cyanohydrin, mandelonitrile The additive compound PhCH(OH)CN, formed from benzaldehyde and hydrocyanic acid A colorless liquid, d 1 121, m −10, decomp 170, insoluble in water, soluble in alcohol or ether

benzaldehyde (*ben-zal′-de-hid*) C_7H_6O = 106 09 Phenylaldehyde, benzene carbonal*, benzene methylal, benzoylhydride, artificial almond oil, Ph CHO A colorless liquid of bitter almond odor, d 1 0504, m −13 5, b 179, sparingly soluble in water, miscible with alcohol, ether or chloroform Used in the manufacture of dyes, perfumes, and drugs, also as a reagent for detecting alkaloids and fusel oil **o-amino-** $NH_2C_6H_4CHO$ = 121 1 Anthranilaldehyde Colorless leaflets, m 39, decomp on further heating, slightly soluble in water, readily soluble in alcohol or ether **m-amino-** A yellow amorphous powder **p-amino-** Colorless scales, m 70, soluble in water **α-bromo-** Benzoylbromide **α-chloro-** Benzoylchloride **cyano-** Benzoylcyanide **diethylamino-** See *diethyl-*, **dihydroxy-** *2 3-* Pyrocatechualdehyde *2 4-* *β*-Resorcylaldehyde *2 5-* Gentisaldehyde *3 4-* Protocatechuic aldehyde **dimethoxy-** Veratraldehyde **dinitro-** $(NO_2)_2C_6H_4CHO$ = 196 05 Dinitrobenzene carbonal* Yellow crystals **2 4-** m 72 b $_{10mm}$195 **2 6-** m 123 Slightly soluble in water ***3*-ethoxy-*4*-hydroxy-** Bourbonal **ethoxy-methoxy-** Vanillin ethyl ether **hexahydro-** Cyclohexane aldehyde **o-hydroxy-** Salicylaldehyde **m-hydroxy-** Colorless needles, m 104, b 240 soluble in water, alcohol or ether **p-hydroxy-** Colorless needles, m 115, sublimes on further heating, sparingly soluble in water, soluble in alcohol or ether **hydroxy-methoxy-** Vanillin **isopropyl-** Cumaldehyde **p-methoxy-** Anisaldehyde **methyl-** Tolylaldehyde **methylenedioxy-** Piperonal **o-nitro-** $NO_2C_6H_4CHO$ = 151 09 Yellow needles, m 44, b $_{23mm}$153 slightly soluble in water, soluble in alcohol or ether **m-nitro-** Colorless needles, m 58 b $_{23mm}$ 164, very slightly soluble in water, soluble in alcohol or ether **p-nitro-** Colorless prisms, m 106 insoluble in water, soluble in alcohol or ether **trihydroxy-** *3 4 5-* Gallaldehyde **trimethyl-** Durylaldehyde **trinitro-** $(NO_2)_3C_6H_3CHO$ = 241 05 Trinitrobenzene carbonal* **2 4 6-** Yellow scales, m 119, insoluble in water

b azine Benzalazine **b cyanhydrin** See *benzalcyanhydrin* **b green** Malachite green **b hydrazone** Benzalhydrazine **b oxime** Benzaldoxime **b phenylhydrazone** $C_{13}H_{12}N_2$ = 196 18 Benzalphenylhydrazone benzilidenephenylhydrazine, PhCH N NHPh Colorless crystals, m 155, b $_{15mm}$236, slightly soluble in ether

benzaldiphenyl maleid PhCH $(C_2O_2)Ph_2$ = 312 08

benzaldoxime C_7H_7ON = 121 10 Benzaldehydeoxime The compound PhCH NOH, which occurs in several isomeric forms, each giving two series of derivatives



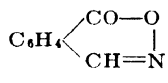
alpha- Benzantialdoxime, antibenzaldoxime Colorless leaflets, d 1 11, m 35, b $_{0mm}$117 **beta-**

Benzsynaldoxime, synbenzaldoxime, isobenzaldoxime Colorless needles, m 125, insoluble in water, slightly soluble in benzene or ether The substitution products and their terminology are

N—OR	N—OR	R—N O	R—N O
‖	‖	‖	‖
ICPh	PhCH	HCPh	PhCH
O-syn-	*O-anti-*	*N-syn-*	*N-anti-*
β-O	*α*-O	*β*-N	*β*-N

p-methoxy- PhCHOHMe = 135 08 Anisaldoxime Colorless crystals, m 45 **N-methyl-** Benzantialdoxime-N-methylether **O-methyl-** (1) Benzantialdoxime-O-methylether, PhCN - NOMe = 135 08 Colorless liquid, b 191 (2) Benzsynaldoxime-O-methylether Colorless crystals, m 82 **N-phenyl-** Antibenzaldoxime-N-phenylether, PhCH NOPh = 197 08 Colorless crystals, m 109 **m-nitro-alpha-** Colorless crystals, m 117 **p-nitro-alpha-** Colorless crystals, m 129 **o-nitro-beta-** Colorless crystals, m 136 **m-nitro-beta-** Colorless crystals, m 118 **p-nitro-beta-** Colorless crystals, m 174

b acetate PhCH NO $COCH_3$ = 163 08 **anti-** Colorless crystals or liquid, m 15, soluble in water **b acetic acid, anti-O-acetic acid** PhCH NO CH_2COOH = 179 09 Colorless crystals, m 98 **anti-N-acetic acid** PhCH-(ON)CH_2COOH = 179 09 Colorless crystals, m 183 **b carboxylic anhydride** $C_8H\ O_2N$ = 147 09 The ring compound



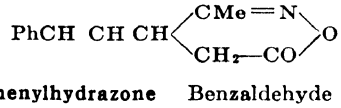
which, at 145°C, becomes $C_6H_4(CN)COOH$

enzalethylamine $C_9H_{11}N$ = 133 1 PhCH - NC_2H_5 Colorless liquid, b 195

enzal green Malachite green

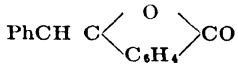
enzalhydrazine $C_7H_8N_2$ = 120 1 Benzylidene hydrazine, benzaldehyde hydrazone, PhCH - $N\ NH_2$ Colorless crystals or liquid, m 16, b_{14mm}140

enzallevoxime $C_{12}H_{13}O_2N$ = 203 1 The heterocyclic compound,



enzalphenylhydrazone Benzaldehyde phenylhydrazone

enzalphthalide $C_{15}H_{10}O_2$ = 222 1 Benzylidene phthalide Colorless crystals, m 99,



enzamarone $C_{35}H_{28}O_2$ = 480 7 *α*-Benzalbisdesoxybenzoin, *1 2 3 4 5*-pentaphenyl-*1 5*-pentanedione* PhCH(CHPh COPh)$_2$ Colorless crystals, m 219, slightly soluble in hot water

enzamide C_7H_7ON = 121 14 Benzoylamide, benzene carbon amide*, benzoic amide The amide PhCONH$_2$ Colorless monoclinic tables, d_4° 1 341, m 128, b 290, slightly soluble in water, soluble in alcohol, ether or ammonia **o-amino-** Aminobenzene carbon amide* NH_2 - $C_6H_4CONH_2$ = 136 12 Colorless leaflets, m 108, soluble in water, alcohol or ether **m-amino-** Yellow leaflets, m 79, b 298, slightly soluble in water, soluble in alcohol or ether **p-amino-** Yellow crystals, m 179, slightly soluble in water **benzoyl-** Dibenzamide **bromo-** C_7H_6NOBr = 199 97 Colorless crystals, *o-* m 156, *m-* m 150, *p-* m 190 **chloral-** See *chloral* **choro-** C_7H_6NOCl = 155 56 Chlorobenzene carbon amide* Colorless crystals, *o-* m 141, *m-* m 135 4 *p-* m 178 3 **di-** Dibenzamide **fluoro-** C_7H_6NOF = 139 05 Colorless crystals, *o-* m 116, *m-* m 130, *p-* m 154 5 **hydro-** See *hydrobenzamide* **o-hydroxy-** HO $C_6H_4CONH_2$ = 137 10 Salicylamide Yellow leaflets m 140, decomp 270, soluble in water **m-hydroxy-** Colorless leaflets, m 170, soluble in water alcohol or ether **p-hydroxy-** Colorless needles, m 158, sparingly soluble in water soluble in alcohol or ether **hydro-** $(PhCH)_3N_2$ = 298 17 Tribenzalamine Colorless needles, m 101, insoluble in water, soluble in alcohol or ether **iodo-** C_7H_6NOI = 246 99 Colorless crystals, *o-* m 183 6, *m-* m 186 5, *p-* m 217 6 **methyl-** Toluamide **o-nitro-** $NO_2C_6H_4CONH_2$ = 166 10 White needles, m 174, b 317°C, soluble in water, alcohol or ether **m-nitro-** Yellow needles, m 141, b 315, sparingly soluble in water, soluble in alcohol or ether **p-nitro-** Colorless needles, m 153, sparingly soluble in water, soluble in alcohol or ether **n-phenyl-** Benzanilide *m*-**semicarbazido-** Cryogenin **silver-** PhCONHAg or PhC(NH)OAg = 227 94 **sodium-** PhCONHNa or PhC(NH)ONa = 143 06 **tri-** $(PhCO)_3N$ = 329 13 Tribenzalamine Colorless crystals, m 202 **thio-** See *thiobenzamide*

b oxime Benzamidoxime

benzamidine $C_7H_8N_2$ = 120 14 Benzenylamidine, iminobenzylamine, benzene carbonamidine*, PhC(NH_2) NH Colorless crystals, m - 75, soluble in water, alcohol or ether **b urethane** PhC(NH)NHCO OC_2H_5 = 192 12 Colorless crystals, m 38

benzamido The monovalent radical, Ph-CONH—, derived from benzamide

benzamidoxime $C_7H_8N_2O$ = 136 08 Benzenylamine oxime, benzamide oxime, PhC-(NOH)NH_2 White crystals, m 80, slightly soluble in water

benzamine *β*-Eucaine **b lactate** $C_{15}H_{21}O_2N$ - $C_3H_6O_3$ = 337 24 Benzoyl vinyl diacetone alkamine lactate Colorless crystals, soluble in water or alcohol and used for the synthesis of eucaine

benzaminic acid *m*-Amino *benzoic acid*

benzamino acids Amino-*benzoic acids* **b acetic acid** Hippuric acid

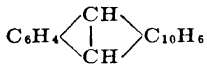
benzanalgen Analgen

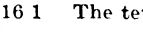
benzanilide $C_{13}H_{11}ON$ = 197 2 Phenylbenzamide, benzoylaniline, Ph CO NH Ph White or pinkish crystals, d 1 32, m 160, insoluble in water, slightly soluble in alcohol or ether, used as an antipyretic **ethoxy-** Benzophenetide **hydroxy-** $C_7H_7O_2N$ = 137 06 Benzoylaminophenol, HO C_6H_4 $CONH_2$ Colorless crystals, *o-*m 140, *m-* m 170 5, *p-* m 162, used in organic synthesis **methoxy-** Benzaniside **methyl-** Benzotoluide **nitro-** See *nitrobenzanilide* **thio-** See *thiobenzamide*

benzaniside $C_{14}H_{13}O_2N$ = 232 3 Methoxybenzanilide MeO C_6H_4 CONHPh

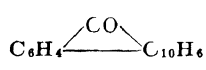
benzanthracenes $C_{18}H_{11}$ = 227 1 A group of hydrocarbons in which a benzene and anthracene ring have a double bond in common Many of them are carcinogenic Cf *benzpyrene*

benzanthrene $C_{18}H_{12}$ = 228 1 Naphthanthracene The tetracyclic hydrocarbon



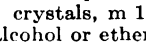
meso- C_1H_{12} = 216 1 The tetracyclic hydrocarbon C_6H_4  $C_{10}H_6$

benzanthrenone $C_1H_{10}O$ = 230 1 The tetracyclic ketone



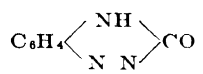
benzantialdoxime See *benzaldoxime*

benzaurine $C_{19}H_{16}O_3$ = 274 21 Phenyldiphenylcarbinol The compound PhC C_6H_4 O - C_6H_4OH Yellow crystals, m 100, insoluble in water, soluble in alcohol or ether

benzazete C_7H_5N = 103 1 The heterocyclic compound C_6H_4  CH

benzazide Benzoylazide

benzazimide $C_7H_5ON_3$ = 147 1 Phenketodihydro-β-triazine,



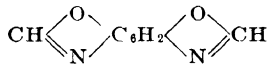
Colorless crystals, m 212

benzazine (1) Quinoline (2) *Iso*quinoline

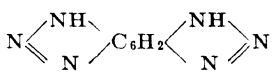
benzazole 1- Indole 2- *Iso*indole **iso-** Indolenine

benzb See also *benzob*

benzbioxazole $C_8H_4O\ N_2$ = 160 1 The heterocyclic compound



benzbitriazole $C_6H_2N_6$ = 158 3 The heterocyclic compound



benzdiazine Benzodiazine

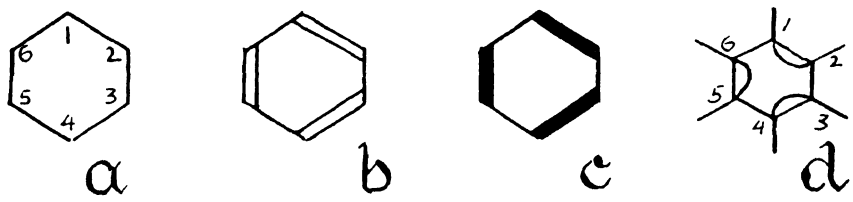
benzdifuran Benzodifuran

benzdioxazine Benzodioxazine

benzedrine $C_9H_{13}N$ = 135 1 β-Phenyl-2-propylamine, amphetamine Ph CH_2 $CHNH_2$- CH_3 White crystals, insoluble in water, which are inhaled to prevent sleepiness Cf *ephedrine*

benzene C_6H_6 or PhH = 78 08 Benzol (Ger), benzole (Fr), phenylhydride, cyclohexatriene, phene* A colorless liquid or crystals $d_{20°}$ 0 879, m 5 4°, b 80 3°, insoluble in water, miscible with alcohol, ether, acetone or glacial acetic acid It is a solvent for alkaloids fats, rubber, and resins and is used in organic synthesis, in the manufacture of dyes, in photography, as a motor fuel and in electrotechnics Medicinally it is a narcotic and destroys leucocytes Cf *b structure* **acetenyl-** Phenyl*acetylene* **acetyl-** Acetophenone **allyl-** See *allyl* **amino-** Aniline **aminoethoxy-** Phenetidine **aminoethyl-** C_6H_4- $NH_2C_2H_6$ = 121 14 **o-** A colorless liquid $d_{22°}$ - 0 983 b 215, **m-** A colorless liquid, $d_{0°}$ 0 990, m 214, **p-** White leaflets, $d_{22°}$ 0 995, m 5, b 260 **amyl-** PhC_5H_{11} = 148 18 Phenyl pentane, n-amylbenzene A colorless liquid, $d_{20°}$ 1 223, b 129, soluble in alcohol **anilino-** Diphenylamine* **arsenobis-** Arsenobenzene **azimino-** Benzotriazole **azo-** Azobenzene **azoxy-** Azoxybenzene **benzoyl-** Benzophenone **benzyl-** Diphenylmethane **bromo-*** Phenyl bromide **bromo-chloro-*** BrC_6H_4Cl = 191 40 **1 3-** or **m-** A colorless liquid, d 1 6302, m −21 b 196 **1 4-** or **p-** White prisms, m 67 4 b 196 3 **bromo-fluoro-*** BrC_6H_4F = 174 95 **1 4-** or **p-** A colorless liquid, b 153 **bromo-iodo-*** BrC_6H_4I = 282 86 **1 2-** or **o-** Colorless liquid, d 2 257, m 2 1, b 258 **1 3-** or **m-** An oily liquid, m −9 3, b 252 **1 4-** or **p-** White needles, m 92, b 251 **bromo-nitro-*** $Br\ C_6H_4\ NO_2$ = 201 96 **o-** Colorless crystals, m 38, b 264, insoluble in water, soluble in alcohol or ether **m-** Colorless crystals, d 1 704, m 52 6, b 257 5, insoluble in water, soluble in alcohol or ether **p-** White monoclinic crystals, $d_{20°}$ 1 934, m 125, b 259, insoluble in water, soluble in alcohol **chloramido-** Chloraniline **chloro-*** Phenyl chloride **chloronitro-*** $ClC_6H_4NO_2$ = 157 55 **o-** Colorless needles, $d_{22°}$ 1 368, m 32 5, b 246, insoluble in water, soluble in alcohol or ether **m-** Colorless rhombic needles, d 1 534, m 44 2, b 235 6, insoluble in water, soluble in alcohol, ether, or benzene **p-** White monoclinic prisms, $d_{15°}$ - 1 520, m 83, b 240, insoluble in water, soluble in alcohol **chlorotrinitro-*** Picrylchloride **cyano-** Benzonitrile **diamino-** Phenylenediamine **diaminoazo-** $(NH_2)_2C_6H_3\ N\ NPh$ = 212 20 **2 4-** Yellow needles, m 117 5, slightly soluble in water, soluble in alcohol or ether The hydrochloride is chrysoidine orange **diazo-** See *diazo* **diazoamino-** $PhN\ N\ NHPh$ = 197 27 Yellow leaflets, m 96, insoluble in water, soluble in alcohol or ether **dibromo-*** $C_6H_4Br_2$ = 235 98 Benzene dibromide **o-** Colorless needles $d_{18°}$ 1 977, m −1, b 224, insoluble in water, soluble in alcohol or ether **m-** Colorless crystals, $d_{19°}$ 1 955, m 1, b 219 5, insoluble in water, soluble in alcohol or ether **p-** White monoclinic crystals, d 2 22, m 89, b 219, insoluble in water, sparingly soluble in alcohol **dichloro-*** $C_6H_4Cl_2$ = 146 96 Benzene dichloride **o-** A colorless liquid, $d_{0°}$ 1 325 m −17 6, b 179, insoluble in water, soluble in alcohol Used as solvent, insecticide, spray, metal polish and sweeping compound **m-** A colorless liquid, $d_{0°}$ 1 307 m −24 8, b 173, insoluble in water, soluble in alcohol or ether **p-** Paradow White needles, $d_{15°}$ 1 268, m 53 b 174, insoluble in water, soluble in alcohol or ether Used as antiparasitic, in herbarium collections and museums as a deodorant, and in eliminating the peach tree borer **o-dicyano-** Phthalonitrile **m-** *m-* Phthalonitrile **p-** Terephthalicnitrile **diethoxy-*** $C_6H_4(OCH_3)_2$ = 166 11 **1 2-** Pyrocatechol diethyl ether White crystals, m 166 1 **1 3-** Resorcinol diethyl ether White prisms, m 12 b 235 **1 4-** Hydroquinone diethyl ether White scales m 71, b 246, **diethyl-*** $C_6H_4(C_2H_5)_2$ = 134 17 **o-** A colorless liquid, $d_{18°}$ 0 866, b 185, insoluble in water miscible with alcohol or ether **m-** A colorless liquid, $d_{20°}$ 0 860, b 181, miscible with alcohol or ether **p-** A colorless liquid $d_{18°}$ 0 862 b 183, insoluble in water, miscible with alcohol or ether **difluoro-*** $C_6H_8F_2$ = 114 03 **p-** Colorless liquid, d 1 164, m −23 7, b 88 9, insoluble in water, soluble in alcohol or ether **dihydro-** Cyclohexadiene* **dihydrodiketo-** Quinine **dihydroimino-** Benzenimine **dihydroketo-** Benzenone **dihydroxy-** $C_6H_4(OH)_2$ **1 2-** or **o-** Catechol **1 3-** or **m-** Resorcinol **1 3-** or **p-** Hydroquinol **diiodo-*** $C_6H_4I_2$ =

330 01 **1 2-** or **o-** Colorless prisms, m 23.4, b 286 5, insoluble in water, soluble in alcohol or ether **1 3-** or **m-** White rhombic prisms, m 34 2 b 285, insoluble in water, soluble in alcohol **1 4-** or **p-** White leaflets, m 129 4 b 285, insoluble in water, soluble in alcohol **dimethoxy-* 1 2-** Veratrole **1 4-** Hydroquinoldimethyl ether **dimethyl-*** Xylene **dimethylethyl-*** $C_6H_3(CH_3)_2C_2H_5$ = 134 17 **1-*ethyl*-3 4-*dimethyl*-** A colorless liquid, $d_{20°}$ 0 878, b 183 4, insoluble in water **2-*ethyl*-2 4-*dimethyl*** A colorless liquid, $d_{20°}$ 0 861, b 185, insoluble in water **dinitro-*** $C_7H_4(NO_2)_2$ = 168 14 **1 2-,** or **o-** Colorless scales, $d_{16°}$ 1 565, m 117, b 319, sparingly soluble in water, slightly soluble in alcohol, soluble in benzene **1 3-** or **m-** Yellowish needles, $d_{17°}$ 1 546, m 90 b 297, sparingly soluble in water, soluble in alcohol, ether, or benzene Used in the manufacture of phenylendiamine and explosives **1 4-,** or **p-** White needles, $d_{17°}$ 1 587, m 171, b 298 2, sparingly soluble in water or alcohol, soluble in benzene **diphenyl-** $C_6H_4Ph_2$ = 230 21 **para-**Terphenyl White leaflets, m 205, b 383, insoluble in water, soluble in alcohol, ether or benzene **ethenyl-*** Styrolene **ethoxy-*** Phenetole **ethyl-*** PhC_2H_5 = 106 12 Phenylethane A colorless liquid, $d_{14°}$ 0 874, m −94 b 136 5, insoluble in water soluble in alcohol or ether **ethylmethyl-*** MeC_6H_4Et = 120 1 **1 2-or o-** A colorless liquid, d 0 8731 b 159, **1 3-** or **m-** A colorless liquid, d 0 8690 b 159, **1 4-** or **p-** A colorless liquid, d 0 8652, b 162 **fluoro-*** See *fluobenzene* **formamido-** Formanilide **hexachloro-*** C_6Cl_6 = 284 73 White monoclinic crystals, $d_{23°}$ 2 044, m 229, b 326, insoluble in water, sparingly soluble in alcohol or ether It differs from b hexachloride **hexaethyl-*** $C_6(C_2H_5)_6$ = 246 33 Colorless monoclinic crystals, $d_{20°}$ 0 831, m 129, b 298, insoluble in water soluble in alcohol or ether **hexahydro-** Cyclohexane **hexahydrohexahydroxy-** Inosite **hexahydropentahydroxy-** Pinite **hexahydroxy-** $C_6(OH)_6$ = 174 13 B hexol* Colorless needles, decomp 200, slightly soluble in water, alcohol or ether **hexaiodo-*** C_6I_6 = 833 55 Red-brown needles, decomp 150 **hexamethyl-*** $C_6(CH_3)_6$ = 162 21 Mellitene White rhombic crystals, m 164, b 264, slightly soluble in alcohol **hexaoxy-** See *triquinoyls* **hydrazino-** Phenylhydrazine **hydrazo-** PhNH NHPh = 184 24 Diphenylhydrazine Colorless crystals, d 1 158, m 131, sparingly soluble in water or alcohol, soluble in ether **hydroxy-** Phenol **hydroxyazo-** HO-C_6H_4N NPh = 198 16 **1 2-** or **o-** White needles, m 82 5, slightly soluble in water, soluble in alcohol, ether or alkalis **1 4-** or **p-** White



Benzene ring

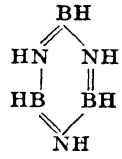
Substitutions are designated by

ortho-	*o-*	1 2- and	*vicinal*	*v-*	1 2 3-
meta-	*m-*	1 3-	*symmetric*	*s-*	1 3 5-
para-	*p-*	1 4-	*asymmetric*	*a-*	1 2 4-

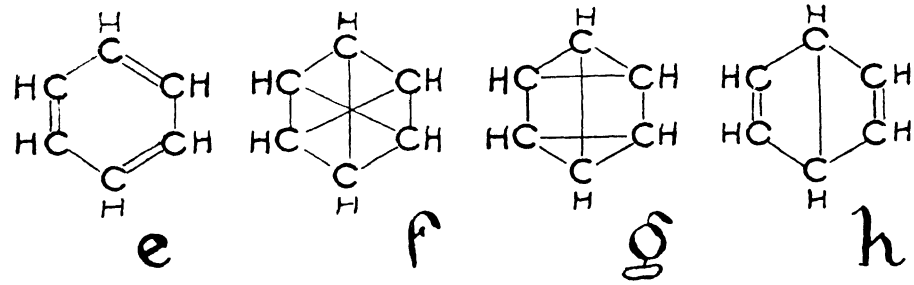
BENZENE SERIES

	No of isomers	*Formula*
cnzene phenylhydride	1	C_6H_6 or PhH
oluene, methylbenzene	1	C_7H_8 or PhMe
ylene dimethylbenzene	3	C_8H_{10} or $C_6H_4Me_2$
ethylbenzene, phenylethane	1	PhEt
iesitylene, hemimellitene, ψ-cumene, trimethylbenzene	3	C_9H_{12} or $C_6H_3Me_3$
methylethylbenzene	3	C_6H_4MeEt
propylbenzene, 1-phenylpropane	1	C_6H_5Pr
cumene, isopropylbenzene, 2-phenylpropane	1	C_6H_5Pr
urene tetramethylbenzene	3	$C_{10}H_{14}$ or $C_6H_2Me_4$
butylbenzene, phenylbutane	3	PhBu
propylmethylbenzene, cymene	6	C_6H_4PrMe
diethylbenzene	3	$C_6H_4Et_2$
entamethylbenzene	1	$C_{11}H_{16}$ or C_6HMe_5
amylbenzene	9	PhC_5H_{11}
butylmethylbenzene	9	C_6H_4BuMe
propyldimethylbenzene	10	$C_6H_3PrMe_2$
propylethylbenzene	6	C_6H_4PrEt
ethyltrimethylbenzene	6	$C_6H_2EtMe_2$
diethylmethylbenzene	6	$C_6H_3Et_2Me$
examethylbenzene	1	$C_{12}H_{18}$ or C_6Me_6
hexylbenzene	25	PhC_6H_{13}
amylmethylbenzene	27	$C_6H_4(C_5H_{11})Me$
butylethylbenzene	27	C_6H_4BuEt
butyldimethylbenzene	54	$C_6H_3BuMe_2$
propyltrimethylbenzene	36	$C_6H_2PrMe_3$
propylethylmethylbenzene	14	$C_6H_2PrEtMe$
dipropylbenzene	9	$C_6H_4Pr_2$

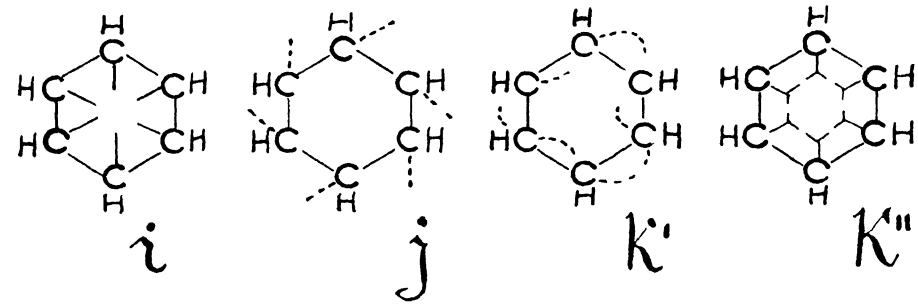
prisms, m 152, slightly soluble in water, soluble in alcohol or ether **inorganic-** The substance formed by the action of ammonia on borane It is a colorless and transparent liquid, and resembles benzene in its physical properties



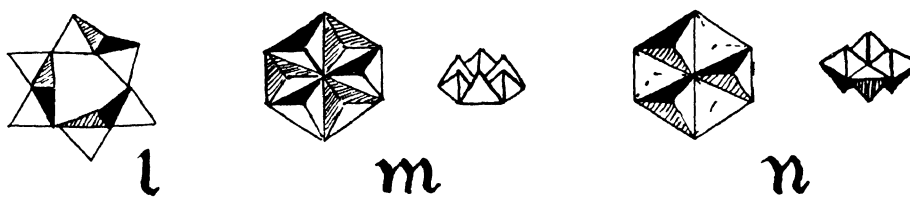
iodo-* PhI = 203 99 A colorless liquid, m -28 5, b 188 2, insoluble in water, miscible with alcohol or ether **iodoso-** PhIO = 219 99 A white amorphous powder which explodes at 210, soluble in water, alcohol or benzene **iodoxy-** $PhIO_2$ = 235 99 Colorless needles which explode at about 230, sparingly soluble in water, soluble in alcohol, ether, chloroform or benzene **isocyano-** Phenylisocyanide **isopropyl-** Cumene **isopropylmethyl-** Cymene **methoxy-*** Anisole **methoxypropenyl-** Anethole **methyl-*** Toluene **methylethyl-*** See *b ethylmethyl-* **methyl-i-propyl-** Cymene **nitro-** $PhNO_2$ = 123 08 A yellow liquid, m 5 4, b 210, with the odor of almonds, very slightly soluble in water, soluble in alcohol or ether It occurs in two tautomeric forms $PhNO_2$ and PhONO **nitroso-*** PhNO = 107 08 Colorless monoclinic prisms, m 67 5, insoluble in water, soluble in alcohol or ether **nitroxy-** $PhNO_3$ Phenyl nitrate **penta amino-** See *pentamino-* **pentabromo-*** C_6HBr_5 = 472 64 Colorless needles m 160, insoluble in water, slightly soluble in alcohol or ether, soluble in benzene **pentachloro-*** C_6HCl_5 = 250 34 Colorless needles, $d_{21°}$ 0 769, m 85, b 275, insoluble in water, slightly soluble in alcohol, soluble in ether or benzene **pentaethyl-*** $C_6H(C_2H_5)_5$ = 218 21 A colorless liquid, $d_{19°}$ 0 899, m −20, b 277, insoluble in water **pentamethyl-*** $C_6H(CH_3)_5$ = 148 21 White crystals, m 53, b 230, insoluble in water **pentamino-** $C_6H(NH_2)_5$ = 153 17 Colorless needles, soluble in water, insoluble in alcohol or ether **phenyl-** Biphenyl **propenyl-** Allyl b **tetrahydro-** Cyclohexene **tetrahydroxy-** Apionol **tetramethyl-*** $C_6H_2Me_4$ = 134 3 **1 2 3 4-** Prehnitene **1 2 3 5-** Isodurene **1 2 4 5-** Durene **trihydroxy-** $C_6H_3(OH)_3$ = 126 2 **1 2 3-** Pyrogallol **1 2 4-** Benzenetriol **1 2 5-** Phloroglucinol **trimethyl-*** $C_6H_3Me_3$ **1 2 3-** Hemimellitene **1 2 4-** Pseudocumene **1 3 5-** Mesitylene **trinitro-** See *trinitrob* **trinitro-triazido-** $C_6(NO_2)_3(N_3)_3$ = 336 09 Greenish-yellow solid, m 131, insoluble in water soluble in acetone, used as a detonator and substitute for mercury fulminate **vinyl-** Styrene



(*Kekule*) (*Claus*) (*Ladenburg*) (*Dewar*)



(*Armstrong*) (*Thiele*) (*Split valency*)

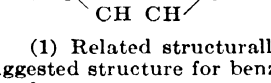


(*Kekule*) (*Baeyer*) (*Koerner*)

Benzene structure

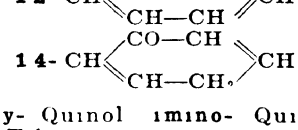
b arsonic acid $C_6H_7O_3As$ = 201 01 Phenyl- arsonic acid $PhAsO(OH)_2$ Used as a reagent for Sn, Zr and Th **amino-** Arsanilic acid **b azimide** See *benzotriazole* **b azoaniline** See *diazoamino benzene* **b azobenzene** See *azobenzene* **b azo-α-naphthylamine** $C_{16}H_{13}N_3$ = 247 21 $PhN\ NC_{10}H_6NH_2$ Red needles, m 123, soluble in alcohol, ether, or benzene Used in organic synthesis **b carbinol** Benzyl alcohol **b carbonal*** Benzaldehyde **b carbonamidine*** Benzamidine **b carbonitrile*** Benzonitrile **b carboxylic acid*** Benzoic acid **b diamine** Phenylenediamine **b diazonium chloride** $Ph\ NClN$ A product formed by diazotizing aniline with nitrous acid in a strongly acid solution It hydrolyzes to b diazonium hydroxide, and is explosive when dry **b diazonium hydroxide** $PhN\ N\ OH$ An intermediate in the formation of diazoaminobenzene from aniline **b dibromide** See *dibromo-b* **b dicarbinol** Xylenediol **b dicarbonal*** Phthalaldehyde **b dicarbonitrile*** Phthalonitrile **b dicarboxylic acid*** $C_6H_4(COOH)_2$ **1 2-** or **o-** Phthalic acid **1 3-** or **m-** Isophthalic acid **1 4-** or **p-** Terephthalic acid **b dichloride** Dichloro b **b diol*** $C_6H_4(OH)_2$ **1 2-** or **o-** Pyrocatechol **1 3-** or **m-** Same as Resorcinol **1 4-** or **p-** Hydroquinol **b disulfochloride** $C_6H_4(SO_2Cl)_2$ = 275 10 A colorless, viscous liquid, d 0 8791, m 5, b 80 2, slightly soluble in water, soluble in alcohol or ether Used in the manufacture of dyes **b disulfonic acid** $C_6H_4(SO_3H)_2$ A group of three isomeric **acids,** used in organic synthesis **b disulfoxide** $C_{12}H_{10}O_2S_2$ = 250 1 $PhSO\ SOPh$ Colorless crystals, m 45 **b dithiol** Phenylene dimercaptan **b hexabromide** $C_6H_6Br_6$ = 457 84 Hexabromocyclohexane* White monoclinic crystals, m 212, slightly soluble in alcohol or ether Cf *hexabromo* b **b hexacarboxylic acid** $C_6(COOH)_6$ Mellitic acid **b hexachloride** $C_6A_6Cl_6$ = 290 78 Hexachlorocyclohexane* Colorless monoclinic prisms, d 1 87, m 157, b $_{345mm}$218, soluble in water, alcohol or ether Cf *hexachloro b* **b hexaiodide** $C_6H_6I_6$ = 839 58 Hexaiodocyclohexane* Colorless crystals Cf *hexaiodo b* **b indone** Aposafranone **b induline** Aposafranine **b methylal** Benzaldehyde **b monosulfonic acid** b sulfonic acid **b nucleus** See *b ring* **b pentacarboxylic acid*** $C_6H(COOH)_5$ = 298 05 Colorless crystals, decomp 238, soluble in water **b pentamine*** $C_6H(NH_2)_5$ = 153 1 Pentaaminobenzene Colorless needles very soluble in water **b positions** See *b ring* **b ring** The graphical representation of the benzene structure, which is generally a hexagon with numbers representing the carbon atoms as in fig a, illustrating the double bonds as in fig b, indicating the double bonds by heavier lines, as in fig c, or in the more explicit structure symbol, fig d **b series.** A group of aromatic hydrocarbons and homologues of benzene of the general formula C_nH_{2n-6} **b siliconic acid*** C_6H_5SiOOH = 138 11 Silicobenzoic acid Glassy scales, m 92, insoluble in water **b structure** The theories of the arrangement of the carbon atoms in the benzene molecule are fig e—the plane formula of Kekulé (1865), fig f—the diagonal formula of Claus (1867), fig g—the prism formula of Ladenburg (1869), fig h—the bridge formula of Claus (1870), fig i—the centric formula of Armstrong, developed by Baeyer (1892), and fig j—the partial valence formula of Thiele (1899) One modern conception is that of a dynamic formula, as in fig k, in which the carbon atoms are joined by one bond and a shifting bond or each pair of carbon atoms possesses a doublet of electrons and a shifting doublet of electrons, the later oscillating or rotating around the ring from atom to atom See *Pauling* structure **(geometrical-)** An arrangement of tetrahedra which illustrates the arrangement of the atoms in the benzene molecule, as fig l—Kekule's fig m—Baeyer's, and fig n—Koerner's centroid arrangement **b sulfamide** See *b sulfonic* amide **b sulfide** Phenyl sulfide **b sulfinic acid** $C_6H_6O_2S$ = 142 1 $PhSO\ OH$, which is isomeric with b sulfonyl Colorless prisms, m 83, decomp 100 soluble in water, alcohol or ether **b sulfochloride** B sulfonic chloride **b sulfonanilide** $C_{12}H_{11}O_2NS$ = 233 2 $Ph\ SO_2\ NH\ Ph$ **b sulfone amide*** See *b sulfonic amide* **b sulfone chloride** See *b sulfonic chloride* **b sulfonic acid*** $C_6H_6O_3S \cdot 1\frac{1}{2}H_2O$ = 185 2 $PhSO_2\ OH$ Colorless leaflets m 65, b 135, soluble in water or alcohol insoluble in ether **b sulfonic amide** $PhSO_2NH_2$ = 157 2 B sulfamide, b sulfoneamide White lustrous plates, m 156 (decomp), soluble in water, alcohol, or ether **b sulfonic chloride** $PhSO_2Cl$ = 176 6 B sulfone chloride b sulfonylchloride* A colorless, oily liquid, d 1 384, m 14, b 251 insoluble in water miscible with alcohol or ether Used as a reagent for amines **b sulfonic hydroxamide** $PhSO_2NHOH$ = 173 2 Benzsulf-hydroxamic acid Colorless crystals, m 126 **b sulfonitramide** $C_6H_6O_4N_2S$ = 202 2 The compound $PhSO_2NHNO_2$ **b sulfonyl** The monovalent acyl radical derived from b sulfonic acid $Ph\ SO_2$- The isomer of b sulfinic acid **b sulfoxide** $C_{12}H_{10}OS$ = 218 14 Ph_2SO_2 Colorless crystals m 128, insoluble in water, soluble in alcohol or ether **b tetracarboxylic acid*** $C_6H_2(COOH)_4$ **1 2 3 4-** or **v-** Prehnitic acid **1 2 3 5-** or **a-** Mellophanic acid **1 2 4 5-** or **s-** Pyromellitic acid **b tetrol** Tetrahydroxy b **b tricarboxylic acid*** $C_6H_3(COOH)_3$ **1 2 3-** or **v-** Hemimellitic acid **1 2 4-** or **a-** Trimellitic acid **1 3 5-** or **s-** Trimesic acid **b triol*** $C_6H_3(OH)_3$ = 126 2 Hydroxyquinol hydroxyhydroquinone **1 2 4-** Colorless crystals m 140 5 **1 2 3-** or **v-** Pyrogallol **1 3 5-** or **s-** Phloroglucinol **b trisulfonic acid*** $C_6H_6O_9S_3$ = 318 3 $C_6H_3(SO_2OH)_3$ Colorless, deliquescent crystals, used in organic synthesis

benzenimine C_6H_7N = 93 3 Dihydroiminobenzene



benzenoid (1) Related structurally to benzene (2) A suggested structure for benzene involving 6 carbonoids, q v

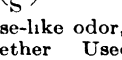
benzenone C_6H_6O = 94 05 Dihydroketobenzene



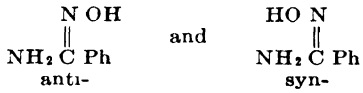
hydroxy- Quinol **imino-** Quinonimine **methyl-** Toluenone

benzenyl The trivalent radical, PhC≡, derived from toluene

benzenylamidine Benzamidine

benzenylamidothiophenol $C_{13}H_9NS$ = 211 1 Benzenylaminothiophenol, μ-phenylbenzothiazole  Yellow needles, with a pleasant rose-like odor, m 115, b 360, soluble in alcohol or ether Used in perfumery

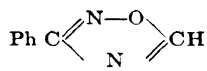
benzenylamidoxime $C_7H_8ON_2$ = 136 20 Benzamideoxime, PhC(NH₂) NOH, which occurs in two isomeric forms



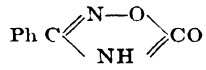
Colorless crystals m 89 **acetyl-** PhC(NH₂) NO-COMe A colorless liquid or crystalline masses, m 16

benzenylamino- See *benzenylamido-*

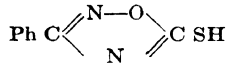
benzenylazoxime $C_8H_6ON_2$ = 146 20 *3-*Phenyl-*1 2 4*-oxdiazole The heterocyclic compound



b ketone $C_8H_6O_2N_2$ = 162 20 Benzenylcarbonyl azoxime,



Colorless crystals, m 198 **b thiocarbino** $C_8H_6ON_2S$ = 178 14 Benzenylthiocarbonyl azoxime,



Colorless crystals, m 131

benzenylcarbonylazoxime Benzenylazoxime ketone

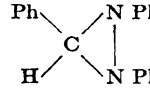
benzenylhydrazidine $C_7H_9N_3$ = 135 10 Amidrazone, PhC NH(NHNH₂)

benzenyltetrazoic acid Phenyltetrazole

benzenyltrichloride Benzotrichloride

benzerythrene $C_{24}H_{18}$ = 306 1 4-*pp'*-Diphenylbiphenyl The hydrocarbon, $PhC_6H_4C_6H_4Ph$

benzhydrazoin $C_{19}H_{16}N_2$ = 272 2



Colorless crystals, m 55

benzhydrol Benzohydrol **b ether** $C_{26}H_{22}O$ = 350 31 $(Ph_2CH)_2O$ Colorless crystals, m 109, b $_{15mm}$ 267, sparingly soluble in water, soluble in alcohol or ether

benzhydroxamic See *benzohydroxamic*

benzidam Aniline

benzidine $C_{12}H_{12}N_2$ = 184 1 Bianiline, benzidine base, p-diamino-diphenyl, *pp'*-bianiline The compound $NH_2C_6H_4C_6H_4NH_2$ White or slightly grayish scales, or a crystalline powder, m 133, b 401, slightly soluble in water, soluble in alcohol, ether or boiling water Used as a reagent for detecting sulfates in water analysis and the identification of blood, and a delicate reagent for metals in their higher valencies, also in organic synthesis **dimethoxy-** Dianisidine **dimethyl-** Tolidine

b conversion The formation of b from hydrazobenzene by boiling with mineral acids

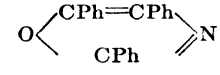
b dicarboxylic acid Diaminophenic acid

b sulfate $C_{12}H_{12}N_2H_2SO_4$ = 282 3 A white crystalline powder, soluble in water or alcohol It has similar uses to benzidine **b sulfone** $C_{12}H_{12}N_2SO_2$ = 246 22 Dibenzothiophene-2 7-diamine-9-dioxide, $(NH_2C_6H_3)_2SO_2$ Colorless crystals, m 350, insoluble in water, alcohol or ether **b test** Adler's reaction, for the detection of blood pigment Add 1 cc glacial acetic acid to 10 cc suspected liquid, and shake with 4 cc of ether Transfer the ether to another test tube containing 0 5 cc benzidine solution in glacial acetic acid and 2 cc hydrogen peroxide If blood is present, a green or bluish color will develop which turns to a dirty purple in a few minutes Metallic iron, lead oxides and many other substances also give this test

benzidino The monovalent radical, $NH_2C_6H_4-C_6H_4NH$—, derived from benzidine

benzil $C_{14}H_{10}O_2$ = 210 15 Dibenzoyl, diphenylglyoxal, bibenzoyl, diphenyldiketone, PhCO COPh Yellow needles, d 1 521, m-95 2, b 348, insoluble in water, soluble in alcohol or ether Used as a reagent, and in organic synthesis **bisazo-** See *bisazobenzil* **bishydrazi-** See *bishydrazibenzil* **dimethoxy-** Anisil **dimethyl-** Tolil

benzilam $C_{21}H_{15}ON$ = 297 2 Triphenyloxazol The heterocyclic compound



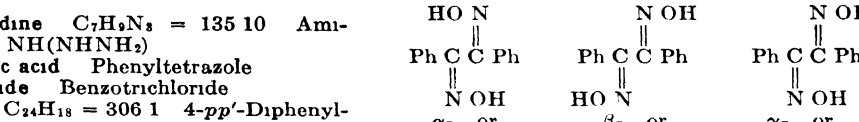
benzilamphioxime Benzildioxime, gamma-

benzilanilide Benzylanilide

benzilantioxime Benzildioxime, alpha-

benzildianil $C_{26}H_{20}N_2$ = 360 2 PhC N(Ph)-(Ph)N CPh Colorless crystals, m 142

benzildioxime $C_{14}H_{12}O_2N_2$ = 240 1 The compounds,

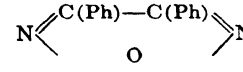


Crystalline solids, insoluble in water, soluble in alcohol or ether, decomp by heat It is a delicate reagent for nickel **b peroxide** $C_{14}H_{10}O_2N_2$ = 238 2 $Ph_2C_2N_2O_2$ Colorless crystals m 114

benzilic acid $C_{14}H_{12}O_3$ = 228 17 Diphenylglycolic acid, α-phenylmandelic acid The monobasic hydroxyacid $Ph_2C(OH)COOH$ White monoclinic crystals, m 150, slightly soluble in water, soluble in alcohol or ether

benzilidene Benzal **b acetophenone** $C_{15}H_{12}O$ = 208 1 PhCH CH COPh Colorless crystals m 58, b 346 **b anil** Benzalaniline **b hydrazine** Benzal hydrazine **b phthalide** Benzal phthalide

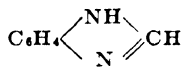
benzilmonoxime $C_{14}H_{10}N_2O$ = 225 17 The compound



A crystalline substance, which occurs in two isomeric forms *alpha*, m 137, *beta*, m 114 Both are insoluble in water and soluble in alcohol or ether

benzilsynoxime Benzildioxime, beta-

benzimidazole $C_7H_6N_2$ = 118 2, 1 3-benzodiazole, o-phenylene formamidine, benzoglyoxaline The heterocyclic compound

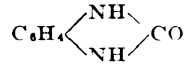


Colorless crystals, m 167 Cf *naphthimidazole*

benzylene- Pseudo isoindolebenzimideazole

methyl- $C_7H_6N_2CH_3$ = 132 1 o-phenyleneacetamidine, mesomethylbenzimidazole Colorless crystals, m 176

benzimidazolone $C_7H_6ON_2$ = 134 2 o-phenylene-urea



Colorless crystals, m 308 **thio-** Phenylenesulfone

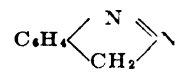
benzimidazolyl The monovalent radical $C_7H_5N_2$—, derived from benzimidazole

benzimido The monovalent radical, PhC(NH)—

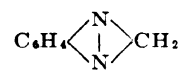
benzin, benzine Benzoline, gasoline, petroleum benzin A mixture of hydrocarbons obtained from the second distillate in the fractional distillation of crude petroleum, it consists of the fraction b 70–90 A clear colorless liquid, d 0 640–0 675, insoluble in water, miscible with alcohol, ether, oils or carbon disulfide Used as a solvent for fats, oils, resins, alkaloids and rubber, as a cleaning agent for textiles, and as a motor fuel Cf *benzene*

benzinduline Aposafranine

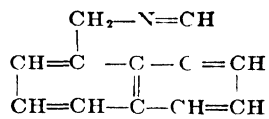
benzisodiazole $C_7H_6N_2$ = 118 2 **1 2-** Indiazene The heterocyclic compound



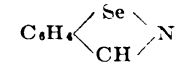
1 3- The compound



benzisoquinoline $C_{12}H_9N$ = 167 05 The heterocyclic compound

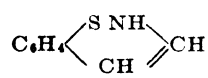


benzisoselenazole C_7H_5NSe = 182 3 The heterocyclic compound

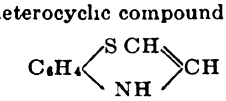


benzisosulfonazole Saccharin

benzisothiazine C_8H_7NS = 149 1 **1 2-** The heterocyclic compound

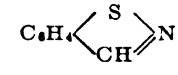


1 4- The heterocyclic compound

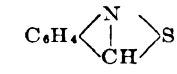


Cf *benzothiazine*

benzisothiazole C_7H_5NS = 135 1. Benzo-1-thiazole The heterocyclic compound

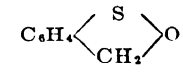


pseudo- Benziso-ψ-thiazole The heterocyclic compound



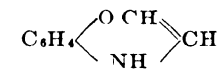
Cf *benzothiazole*

benzisothioxole C_7H_6OS = 138 2 The heterocyclic compound

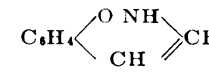


benzisotriazole 1 -2 3-Benzotriazole

benzisoxazine C_8H_7ON = 133 1 **1 4-** The heterocyclic compound

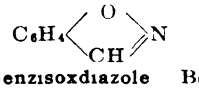


1 2- The heterocyclic compound



Cf *benzoxazine*

benzisoxazole C_7H_5ON = 119 1 Indoxazene isoindoxazene The heterocyclic compound



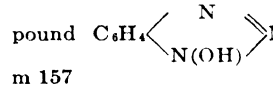
$\beta\gamma$- Anthranil

benzisoxdiazole Benzofurazan

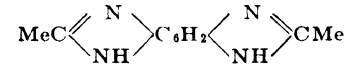
benzo- A prefix indicating the divalent radical C_6H_4=, derived from benzene

benzoate A salt of benzoic acid, an organic compound of the type PhCOOR or PhCOOM

b of soda See *sodium benzoate*

benzo-azimidole $C_6H_5ON_3$ = 135 1 The compound  Colorless crystals m 157

benzobis-m-methylimidazole $C_{10}H_{10}N_4$ = 186 3 The heterocyclic compound



Colorless crystals, m 145

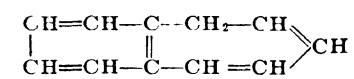
benzocaine $C_9H_{11}O_2N$ = 165 2 Ethyl *p*-aminobenzoate, anesthesin, $NH_2C_6H_4COOEt$ Colorless, odorless, tasteless, crystals m 90, insoluble in water, soluble in alcohol benzene or acids, used as a local anesthetic

benzocarbolic acid Phenylbenzoate

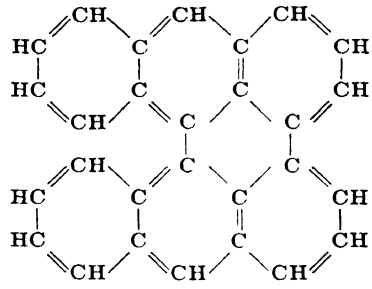
benzocinnoline *5 6*-Naphthisodiazine

benzocoumaran Naphthofuran

benzocycloheptadiene $C_{11}H_{10}$ = 142 07 The hydrocarbon



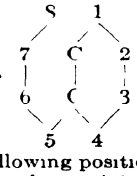
benzodianthrene. $C_{28}H_{16}$ = 352 2 The aromatic hydrocarbon



Cf *naphthodianthrene*

benzodianthrone Helianthin

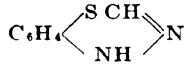
benzodiazine $C_8H_6N_2$ = 130 06 Benzdiazine A group of nine isomeric, heterocyclic compounds of the type



They contain 2N atoms in the following positions **1 2-** Cinnoline **1 3-** Quinazoline **1 4-** Quinoxaline **1 5-** Pyridopyridine **1 8-** Naphthyridine **2 3-** Phthalazine **alpha-** Cinnoline **beta-** Phthalazine **para-** Quinoxaline

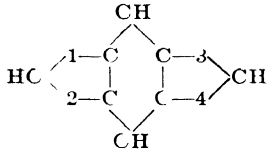
benzodiazole $C_7H_6N_2$ = 118 1 **1 2-** Isoindazole **2 1-** Indazole **1 3-** Benzimidazole

benzodiazthine $C_7H_6N_2S$ = 150 1 Phenylsulfocarbizine The heterocyclic compound

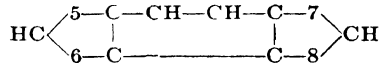


Colorless crystals, m 129

benzodifuran $C_{10}H_6O_2$ = 158 0 A group of

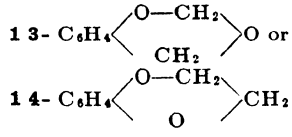


and



five isomeric, heterocyclic compounds of the types shown, in which the numerals indicate the position of two oxygen atoms and two CH-groups as follows **o-alpha-** Oxygen at 6 and 8, CH-groups at 5 and 7 **m-alpha-** Oxygen at 1 and 3, CH-groups at 2 and 4 **m-beta-** Oxygen at 5 and 7, CH-groups at 6 and 8 **p-alpha-** Oxygen at 6 and 7, CH-groups at 5 and 8 **p-beta-** Oxygen at 2 and 3, CH- groups at 1 and 4

benzodioxane, -an $C_8H_8O_2$ = 136 06 A group of compounds, as,

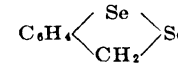


benzodioxazine $C_7H_5O_2N$ = 135 1 A group of heterocyclic compounds of the benzodiazine type, but containing two oxygen atoms and one nitrogen atom, as, **1 2 3-** Oxygen at position 1 and 2, nitrogen at 3 **1 2 4-** Oxygen at position 1 and 2, nitrogen at 4 **1 4 2-** Oxygen at position 1 and 4, nitrogen at 2

benzodioxdiazine $C_6H_4N_2O_2$ = 136 1 A group of heterocyclic compounds, similar to benzodiazine, but which contain two oxygen atoms and two nitrogen atoms, as, **1 2 3 4-** Oxygen at position 1 and 2, nitrogen at 3 and 4 **1 4 2 3-** Oxygen at position 1 and 4, nitrogen at *2* and 3 **2 4 1 3-** Oxygen at position 2 and 4 nitrogen at 1 and 3

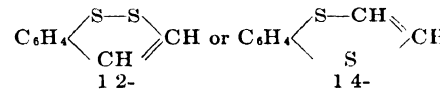
benzodioxtriazine $C_5H_3O_2N_3$ = 137 1 A group of heterocyclic compounds, similar to benzodiazine, but which contain two oxygen and three nitrogen atoms, as, **1 2 3 4 5-** Oxygen at position 1 and 2, nitrogen at 3, 4, and 5 **1 2 3 4 8-** Oxygen at position 1 and 2, nitrogen at 3, 4, and 8 **1 2 4 5 8-** Oxygen at position 1 and 2, nitrogen at 4, 5, and 8

benzodiselenole $C_7H_6Se_2$ = 248 4 The heterocyclic compound

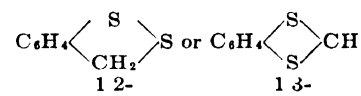


benzodisulfole Benzodithiole

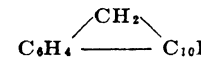
benzodithin $C_8H_8S_2$ = 168 2 The heterocyclic compounds



benzodithiole $C_7H_6S_2$ = 154 2 Benzodisulfole The heterocyclic compounds

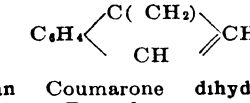


benzofluorene $C_{17}H_{12}$ = 216 1 A group of aromatic hydrocarbons of the type



1 2- Chrysofluorene

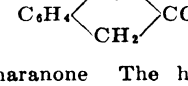
benzofulvene $C_{10}H_8$ = 128 1 1-Methyleneindene The aromatic hydrocarbon



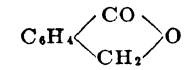
benzofuran Coumarone **dihydro-** Coumaran **dihydroketo-** Benzofuranone

benzofurancarboxylic acid Coumarilic acid

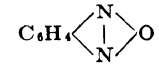
benzofuranone $C_8H_6O_2$ = 134 1 **1(2)-** The heterocyclic compound



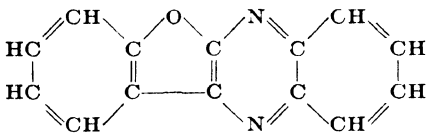
2(1)- Coumaranone The heterocyclic compound



benzofurazan $C_6H_6ON_2$ = 120 1 Benzisoxdiazole The heterocyclic compound



benzofuroquinoxaline $C_{14}H_7ON_2$ = 219 1 The heterocyclic compound



benzofuryl The monovalent radical, C_8H_5O—, derived from coumarone

benzoglycollic acid Amygdalic acid

benzoglyoxaline Benzimidazole

benzohydrol $C_{13}H_{12}O$ = 184 09 Diphenylcarbinol, Ph_2CHOH Colorless needles, m 68, b 298 5, insoluble in water, soluble in alcohol or ether **tetramethyl diamino-** *Michler's* hydrol

benzohydroxamic acid $C_7H_7NO_2$ = 137 11 A compound existing in two isomeric types *anti-* N OH HO N or *alpha-* ‖ and *syn-* or *beta-* ‖ HO C Ph HO C Ph *Syn-* m 124

benzohydryl The monovalent radical, $(C_6H_5)_2$-CH— or Ph_2CH—, derived from diphenylmethane **b amine** $C_{13}H_{13}N$ = 183 18 Ph_2-CH NH_2 Colorless liquid, b 288 **b benzoic acid** $C_{14}H_{12}O_2$ = 288 2 Ph CHOH C_6H_4CO-OH A crystalline solid, m 164, decomp if further heated, slightly soluble in water soluble in alcohol or ether **b hydrazine** Ph_2CHNH-NH_2 **b hydroxylamine** $C_{13}H_{14}N_2O$ = 214 11 Ph_2CH NH NHOH Colorless crystals, m 78

benzohydrylidene Diphenylmethane

benzoic acid $C_7H_6O_2$ = 122 09 Phenylformic acid, benzenecarboxylic acid* The monobasic acid, Ph COOH White needles, d 1 266, m 121 2, b 249 3, sparingly soluble in water, soluble in alcohol or ether It occurs in benzoin and cranberries, and is poisonous to man It is an antipyretic, antiseptic or expectorant, used in calico printing and in the manufacture of aniline dyes **acetylamino-** CH_3CONH C_6H_4COOH = 179 13 Acetamido b **o-** Colorless needles, m 185, slightly soluble in water or alcohol **m-** White crystals, decomp 248, slightly soluble in alcohol, water or ether **p-** Colorless needles decomp 250, slightly soluble in water, alcohol or ether **aldehyde-** CHO C_6H_4COOH = 150 09 **o-** White leaflets, d 1 404, m 97 2, b 191, soluble in water, alcohol or ether **m-** White needles, m 164, **p-** Colorless needles, m 246, soluble in water, alcohol or ether **amino-** NH_2 C_6H_4-COOH = 137 09 **o-** Anthranilic acid Yellow leaflets, m 144, slightly soluble in water, soluble in alcohol or ether **m-** Benzaminic acid Yellow crystals, m 174, slightly soluble in water, alcohol or ether **p-**Dracilic acid, vitamin B_x, anticanitic factor, growth factor for bacteria It is part of the vitamin B complex (q v), and occurs in yeast, a deficiency of it causes prematurely grey hair Yellow crystals m 186, slightly soluble in alcohol, water or ether **4-amino-3 5-dinitro-** Chrysanisic acid **azo-** See *azo* **azodi-** Azobenzoic acid **azoxy-** See *azoxy-* b **bromo-** BrC_6H_4COOH = 201 04 **o-** Colorless needles, m 150, slightly soluble in water, soluble in alcohol or ether **m-** White needles, m 155, sparingly soluble in water, soluble in alcohol or ether **p-** Colorless monoclinic prisms, m 251, slightly soluble in water, soluble in alcohol or ether **carbamyl-** Phthalamic acid **carbamylphenyl-** Diphenamic acid **carboxyformyl-** Phthalonic acid terephthalonic acid **chloro-** ClC_6H_4-COOH = 156 53 **o-** Colorless, rhombic crystals, d 1 540, m 137, sparingly soluble in water, soluble in alcohol or ether **m-** White crystals, m 153°C, slightly soluble in water and soluble in alcohol and ether **p-** Colorless monoclinic crystals, d_{24}°1 541, m 236, slightly soluble in water, soluble in alcohol or ether **dichloro-** $Cl_2C_6H_3COOH$ = 190 97 **a-** or **2 5-** Colorless needles, m 156, b 301, slightly soluble in water, soluble in alcohol or alkalis **v-** or **2 6-** White needles m 126 5, soluble in alcohol or alkalis **s-** or **3 4-** White needles, m 203, sparingly soluble in water or alcohol, soluble in alkalis **dihydroxy-** $(OH)_2C_6H_3COOH$ = 154 09 **2 3-** Pyrocatechoic acid (+$2H_2O$ = 190 12) Colorless needles, m 204, soluble in water **2 4-** (+$3H_2O$ = 208 14) β-Resorcylic acid White needles, m 206, slightly soluble in water, soluble in alcohol or ether **3 5-** (+$1\frac{1}{2}H_2O$ = 181 12) α-Resorcylic acid Colorless prisms, m 232 soluble in water, alcohol or ether **2 5-** Gentisic acid Colorless needles, m 199, soluble in water, alcohol or ether **3 4-** Protocatechuic acid **2 6-** γ-Resorcylic acid Colorless needles, m 167 **dihydroxymethyl-** Orsellic acid **dimethoxy-** Veratric acid **dimethoxyformyl-** Opianic acid **dimethoxyhydroxy-** Syringic acid **dimethyl-** $Me_2C_6H_3COOH$ = 150 13 **2 3-** *v*-Xylic acid Colorless prisms, m 144, soluble in water or alcohol **2 4-** Xylic acid Colorless monoclinic crystals, m 126, b 268, insoluble in water soluble in alcohol or ether **2 5-** Isoxylic acid White needles m 132, b 268, insoluble in water, soluble in alcohol **2 6-** White needles, m 116, b 274 5, slightly soluble in water, soluble in alcohol or ether **3 4-** White prisms, m 163, slightly soluble in water or alcohol **3 5-** 1 3 5-mesitylinic acid White monoclinic crystals m 166, very slightly soluble in water soluble in alcohol or ether **dinitro-** $(NO_2)_2$-C_6H_3COOH = 212 15 **2 3-** Colorless crystals, m 201 **2 4-** Colorless prisms, m 179, sparingly soluble in water, soluble in alcohol **2 5-** Colorless needles m 177, slightly soluble in hot water **2 6-** Colorless needles m 202, soluble in hot water **3 4-** Colorless needles, m 163, slightly soluble in water, soluble in alcohol or ether **3 5-** Colorless crystals, m 203°C, soluble in alcohol or water **ethoxy-** Et-O C_6H_4 COOH = 166 13 **o-** A colorless liquid or crystals, m 19, slightly soluble in water **m-** Colorless needles, m 137, soluble in water, alcohol or ether **p-** Colorless needles, m 195, very slightly soluble in hot water **ethyl-** EtC_6H_4COOH = 150 13 **o-** Colorless needles m 68, b 259, sparingly soluble in water, soluble in alcohol or ether **m-** Colorless needles, m 47, very slightly soluble in water **p-** Colorless leaflets, m 112, soluble in hot water, alcohol or ether **formyl-** Phthalaldehydic acid **formyl-dimethoxy-** Opianic acid **disulfo-** Dithiobenzoic acid **fluoro-** Fluobenzoic acid **hexahydro-** $C_6H_{11}COOH$ = 128 14 Naphthenic acid, cyclohexane carboxylic acid Colorless monoclinic crystals, d 1 048, m 30, b 233, slightly soluble in water, soluble in alcohol or ether **hydrazinehydroxy-** Orthin **hydrazino-** NH_2NH C_6H_4COOH = 152 08 **o-** Colorless crystals, m 155 **m-** Colorless crystals, m 231, **p-** Colorless needles, m 258, soluble

in alcohol **hydrazo-** $(NH\ C_6H_4COOH)_2$ = 272 25 **o-** Colorless leaflets, m 205, insoluble in water and soluble in alcohol or ether **hydroxy-** $HO\ C_6H_4COOH$ = 138 08 **o-** Salicylic acid **m-** Colorless rhombic crystals m 201 03, slightly soluble in water, soluble in ether **p-** Colorless monoclinic crystals, $d_{22°}$ 1 404, m 213, insoluble in water, slightly soluble in alcohol or ether **hydroxydimethoxy-** Syringic acid **hydroxy-methoxy-** Vanillic acid **hydroxymethyl-** Cresotic acid **isopropyl-** Cumic acid **methoxy-** $MeO\ C_6H_4COOH$ = 152 10 **o-** White monoclinic leaflets, d 1 180, m 98 5, b 200, sparingly soluble in water **m-** White needles, m 102, b 245, soluble in water or alcohol **p-** Anisic acid **methyl-** Toluic acid **methylene dioxy-** Piperonylic acid **nitro-** $NO_2C_6H_4COOH$ = 167 08 **o-** Colorless needles, d 1 575, m 147 5, slightly soluble in water, soluble in alcohol or ether **m-** Silky needles, d 1 494, m 141 4, sparingly soluble in water, soluble in alcohol or ether **p-** White scales, d 1 550, m 242 4, sparingly soluble in water or alcohol, soluble in ether or chloroform **pentamethyl-** C_6Me_5COOH = 192 19 Colorless needles m 210, slightly soluble in water, soluble in alcohol **phenyl-** PhC_6H_4COOH = 198 15 **o-** Colorless needles, m 111, b 343, sparingly soluble in water, soluble in alcohol **m-** White leaflets, m 160, slightly soluble in water, soluble in alcohol or ether **p-** White needles, m 219, insoluble in water, soluble in alcohol or ether **sulfamine-** $NH_2SO_2C_6H_4COOH$ = 201 1 **o-** Colorless crystals, m 167 The anhydride is saccharin **m-** Colorless crystals, m 238 **p-** Colorless crystals, decomp 280 **sulfo-** $HOSO_2\ C_6H_4COOH,3H_2O$ = 256 18 **o-** Colorless crystals, m 250, soluble in water or alcohol, insoluble in ether **m-** (+ $2H_2O$ = 236 16) Colorless crystals, m 141 **p-** Colorless needles, m 259, soluble in water, alcohol or ether **tetrahydro-** C_6H_9COOH = 126 08 A solid, d 1 072 **tetramethyl-** Me_4C_6HCOOH = 178 1 **2 3 4 5-** Colorless crystals, m 165 **2 3 5 6-** Colorless crystals, m 127 **trihydroxy- 2 3 4** - See *trihydroxy* **3 4 5-** Gallic acid **trimethoxy-** Asaronic acid **trimethyl-** $Me_3C_6H_2COOH$ = 164 1 **2 3 4-** Prehnitilic acid Colorless crystals, m 167 **3 4 5-** alpha-i-durylic acid Colorless crystals, m 215 **2 3 5-** gamma-i-durylic acid Colorless crystals, m 127, **2 4 5-** Durylic acid Colorless crystals, m 150 **2 4 6-** beta-i-durylic acid, mesitylene carboxylic acid Colorless crystals, m 152

b acid anhydride $PhCO\ O\ COPh$ = 226 14 Colorless crystals, d 1 199, m 42, b 360, soluble in alcohol or ether It is a strong antiseptic **b alcohol** Benzyl alcohol **b aldehyde** Benzaldehyde **b amide** Benzamide **b anhydride** Benzoic acid anhydride **b ether** Ethylbenzoate **b sulfimide, b sulfinide** Saccharin **b trichloride** Benzotrichloride

benzoin (1) $C_{14}H_{12}O_2$ = 212 17 Oxyphenyl benzoyl ketone, (ω)-benzyl alcoholphenyl ketone, phenyl benzoyl carbinol, bitter almond oil camphor $PhCO\ CH(OH)Ph$ White hexagonal crystals, m 132, b 343 soluble in hot water, alcohol or ether It does not occur in gum benzoin It is an antiseptic, used in ointments (2) Benzoinum, gum benzoin The balsamic resin *Styrax* species See *b gum* **diisopropyl-** Cuminoin **dimethoxy-** Anisoin **hydro-** $PhCH(OH)CH(OH)Ph$ = 214 19 White leaflets, m 138, b 302, sparingly soluble in water, soluble in alcohol **i-hydro-** Colorless monoclinic crystals m 119 5, soluble in alcohol or ether

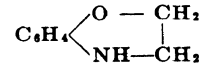
b condensation A reaction between two aromatic aldehydes under the influence of KCN to form water and a compound $X\ CH(OH)-CO\ X$ With benzaldehyde X is Ph, and the resulting compound in benzoin Cf *aldol* condensation **b gum** Benjamin gum benzoinam, kemenian (Malay), luban jawi (Arabic) *Siam-* The resin from *Styrax benzoin* and other species The chief constituents are benzoic acid, an essential oil and vanillin, used in perfumery and cosmetics *Sumatra-* The resin from *Styrax* species The chief constituents are cinnamic and benzoic acids, used for varnishes and in the manufacture of cinnamic acid **b oxime** $C_{14}H_{13}NO_2$ = 227 2 Phenyl-α-oxybenzyl ketoxime, $Ph\ CHOH\ C-NOH\ Ph$ (1) *d-* Colorless needles, m 132, $[\alpha]_D$ + 120 5 (2) *l-* White powder, m 164, $[\alpha]_D$ − 3 2 (3) *syn-d, l-* or β-crystals, m 99 (4) *anti-d, l-* or α- crystals, m 152, a very sensitive reagent for copper or molybdenum

benzoiodohydrin $C_{10}H_{10}O_2ClI$ = 324 4 Chloriodoglycerin benzoic ether, $PhCOOC_3H_5ClI$ A brownish fatty mass, soluble in alcohol, ether or benzene

benzol See *benzene* **b bichloride** See *benzene* dichloro- **b bromide** See *benzene*, bromo- **b chloride** See *benzene, chloro-*

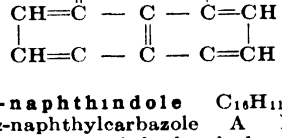
benzoline Benzine

benzomorpholine C_9H_9ON = 135 1 A colorless oily liquid, b 268



benzonaphthacene α- Dibenzanthracene β- Pentacene

benzonaphthene $C_{13}H_{10}$ = 166 07 The hydrocarbon



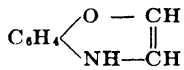
benzo-α-naphthindole $C_{16}H_{11}N$ = 217 1 Phenyl-α-naphthylcarbazole A heterocyclic system, isomeric with hydrindochroman

benzonaphthol Naphthol-benzoate

benzonitrile C_7H_5N = 103 08 Phenylcyanide, cyano-benzene, benzenecarbonitrile*, $PhCN$ A colorless liquid, d 1 008, m −13, b 191, miscible with alcohol or ether It resembles bitter almond oil in odor, used in the synthesis of dyes and drugs **amino-** $NH_2C_6H_4CN$ = 118 10 Anthranilo nitrile **m-** Colorless needles, m 53, b 289, slightly soluble in water, soluble in alcohol or ether **p-** Colorless needles, m 86, soluble in alcohol, water or ether **dimethyl-** Xylonitrile **hydroxy-** Salicylonitrile **methoxy-** Anisonitrile **methyl-** Tolunitrile **nitro-** $NO_2C_6H_4CN$ = 148 09 **o-** White silky needles, m 109, soluble in hot water, alcohol or ether **m-** Colorless needles, m 117, sparingly soluble in water, soluble in alcohol or ether **p-** White leaflets, m 147, slightly soluble in alcohol or water, soluble in ether or chloroform

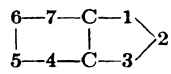
benzoparadiazine Quinoxaline

benzoparoxazine C_8H_7ON = 133 1 The heterocyclic system



2-phenyl- Colorless crystals, m 103

benzopentazole $C_4H_3N_5$ = 79 1 A group of heterocyclic compounds of the type



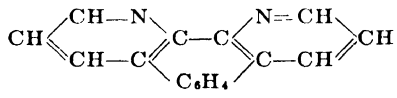
which contain five nitrogen atoms in the two rings The position of a NH group is indicated by the initial numeral thus **1 2 3 4 7-** NH at 1, N at 2 3 4 and 7, or **2 1 3 4 7-** NH at 2, and N at 1, 3, 4 and 7

benzoperoxide Commercial benzoyl peroxide

benzophenanthrazine Dibenzophenazine

benzophenanthrene (*a*-) Chrysene (*def*-) Pyrene (*l*) Triphenylene

benzophenanthroline $C_{16}H_{10}N_2$ = 230 2 The heterocyclic hydrocarbon



benzophenazine $C_{16}H_{10}N_2$ = 230 2 Naphthophenazine, phenonaphthazine The heterocyclic compound $C_{10}H_6\langle N \rangle C_6H_4$ Yellow

needles, m 142 5, insoluble in water

benzophenetide $C_{15}H_{20}O_2N$ = 246 5 ar'-ethoxybenzanilide, PhNH CO C_6H_4 OEt

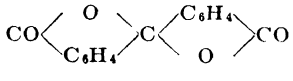
benzophenid Phenylbenzoate

benzophenol Phenyl benzoate

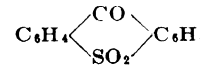
benzophenone $C_{13}H_{10}O$ = 182 12 Diphenylketone, *α*-oxodiphenylmethane, benzoylbenzene, Ph CO Ph Colorless, rhombic, prisms, occurring in four allotropic forms *α*- d 1 083, m 48 5, b 305, *β*- d 1 108 m 26 5 b 306 *γ*- m 46, *δ*- m −51 Insoluble in water, soluble in alcohol or ether It is a mild hypnotic, used in organic synthesis **benzoyl-** Phthalophenone **diamino-, dihydroxy-** See *di-* **nitro-** NO_2 C_6H_4COPh = 227 15 **o-** Orthonitrobenzophenone Colorless crystals m 105, slightly soluble in alcohol **m-** Metanitrobenzophenone Colorless needles, m 94, soluble in alcohol **p-** Paranitrobenzophenone White leaflets, m 138, soluble in alcohol **pentahydroxy-** Maclurin **tetramethyldiamino-** *Michler's* ketone **thio-** Thiobenzophenone **trihydroxy-** $C_{13}H_{10}O_4$ = 230 08 Benzophlorogluciol *2 6 2'-* A white solid m 133

b carboxylic acid Benzoylbenzoic acid

b dicarboxylic acid $C_{15}H_{10}O_5$ = 270 16 The dibasic keto-acid, C_6H_4COOH C O C_6H_4 **2 2-** or **o o-** Ortho-ortho-b Colorless crystals, m 150–200, sparingly soluble in water, soluble in alcohol or ether **b dicarboxylicdilactone** $C_{15}H_8O_4$ = 252 1 The spiro-compound



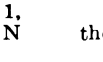
Colorless crystals m 212 **b oxime** Benzophenoxime **b sulfide** Thioxanthone **b sulfone** $C_{13}H_8O_3S$ The heterocyclic compound



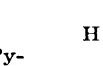
benzophenothiazine $C_{16}H_{11}NS$ = 248 15 Naphthophenothiazine, thiophenylnaphthylamine The heterocyclic compound $C_{10}H_7\langle S \rangle C_6H_4$

benzophenothioxine $C_{16}H_{10}OS$ = 250 15 The heterocyclic compound $C_{10}H_6\langle S \rangle C_6H_4$

benzophenoxazine $C_{16}H_{11}ON$ = 233 2 Naphthophenoxazine $C_{10}H_6\langle O \rangle C_6H_4$



iso- $C_{16}H_{10}ON$ = 232 2 $C_{10}H_7\langle O \rangle C_6H_4$

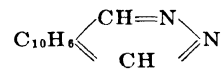


benzophenoxime $C_{13}H_{11}ON$ = 197 16 Benzophenone oxime, Ph_2C N OH White crystals, m 140, insoluble in water, soluble in alcohol

benzophloroglucinol $C_{13}H_{10}O_4$ = 230 12 **2-4 6-** trihydroxy benzophenone Ph CO C_6H_2-$(OH)_3$

benzophosphinic acid $C_7H_7O_3P$ = 202 13 HOOC $C_6H_4PO(OH)_2$ Colorless crystals, m 300, soluble in water

benzophthalazine $C_{12}H_8N_2$ = 180 1

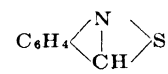


benzopinacol $C_{26}H_{22}O_2$ = 366 31 Tetraphenylethylglycol, benzopinacone, *α α'*-bibenzohydrol, tetraphenyl-1 *2*-ethanediol Ph_2COH COH Ph_2 Colorless crystals, m 185, used in organic synthesis

benzopinacone Benzopinacol

benzo-pseudoselenazol C_7H_5NSe = 182 1 The heterocyclic compound $C_6H_4\langle N \rangle Se$

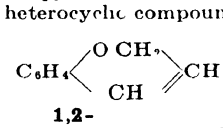
benzo-pseudo-thiazole C_7H_5NS = 135 1 The heterocyclic compound



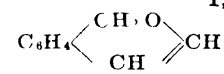
benzo-pseudoxazole Anthranil

benzopurpurin Ozamin 4B A red aniline dye, soluble in water, used for dyeing cotton It is the sodium salt of o-toluidinedisazo-binaphthylamine-sulfonic acid and is used as biological stain and indicator, changing at pH 4 0 from purple (acid) to scarlet (alkali)

benzopyran C_9H_8O = 132 06 A group of heterocyclic compounds *e g* ,



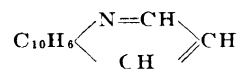
1,2- **1,4-**



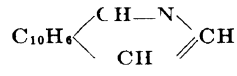
2,1-

dihydro- Chroman **keto-** Coumarin (1,2), or chromone (1,4)

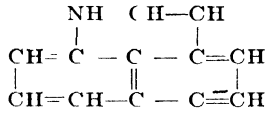
benzopyranyl The monovalent radical, C_9H_7O—, derived from benzopyran
benzopyrazine Quinoxaline
benzopyrazole Isoindazole
benzopyrazolon(e) Indazolone
benzopyrene $C_{20}H_{11}$ = 251 1 A hydrocarbon consisting of an anthracene ring with a naphthalene ring attached in the 1 2 position It is the principal carcinogen in coal tar pitch Cf *benzanthracene, benzopyrine*
benzopyridine Quinoline
benzopyrilium A group of compounds derived from benzopyran, the oxygen of which is assumed to be tetravalent
benzopyrine $C_{18}H_{15}O_3N_2$ = 310 16 Antipyrine benzoate Ph COOH $C_{11}H_{12}ON_2$ Cf *salipyrine, benzopyrene*
benzopyrone **1 2-** Coumarin **1 4-** Chromone **2 1-** Isocoumarin **dihydro- phenyl-** Flavonone **phenyl-** Flavone
benzopyrrole Indole
benzopyrylium Benzopyrilium
benzoquinol Quinol
benzoquinoline $C_{13}H_9N$ = 179 2 **6 7-** *α*-anthrapyridine The heterocyclic compound



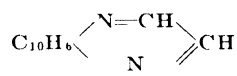
Colorless crystals m 275, soluble in alcohol **6 7-iso-** *β*-anthrapyridine



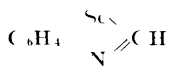
Colorless crystals m 166, soluble in alcohol **4 5-** or **meso-** $C_{13}H_9N$ = 167 2



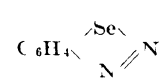
3 4- Phenanthridine
benzoquinone Quinone
benzoquinoxaline $C_{12}H_8N_2$ = 180 2 Naphthopyrazine The heterocyclic compound



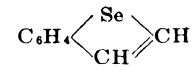
benzosalin $C_{14}H_{12}O_4$ = 256 1 Methyl benzoyl salicylate, benzoyl salicylic acid methyl ester, $C_6H_4(OMe)COO(PhCO)$ Fine white, crystalline powder of faintly aromatic odor m 85, slightly soluble in water Used as an antiseptic
benzoselenazole C_7H_5NSe = 182 1 The heterocyclic compound



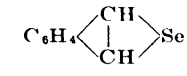
iso- Benzisoselenazole **pseudo-** Benzopseudoselenazole
benzoselenodiazole $C_6H_4N_2Se$ = 183 1 Isopiaselenol The heterocyclic compound



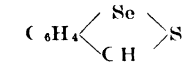
iso- Benzisoselendiazole, piaselenol The heterocyclic compound C_6H_4 Colorless, crystals, m 76
benzoselenofuran C_8H_6Se = 181 1 Selenonaphthene The heterocyclic compound



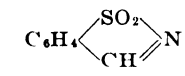
iso- Benzo-2-selenofuran The ring structure



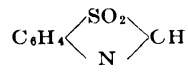
benzoselenothiole C_7H_6SSe = 201 1 The heterocyclic compound



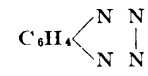
benzosol $C_{14}H_{12}O_3$ = 228 09 Guaiacol benzoate, $PhCOOC_6H_4OMe$ A colorless solid, m 61, used as disinfectant
benzosulfinide Saccharin
benzosulfonazole $C_7H_5O_2NS$ = 167 1 **1-** The heterocyclic compound



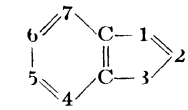
2- Benzisosulfonazole



benzosulfonazolone Saccharin
benzotetrazine $C_6H_4N_4$ = 132 2 The heterocyclic compound



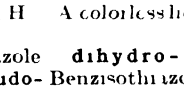
benzotetrazole $C_6H_4N_4$ = 120 2 A group of heterocyclic compounds of the type containing



four nitrogen atoms, one of which is NH The 1 3,4 6-compound is identical with purine (q v) in which, according to Fisher's notation, the atoms are numbered differently
benzothiazine C_8H_7NS = 149 2 A group of heterocyclic compounds, as

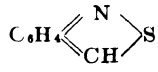
1 4,2- 1,3 2-

Cf *benzoisothiazine*
benzothiazole C_7H_5NS = 135 1 Methenylamidothiophenol The heterocyclic compound

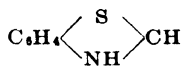


A colorless liquid b 234 **bis-** Bisbenzothiazole **dihydro-** Benzothiazoline **iso-, iso-pseudo-** Benzisothiazole **phenyl-** Ben-

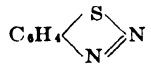
zenylamidothiophenol **pseudo-** Benzopseudothiazole The heterocyclic compound



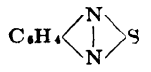
benzothiazoline C_7H_7NS = 137 1 1,2-dihydrobenzothiazole The heterocyclic compound



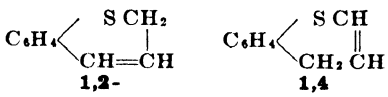
benzothiodiazole $C_6H_4N_2S$ = 136 1 Isopiazthiole, diazosulfide, phenylenediazosulfide, i-piazothiole The heterocyclic compound



iso- Benzisothiodiazole, piazthiole The heterocyclic compound

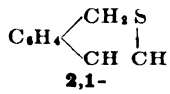


benzothiofuran Thionaphthene
benzothiophene Thionaphthene
benzothiopyran C_9H_8S = 148 1 A group of heterocyclic compounds, *e g* ,



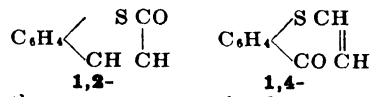
1,2- **1,4**

(Thiochromene)



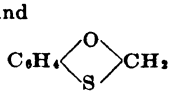
2,1-

dihydro- Thiochroman **2-keto-** Thiocoumarin **4-keto-** Thiochromone
benzothiopyrone C_9H_6OS = 162 1 Thiochromone A group of heterocyclic compounds, as,

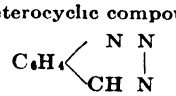


1,2- **1,4-**
thiocoumarin, thiochromone,
q v q v

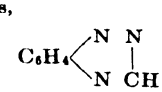
hydroxy- Thiochromonol **phenyl-** Thioflavol
benzothioxole C_7H_6OS = 138 11 The heterocyclic compound



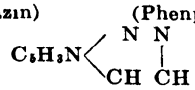
benzotoluide $C_{14}H_{13}ON$ = 211 3 Methylbenzanilide, *N*-benzoyltoluidine The compound PhCONH C_6H_4Me **o-** Rhombic needles, d 1 205, m 146 **m-** Monoclinic prisms d 1 170, m 125 **p-** Rhombic needles, d 1 202, m 158, b 232, insoluble in water, soluble in alcohol
benzotriazine $C_7H_5N_3$ = 131 2 A group of heterocyclic compounds, as,



1,2,3-
(Phentriazin)

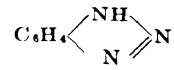


1,2,4-
(Phenpyrrodiazole)

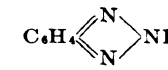


1,2,6-

benzotriazole $C_6H_5N_3$ = 119 2 A group of heterocyclic compounds, as

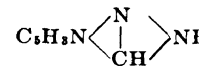


1,2,3-
benzisotriazole



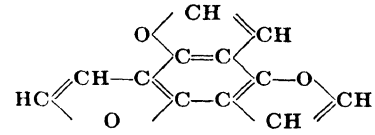
2,1,3-
ψ-azimidobenzene

(azimidobenzene, q v)

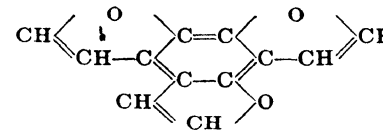


2,1,5-

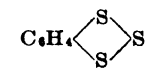
1 2 3- Colorless crystals, m 99, d 1 2, soluble in alcohol or benzene
benzotrichloride $C_7H_5Cl_3$ = 195 4 Toluene trichloride, α-trichloro toluene, phenyl-chloroform benzoic trichloride, benzenyl chloride, $PhCCl_3$ A colorless or yellowish liquid of penetrating odor, d 1 38, m −21, b 214, decomp in water, used in the synthesis of aniline dyes
benzotrifuran $C_{12}H_6O_3$ = 198 04 **1 3 5-** The heterocyclic compound



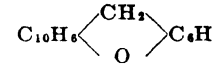
1 2 4- The heterocyclic compound



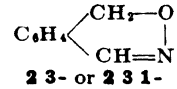
benzotrisulfole $C_6H_4S_3$ = 172 4 The heterocyclic compound



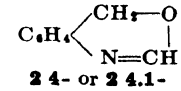
benzoxanthene $C_{17}H_{12}O$ = 232 1 Naphthoxanthene, phenonaphthoxanthene The heterocyclic compound,



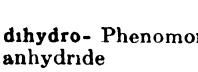
Cf *naphthoxanthine*
benzoxazine C_8H_7ON = 133 1 A group of heterocyclic compounds



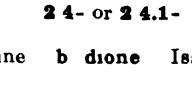
1 3- or 1 3 2-



1 4- or 1 4 2-



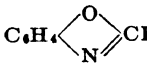
2 3- or 2 3 1-



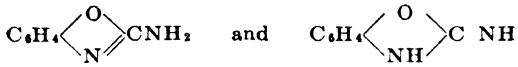
2 4- or 2 4.1-

dihydro- Phenomorpholine **b dione** Isatoic anhydride

benzoxazole C_7H_5ON = 119 09 Methenyl-amidophenol

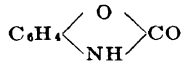


Colorless crystals, m 32, b 183 Cf *benzisoxazole* **amino-** $C_7H_6ON_2$ = 134 1 Colorless crystals, m 130 It occurs in two isomeric forms



anilido- $C_7H_4ON\,NHPh$ = 210 13 Colorless crystals, m 137 **methyl-** Ethenylamidophenol **phenyl-** $C_7H_4ON\,Ph$ = 195 1 Colorless crystals, m 103 **thio-** Thiobenzoxazole

benzoxazolon(e) $C_7H_5O_2N$ = 135 05 The heterocyclic compound,



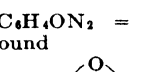
N-ethyl- $C_7H_4EtO_2N$ = 163 07 Colorless crystals, m 29

benzoxazolyl The monovalent radical, C_7H_4ON—, derived from benzoxazole

benzoxdiazine $C_7H_6ON_2$ = 134 07 A group of heterocyclic compounds, similar to benzodiazine, but which contain one oxygen and two nitrogen atoms in the ring, as

1 2 3- Oxygen at position 1, nitrogen at 2 and 3
2 3 4- Oxygen at position 2, nitrogen at 3 and 4
3 1 2- Oxygen at position 3, nitrogen at 1 and 2

benzoxdiazole $C_6H_4ON_2$ = 120 05 The heterocyclic compound

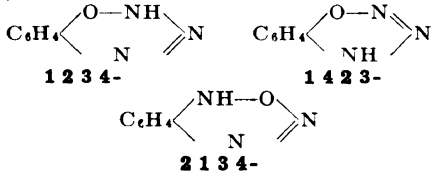


Cf *naphthoxdiazole*

benzoxtetrazine $C_5H_4ON_4$ = 136 07 A group of heterocyclic compounds, similar to benzodiazine, but which contain one oxygen and four nitrogen atoms in the ring, as,

1 2 3 4 6- Oxygen at 1, NH at 2, N at 3 4 and 6
1 4 3 2 6- Oxygen at 1, NH at 4, N at 3 2 and 6
2 1 3 2 7- Oxygen at 2, NH at 1, N at 3 2 and 7

benzoxtriazine $C_6H_5ON_3$ = 135 07 A group of heterocyclic compounds containing one oxygen and three nitrogen atoms in the ring, as,

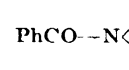


1 2 3 4- **1 4 2 3-**

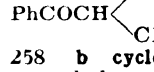
2 1 3 4-

benzoxy The monovalent radical, C_6H_5COO— or PhCOO—, derived from benzoic acid

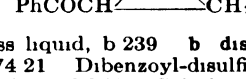
benzoyl The monovalent aryl radical, C_6H_5CO— or PhCO— or Bz, derived from benzoic acid Cf *chlorobenzoyl, nitrobenzoyl* **b acetaldehyde** $C_9H_8O_2$ = 148 11, $PhCOCH_2CHO$ Colorless crystals **b acetate** $C_9H_8O_3$ = 164 06 Acetylbenzoate, acetobenzoic acid anhydride, PhCO O OCMe **b acetic acid** $C_9H_8O_3$ = 164 11 Phenylketoacetic acid, $Ph\text{-}CO\,CH_2\,COOH$ Colorless needles m 61 decomp 103, slightly soluble in water, soluble in alcohol or ether Used in organic synthesis **b acetic ethyl ester** $Ph\,CO\,CH_2\,COOEt$ = 192 10 An oily liquid, b 148 **b acetone** $C_{10}H_{10}O_2$ = 162 13 Acetylacetophenone A homolog of benzoylacetaldehyde, $Ph\,CO\,CH_2\text{-}CO\,Me$ Colorless liquid, d 1 570, m 80, b 260, very slightly soluble in water, soluble in alcohol or ether Used in organic synthesis **b acetonitrile** C_9H_7ON = 145 1 Cyanacetophenone, $Ph\,CO\,CH_2\,CN$ Colorless crystals, m 80, soluble in alcohol or ether **b acetyl** $C_9H_8O_2$ = 148 1 The diketone, $Ph\,CO\,CO\text{-}Me$ A colorless oily liquid, b 214 **b amide** Benzamide **b aniline** Benzanilide **b anthraquinone** $C_{21}H_{12}O_3$ = 312 20, $C_6H_4(CO)_2\text{-}C_6H_3COPh$ White crystals, m 182, insoluble in water, soluble in alcohol or ether **b azide** $C_7H_5ON_3$ = 147 2 Azimide, benzazide, benzoylnitride



Colorless crystals m 20, or a liquid **b benzoic acid** $C_{14}H_{10}O_3$ = 226 08 Benzophenone carboxylic acid, $PhCOC_6H_4COOH$ Colorless crystals, *o-* m 127, *m-* m 162 *p-* m 194 **b benzylamine** $C_{14}H_{13}ON$ = 211 11 $Ph\,CO\,NHCH_2\text{-}Ph$ Colorless crystals, m 105 **b bromide** C_7H_5Br = 185 04 α-Bromobenzaldehyde, benzene carbonylbromide*, PhCOBr A colorless liquid, d 1 57, m 0, b 218, decomp in water soluble in ether **b butylcarbinol** $C_{11}H_{14}O_2$ = 178 11 The compound $PhCO(CH_2)_4OH$ Colorless crystals, m 49 **b carbinol** $C_8H_8O_2$ = 136 06 $PhCOCH_2OH$ Colorless crystals, m 83 **b carbinolacetate** $C_{10}H_{10}O_3$ = 178 08 $PhCOCH_2O\,COMe$ Colorless crystals m 49 b 270 **b chloride** C_7H_5OCl = 140 53 α-Chlorobenzaldehyde, benzenecarbonyl chloride*, PhCOCl A colorless liquid, d 1 219, m −1, b 198, decomp with water or alcohol, but soluble in ether or chloroform, used as a reagent for alcohol and lysidine, in organic synthesis and in the manufacture of dyes **b cyanide** C_8H_5ON = 131 12 α-Cyanobenzaldehyde PhCOCN Colorless scales, m 32, b 207, insoluble in water **b cyclobutane** $C_{11}H_{12}O$ = 160 15



A colorless liquid, b 258 **b cyclopropane** $C_{10}H_{10}O$ = 146 13 B trimethylene The ring-compound

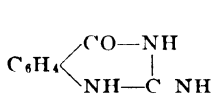


A colorless liquid, b 239 **b disulfide** $C_{14}H_{10}O_4S_2$ = 274 21 Dibenzoyl-disulfide The compound, PhCOSSCOPh Colorless prisms m 128, decomp on further heating, insoluble in water, slightly soluble in alcohol **b ecgonine** Cocaine **b fluoride** C_7H_5OF = 128 08 Benzene carbonyl fluoride*, PhCOF A colorless liquid, b 161 5, insoluble in water **b formaldehyde** $C_8H_6O_2$ = 134 1 (1) *anhydrous* PhCO CHO, phenylglyoxal A colorless liquid, b_{125mm} 142 (2) *hydrated* $PhCO\,CH(OH)_2$ Colorless crystals, m 73 **b formic acid** $C_8H_6O_3$ = 150 1 Phenyl-glyoxylic acid $PhCO\text{-}COOH$ Colorless crystals, m 65, soluble in water, alcohol, or ether **b formoxine** $C_8H_7O_2N$ = 149 1 Isonitrosoacetophenone $Ph\text{-}CO\,CH\,NOH$ Colorless crystals, m 127, used

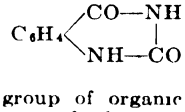
as a reagent for ferrous salts **b glycine.** Hippuric acid **b glycocoll** Hippuric acid **b glycolic acid** $C_9H_8O_4$ = 180 1 PhCO-OCH_2COOH Colorless large prisms, slightly soluble in water, soluble in alcohol or ether **b hydrazine** $C_{14}H_8ON_2$ = 136 1 $PhCONH-NH_2$, α-hydrazinobenzaldehyde Colorless crystals, m 112, b 267, soluble in water, alcohol or ether (2) *di-* Dibenzoyl hydrazine, $(PhCONH)_2$ = 270 3 Colorless crystals, m 233 **b hydride** Benzaldehyde **b hydrogen peroxide** $C_7H_6O_3$ = 138 05 $PhCO\,O_2H$ Colorless crystals, m 41, b 97, insoluble in water, soluble in alcohol or ether **b hydroxide** Benzoic acid **b iodide** C_7H_5OI = 231 95 Benzenecarbonyliodide*, α-iodobenzaldehyde PhCOI Colorless leaflets, m 3 (decomp), decomp in water, soluble in alcohol or ether **b methane** Acetophenone **b naphthol** Naphthol benzoate **b oxide** Benzoic anhydride **b peroxide** $C_{14}H_{10}O_4$ = 242 15 Benzoperoxide, luzidol, $(PhCO)_2O_2$ Colorless rhombic crystals, m 103, insoluble in water, soluble in alcohol, ether, or benzene Used as a flour "improver," and as a bleaching agent **b phenylhydrazine** $C_{13}H_{12}ON_2$ = 212 17 $PhCONHNHPh$ Colorless crystals, m 145, soluble in hot water alcohol, ether or chloroform Used as an antiseptic **b propionaldehyde** $C_{10}H_{10}O_2$ = 162 1 $PhCO(CH_2)_2CHO$ A colorless liquid b 245 **b propionic acid** $C_{10}H_{10}O_3$ = 178 1 $PhCO\,(CH_2)_2COOH$ Colorless needles m 116, soluble in hot water or alcohol **b pseudotropeine** Tropacocaine **b pyrocatechol** *Dihydroxy-*benzophenone **b salicin** Populin **b sulfide** $C_{14}H_{10}O_2S$ = 242 1 $PhCO\,S\,COPh$ Colorless crystals, m 48 **b sulfonic imide** Saccharin **b thiourea** $C_8H_6ON_2S$ = 180 14 $PhCONH\,CS\,NH_2$ Small colorless prisms, m 170, soluble in water or alcohol, insoluble in ether **b trimethylene** B cyclopropane **b urea** $C_8H_8O_2N_2$ = 164 12 $PhCONH\,CO\,NH_2$ A crystalline solid m 215

benzoylation The introduction of the PhCO— radical into a molecule

benzoylene The divalent radical —C_6H_4 CO— **b guanidine** $C_8H_7ON_3$ = 161 2 Benzglycocyanidine



b urea $C_8H_6O\,N_2$ = 162 2 Diketotetrahydroquinazoline



benzoyles A group of organic aromatic compounds containing the benzoylene radical, *e g*, benzoylene guanidine

benzpinacone Benzopinacol

benzpyrazole Isoindazole

benzpyrene Benzopyrene

benz-seleno See *benzo-seleno-*

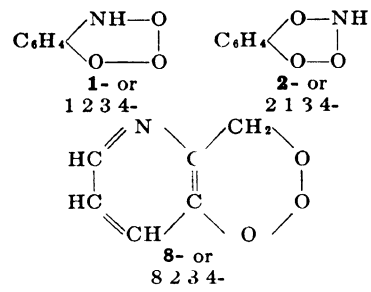
benzsulfhydroxamic acid Benzene sulfonic hydroxamide

benz-sulfo- See *benzosulfo-*

benz-syn-aldoxime Benzaldoxime

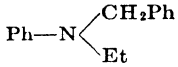
benzthiophen Thionaphthene

benztrioxazine $C_6H_5O_3N$ = 139 1 A group of heterocyclic compounds which contain three oxygen atoms and one nitrogen atom in the ring, as,

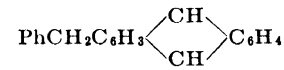


benzyl The monovalent aryl radical, C_7H_7—, $PhCH_2$— or $C_6H_5CH_2$—, derived from toluene **b acetamide** $C_9H_{11}ON$ = 149 01 **N-** $Ph-CH_2NHCOMe$ Colorless crystals m 60 b 300, soluble in ether α- Hydrocinnamamide **b acetate** $C_9H_{10}O_2$ or $MeCOOCH_2Ph$ = 150 13 A colorless liquid, d_{16}°1 057, b 206, very slightly soluble in water, soluble in hot alcohol or ether Cf *methylbenzoate* **b acetoacetic ether** $C_{13}H_{16}O_3$ or $C_2H_3O\,CHCH_2Ph\,COOEt$ = 220 20 A colorless liquid, d_{25}°1 061, b 287, insoluble in water, miscible with alcohol or ether **b acetophenone** Propiophenone **b acrylic acid** $C_{10}H_{10}O_2$ = 162 08 Methylene hydrocinnamic acid, $CH_2\,C(PhCH_2)_2COOH$ Colorless crystals m 69 **b alcohol** C_7H_8O or $PhCH_2OH$ = 108 10 Phenyl carbinol, benzalcohol phenmethylol, α-hydroxytoluene, $PhCH_2OH$ A colorless liquid with an aromatic odor and a sharp burning taste, d 1 045, b 204 7, slightly soluble in water, soluble in alcohol or ether Used as a local anesthetic and in perfumery (**hydroxy-**) $C_6H_4(OH)CH_2OH$ = 124 10 **o-** Saligenin **m-** m-oxybenzyl-alcohol Colorless needles, m 67, decomp 300 soluble in hot water, alcohol or ether **p-** Colorless needles, m 110, soluble in water alcohol or ether (**hydroxy methoxy-**) Vanillic alcohol (**isopropyl-**) Cuminol (**methoxy-**) Anisyl alcohol (**methyl-**) Homosaligenin (**methylamino-ethyl-**) Ephedrine (**methylenedioxy-**) Piperonyl alcohol (**methyl-isopropyl-**) Thymotic alcohol (**nitro-**) $NO_2C_7H_4CH_2OH$ = 153 10 **o-** Colorless needles, m 74, soluble in alcohol, water or ether **m-** White rhombic crystals, m 27 **p-** Colorless needles m 93, b 179, soluble in water, alcohol or ether (**oxy-**) See *hydroxy-b alcohol* **b amine** C_7H_9N or $PhCH_2NH_2$ = 107 15 Phenylmethylamine Colorless liquid d_{20}°0 980 b 184 miscible with water, alcohol or ether Used in organic synthesis (**di-**) $(PhCH_2)\,NH$ = 197 13 Diphenylmethylimine A colorless liquid, b 300, soluble in alcohol (**imino-**) Benzamidine (**tri-**) $(PhCH_2)_3N$ = 287 17 Colorless crystals, m 91 **b aniline** $C_{13}H_{13}N$ = 183 2 The aromatic diamine $PhCH\,NHPh$ Colorless prisms, m 32, b 310, insoluble in water, soluble in alcohol or ether used in organic synthesis (**di-**) $C_{21}H_{19}N$ = 285 3 The aromatic triamine, $(PhCH_2)_2NPh$ Colorless crystals, m 67 **b azide** $C_7H\,N_3$ or $PhCH_2N_3$ = 133 12 A liquid b $_{25mm}$108, insoluble in water **b benzene** Diphenylmethane, $PhCH_2Ph$ **b benzoate** $C_{14}H_{12}O_2$ or $PhCOOCH_2Ph$ = 212 17 A colorless oily liquid with faint aromatic odor and sharp burning taste, d_{19} 1 114, m 18 5, b 321, insoluble

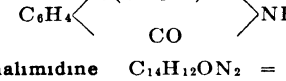
in water or glycerin, soluble in alcohol, ether or chloroform Used medicinally as an antispasmodic **b benzoic acid** Diphenylmethane carboxylic acid **b bichloride** Benzalchloride **b bromide** C_7H_7Br = 171 06 α-bromotoluene, $PhCH_2Br$ A colorless liquid, $d_{22°}$1 438, m -3 9, b 198 5, insoluble in water, miscible with alcohol or ether Used as a poison gas in chemical warfare **b carbamate** $C_8H_9O_2N$ = 151 12 $PhCH_2O\,CO\,NH_2$ A colorless liquid, b 197, insoluble in water, miscible with alcohol or ether **b carbamide** B urea **b carbinol** $C_8H_{10}O$ = 122 10 Phenylethyl alcohol, phenylethanol, α-hydroxy-β-phenyl ether, $PhCH_2CH_2OH$ A colorless liquid, d 1 024, b 212, slightly soluble in water, soluble in alcohol or ether It is a constituent of oil of rose, geranium, etc , used in artificial flower oils (iso-) Phenylmethylcarbinol, $PhCHMeOH$ A colorless liquid, b 203 **b carbonimide** $PhCH_2NC$, isomeric with b cyanide **b chloride** C_7H_7Cl = 126 55 α-Chlorotoluene, $PhCH_2Cl$ A colorless liquid, d 1 103, m −41, b 178, insoluble in water, miscible with alcohol or ether Used in the synthesis of bitter almond oil and aniline dyes **b cinnamate** $C_{16}H_{14}O_2$ = 238 11 Cinnamein The ester $C_8H_7COOCH_2Ph$ Colorless prisms, m 39, used in perfumery **b cyanamide** $C_8H_8N_2$ = 132 12 The compound $PhCH_2NHCN$ A crystalline solid, m 33, insoluble in water, soluble in alcohol or ether **b cyanide** C_8H_7N = 117 15 Phenylacetonitrile, α-toluonitrile, α-cyano-toluene, $PhCH_2CN$ A colorless liquid, d 1 0146, m −24 6, b 233 5, insoluble in water, soluble in alcohol or ether Used in organic synthesis (iso-) B carbonimide (**nitro-**) $NO_2\,C_6H_4\,CH_2CN$ = 162 11 **o-** Colorless needles, m 83, soluble in hot water **p-** Colorless prisms, m 115, insoluble in water, soluble in alcohol or ether **b fumarate** $C_{18}H_{16}O_4$ = 326 14 Dibenzyl fumarate, $(PhCH_2OOC\,CH{=})_2$ A white odorless solid, insoluble in water, used as antispasmodic Cf *b succinate* **b dichloride** Benzalchloride **b diphenyl** $C_{19}H_{16}$ = 244 15 The hydrocarbon $PhCH_2\,C_6H_4Ph$ **o-** Monoclinic needles, m 54, b_{650mm}283, soluble in alcohol or ether **p-** Colorless leaflets, m 85, b 285, soluble in alcohol or ether **b diphenylamine** $C_{19}H_{17}N$ = 259 15 $PhCH_2\,NPh_2$ Colorless crystals, m 87 **b disulfide** $C_{14}H_{14}S_2$ = 246 30 $PhCH_2S\,SCH_2Ph$ Colorless leaflets, m 71, soluble in alcohol, ether or benzene **b ether** $C_{14}H_{14}O$ = 198 19 Benzyloxide, $(PhCH_2)_2O$ A colorless oily liquid, d 1 036, b 297, miscible with alcohol or ether **b ethylaniline** $C_{15}H_{14}N$ = 208 2 The tertiary amine



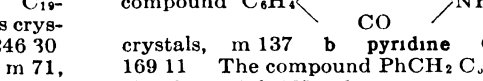
A yellowish liquid b 286°C (decomp), insoluble in water, miscible with alcohol, ether, or chloroform **b ethylbenzene** $C_{15}H_{16}$ = 196 20 The hydrocarbon $PhCH\,C_6H_4\,Et$ A colorless liquid, d 0 985, b 194, soluble in ether, alcohol or chloroform **b formamide** C_8H_9ON = 135 1 $PhCH_2\,NH\,CHO$ (**o-nitro-**) $NO_2\,C_6H_4\,CH_2$ - $NHCHO$ = 181 10 Colorless crystals, m 89 **b hydrazine** $C_7H_{10}N_2$ = 122 2 $PhCH_2$-$NHNH_2$ A colorless liquid, b_{33mm}135 (**di-**) $C_{14}H_{14}N_2$ = 212 3 The compound $PhCH_2$-$NHNHCH_2Ph$ Colorless crystals, m 65, used in organic synthesis **b hydroxylamine** C_7H_9ON = 123 09 α- $PhCH_2ONH_2$ A colorless liquid, b 123 β- The compound $PhCH_2$-$NHOH$ Colorless crystals, m 57 (**di-**) The compound $PhCH_2NHOCH_2Ph$ = 213 14 (**tri-**) The compound $(PhCH_2)_2NOCH_2Ph$ = 303 19 **b idene** Benzylidene **b iodide** C_7H_7I = 218 08 α-Iodotoluene, or $PhCH_2I$ A colorless liquid, d 1 734, m 24, decomp on further heating, soluble in alcohol, ether, or carbon disulfide Used in organic synthesis and in the manufacture of drugs and dyes **b isocyanide** B carbimide **b isosulfocyanide** B sulfocyanide **b isothiocyanate** B mustard oil **b ketone** $C_{15}H_{14}O$ = 210 19 The ketone $(PhCH_2)_2CO$ White crystals, m 34, b 330, insoluble in water, soluble in alcohol or ether **b mercaptan** C_7H_8S = 124 16 B sulfhydrate, b thiol, $PhCH_2SH$ A colorless liquid, d 1 058, b 196 **b morphine** Peronine **b mustard oil** C_8H_7SN = 149 19 Benzylisothiocyanate, $PhCH_2NCS$ A colorless liquid, b 243, insoluble in water, miscible with alcohol or ether **b naphthalene** $C_{17}H_{14}$ = 218 20 The hydrocarbon $C_{10}H_7CH_2Ph$ α- Monoclinic prisms, m 58 6, b 350 β- Monoclinic prisms m - 35, b 345 **b naphthylketone** $C_{18}H_{14}O$ = 246 11 $PhCH_2COC_{10}H_7$ Colorless scales, m - 57, soluble in alcohol or ether **b nitrile** B cyanide **b oxethylamine** $C_9H_{13}ON$ = 151 2 Picrate Colorless crystals, m 136 **b phenanthracene** $C_{21}H_{16}$ = 268 13 The hydrocarbon



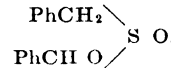
Colorless needles m 155, insoluble in water, soluble in alcohol or ether **b phenol** $C_{13}H_{12}O$ = 184 1 $PhCH_2C_6H_4OH$ **p-** Colorless crystals, m 84, b 325, soluble in water or alcohol **b phenylamine** B aniline **b phthalazone** $C_{15}H_{12}ON_2$ = 236 2 The compound



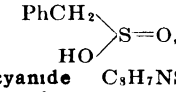
b phthalimidine $C_{14}H_{12}ON_2$ = 224 1 The compound



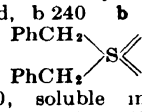
Colorless crystals, m 137 **b pyridine** $C_{12}H_{11}N$ = 169 11 The compound $PhCH_2\,C_5H_4N$ α- b - 276, β- m 34, b 287 **b succinate** $C_{18}H_{18}O_4$ = 328 14 Dibenzylsuccinate, $(PhCH_2OOC$-$CH_2{-})_2$ White odorless powder, insoluble in water, soluble in alcohol, used as antispasmodic Cf *b fumarate* **b sulfhydrate** B mercaptan **b sulfide** $C_{14}H_{14}S$ = 214 22 B thioether, $(PhCH_2)_2S$ Colorless scales, d 1 071, m 49, b_{13mm}180, insoluble in water, soluble in alcohol or ether Used in organic synthesis **b sulfine** $C_{14}H_{14}O_2S$ = 246 24

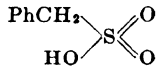


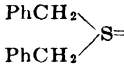
an isomer of b sulfone **b sulfinic acid** $C_7H_8O_2$ = 124 12

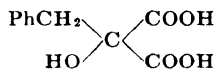


, or $PhCH_2$-$SO\,OH$ **b sulfocyanide** C_8H_7NS = 149 19 B rhodanide, b thiocyanate, $PhCH_2CNS$ Colorless prisms, m 41, b 230, insoluble in

water, soluble in alcohol or ether (iso-) B isorhodanide, b isothiocyanate $PhCH_2NCS$ Colorless liquid, b 240 **b sulfone** $C_{14}H_{14}O_2S$ = 246 24  Colorless, flat, needles, m 150, soluble in alcohol, ether, acetone or benzene **b sulfonic acid** $C_7H_8O_3S$ = 172 1



or $PhCH_2SO_2OH$ **b sulfoxide** $C_{14}H_{14}OS$ = 230 21  Colorless leaflets, m 132, soluble in hot water, alcohol, or ether **b tartronic acid** $C_{10}H_{10}O_5$ = 210 1

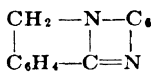


Colorless crystals, m 143 decomp on further heating, soluble in water, alcohol or ether **b thiourea** $C_8H_{10}N_2S$ = 166 2 B sulfocarbamide $PhCH_2NH\ CS\ NH_2$ Colorless crystals, m 162, soluble in water **b thiocyanate** B sulfocyamide **b urea** $C_8H_{10}ON_2$ = 150 20 B carbamide, $PhCH_2NH\ CO\ NH_2$ Colorless needles, m 147 (decomp), slightly soluble in water, soluble in alcohol or ether

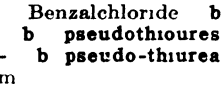
benzylation The introduction of the benzyl radical into an organic molecule, or conversion into benzyl derivatives

benzylcarbamide See *benzyl*

benzylene The divalent radical, $—C_6H_4CH_2—$, which usually occurs in bicyclic compounds **b benzimidazole** The tetraheterocyclic system



b chloride Benzalchloride **b glycol** Hydrobenzoin **b pseudothioures** Coumothiazone, imido- **b pseudo-thiurea** The heterocyclic system



b ψ-thiourea Coumothiazone, imido- **b thiurea** B pseudo-thiurea

benzylidene The divalent $PhCH=$ or $C_7H_6=$ radical, in which the two valencies are usually attached to one atom of another radical, thus forming a double bond Cf *benzal*

b acetone $C_{10}H_{10}O$ = 146 1 Benzalacetone, methylcinnamyl ketone, acetocinnamone, methyl styryl ketone $PhCH\ CHCOMe$ Colorless crystals with odor like coumarin, m 42, soluble in alcohol or ether Used in organic synthesis *di-* Styryl ketone **b bromide** $C_7H_6Br_2$ or $PhCHBr_2$ = 249 94 A liquid, b_{20mm}130 **b chloride** Benzalchloride

benzylmorphine Peronine

benzylphenylamine Benzyl aniline

beraunite A native iron phosphate

Berberidaceae The barberry family A group of herbs, shrubs or trees with a watery juice Several of them yield drugs

Caulophyllum thalictroides	blue cohosh
Podophyllum peltatum	may apple, podophyllin
Berberis vulgaris	barberry
Jeffersonia diphylla	twin leaf
Nandina domestica	nandinine, domesticine

berberine $C_{20}H_{17}O_4N\ 6H_2O$ = 443 34 An alkaloid from the roots of *Hydrastis canadensis* (golden seal), *Berberis vulgaris*, and other Ranunculaceae Orange or yellowish crystals m 145, soluble in water or alcohol, slightly soluble in ether Used as hydrochloride or sulfate Cf *bebeerine* **b bisulfate** Is b sulfate **b carbonate** $C_{20}H_{17}N\ H_2CO_3\ 2H_2O$ = 395 15 Yellow crystals, soluble in hot water or alcohol **b hydrochloride** $C_{20}H_{17}O_4N\text{-}HCl\ 2H_2O$ = 407 61 Yellow crystals or amorphous powder, d 1 397, soluble in water or alcohol It is a general tonic, stomachic and gentle laxative **b sulfate** $C_{20}H_{17}O_4N\ H_2SO_4$ = 433 32 Orange-yellow needles, soluble in water or alcohol It is an antiperiodic, stomachic, and tonic

berberis The dried stems of *Berberis aristata* or *vulgaris*, used as a fluid-extract as a tonic and purgative See *barberry*

berberonic acid $C_8H_8O_6N\ 2H_2O$ = 250 1 2-4 5-pyridine tricarboxylic acid*, $C_5H_5N(CO\text{-}OH)_3$ Colorless, triclinic crystals, decomp 235, slightly soluble in water or alcohol, soluble in ether

berengelite A Peruvian, pitchlike mineral used for caulking

beresovite A native mixed chromate and carbonate of lead

bergamot oil A yellowish green, volatile essential oil from the rind of *Citrus bergamia*, a Rutaceae, d 0 880–0 885, insoluble in water, soluble in alcohol, ether, chloroform or benzene It contains linalyl acetate limonene and linalol, used in perfumery, and as a histological clearing agent

bergblau A native copper carbonate

bergenine $C_6H_3O_3\ H_2O$ = 141 1 A bitter principle from *Saxifraga crassifolia*, m 140, soluble in water or alcohol

bergenose An ilmenite-norite from Norway

bergnization See Bergius process (1)

Bergius, Friedrich A German chemist noted for his industrial processes **B process** (1) Bergnization The production of motor fuels by the hydrogenation and liquefaction of coal, which is pulverized and subjected at 400–450°C to an atmosphere of hydrogen under a pressure of 120–200 atmospheres, which transforms it into a black tarry liquid This yields 50 % crude oil and other products (bergin products) (2) A method of manufacturing sugar from wood by treating sawdust with 40 % HCl and removing the acid by vapors from hot mineral oil

Bergman, Torbern Olof 1735–1784 A Swedish chemist and pioneer in devising symbols for chemical elements In his *Opuscula physica et chemica* (1783) he adapted the alchemical symbols consisting of circles and arcs, and represented compounds by joining them together He also devised analytical methods, and developed chemical industry

beriberi A disease due to a deficiency of vitamin B

Berkefeld filter A porous porcelain cylinder for the filtration of toxins and sera or the preparation of sterile solutions

berkevilite Barkevite

Berkshire sand A purified sea-sand used for filtration, and in the Sedgwick rafter funnel, which is used in water analysis

Berlin blue Ferric-ferrocyanide

bernstein Amber **b säure** Succinic acid

Berthelot, Marcellin Pierre Eugène 1827–1907 A French statesman, chemist and pioneer in physical chemistry "All chemical reactions are dependent upon physical forces" He also worked on the history of chemistry Cf *Berthollet*

berthierine An iron ore from Alsace, consisting of magnetite and chamosite

berthierite $FeSb_2S_4$ A native iron sulfantimonide, which occurs in dark-gray metallic prisms

Berthollet, Count Claude Louis 1748–1822 A French chemist and contemporary of Lavoisier He discovered the compositions of ammonia and hydrogen sulfide and developed industrial chemistry, *e g*, dyeing Cf *Berthelot*

berthollide Proposed name for an alloy Cf *daltonide*

bertrandite $H_2Be_4Si_2O_9$ A native beryllium silicate which occurs in colorless, transparent, orthorhombic crystals

beryl $Al_2Be_2Si_6O_{18}$ A native beryllium, aluminum silicate, found as hexagonal, colorless, green, blue or brownish crystals MW 539 9, d 2 7, MV 200, hardness, 7 5–8 The transparent varieties are used as gems, *e g*, *aquamarine*, *smaragd*, *rosterite*, *emerald*

beryllia Beryllium oxide

beryllium Be = 9 02, or glucinum Gl An element of the magnesium group, atomic number 4 A hard, non-corrodible, grayish-black metal in hexagonal crystals, $d_{20°}$ 1 85, m 1285, soluble in acids or alkalis Beryllium ores are generally found in granite rocks, *e g*, beryl, chrysoberyl, euclase, helvite, and phenacite Beryllium is divalent and forms only one series of compounds It was discovered in 1797 by Vauquelin in beryl, and isolated in 1828 by Bussy and Woehler The metal and its compounds are at present of little industrial importance, but it may become valuable for aircraft as it imparts strength and hardness to aluminum alloys, with silver it forms untarnishable alloys It is also used for windows in x-ray tubes **b acetate** $(CH_3COO)_2Be$ = 127 07 Colorless plates, decomp 285 *basic-* $BeO\ 3Be(C_2H_3O_2)_2$ = 406 22 White octahedric crystals, d 1 364, m 284, b 331, decomp in water **b acetylacetonate** $Be(C_5H_7O_2)_2$ = 207 13 Monoclinic crystals, d 1 168, m 108, b 270, slightly soluble in water **b alkyls** The organic compounds of beryllium, containing aliphatic radicals, *e g b ethide* **b bromide** $BeBr_2$ = 168 94 White, hygroscopic needles, m 601, soluble in water **b carbide** Be_2C = 30 21 Yellow, hexagonal crystals, $d_{15°}$ 1 9, decomp by water **b carbonate** $BeCO_3\ 4H_2O$ = 141 2 Glucinum carbonate A white powder, insoluble in water, decomp by acids It occurs also in basic salts of variable composition **(basic-)** $(BeO)_5CO_2\ 5H_2O$ = 259 59 A white powder, insoluble in water, decomp by acids, soluble in alkalis **b chloride** $BeCl_2$ = 80 9 Glucinum chloride White deliquescent needles, m 400, b 500, soluble in water, alkalis or acids **(liquid)** $BeCl_2\ 4H_2O$ A slightly yellowish, sirupy liquid, miscible with water or alcohol **b ethide, b ethyl** $BeEt_2$ = 67 20 Glucinum ethide A colorless liquid, b 185–188 **b fluoride** BeF_2 = 47 1 A white powder, $d_{15°}$ 2 1, m 800, soluble in water, alcohol or acids **b hydroxide** $Be(OH)_2$ = 43 1 Glucinum hydroxide A white powder, decomp on heating, insoluble in water, soluble in alkalis, carbonates or alcohol **b iodide** BeI_2 = 262 92 White needles, $d_{15°}$ 4 20, m 510, b 590, decomp by water, soluble in alcohol, ether or chloroform **b nitrate** $Be(NO_3)_2\ 3H_2O$ = 187 2 Glucinum nitrate Colorless or slightly yellow deliquescent crystals, soluble in water or alcohol, used as a reagent, also as a hardener in gas mantles **b oxalate** $Be(C_2O_4)\ 3H_2O$ = 151 07 Rhombic crystals, d 1 478, m -(−2H_2O)100, (−H_2O)220 **b oxide** BeO = 25 1 Beryllia, glucinum oxide An amorphous white powder, $d_{0°}$ 3 016, infusible, insoluble in water, soluble in alkalis or acids Used in the manufacture of beryllium salts, and as a refractory **b oxychloride** Be_2OCl_2 = 105 12 Glucinum oxychloride White hexagonal crystals, $d_{0°}$ 3 016, infusible, insoluble in water, soluble in acids or alkalis **b phosphate** Beryllonite **b potassium fluoride** $BeF_2\ 2KF$ = 163 30 Glucinum potassium fluoride White crystals, slightly soluble in water **b silicate** Be_2SiO_4 A white powder used as refractory, for sparking plug porcelain and in making Be compounds Cf *beryl* **b sodium fluoride** $BeF_2\ 2NaF$ = 131 10 Glucinum sodium fluoride A white or grayish crystalline powder, soluble in water, used in preparing metallic beryllium **b sulfate** (1) $BeSO_4\ 4H_2O$ = 177 2 Glucinum sulfate White tetragonal crystals, $d_{10°}$ 1 712 It loses two molecules of water on heating to 100, decomp on further heating Soluble in water insoluble in alcohol (2) $BeSO_4\ 7H_2O$ = 231 28 White monoclinic crystals

beryllonite A native phosphate of beryllium, $NaBePO_4$ Yellowish transparent crystals, d 2 845, hardness, 5 5-6

berzelianite Cu_2Se A native copper selenide, which occurs in thin white crusts Cf *crookesite*, *umangite*

berzeliite $(Mg, Ca, Mn)_3As_2O_8$ A native arsenate of magnesium, calcium and manganese, which occurs in red waxy masses

berzelium A supposed element of atomic weight 212, found by Baskerville in thorium salts

Berzelius, Jöns Jakob, Baron 1779–1848 A Swedish chemist, the investigator of atomic weights, using oxygen as standard, and a prolific author He also worked on electrochemical analysis, isomerism, and the gas laws He discovered selenium and thorium, and isolated silicon

Bessemer, Sir Henry 1813–1898 An English metallurgist who patented the process of making steel in 1856 **b converter** A large egg-shaped retort used in steel and iron manufacture **b iron** An iron manufactured by the Bessemer process **b process** A method of making steel by pouring the molten cast iron in a specially designed container (converter), and passing a stream of air through

the molten mass to oxidize metals such as manganese, silicon and carbon.

Bestuscheff's tincture. An ethereal tincture of iron chloride.

beta. The second letter of the Greek alphabet, β. Compare *alpha*. **b. acid.** Same as 2.6-naphthylamine sulfonic acid. **b. chlora process.** A method of bleaching flour with nitrosyl chloride and chlorine. **b. eucaine.** Betaeucaine. **b. hydrogen.** See *hydrogen molecule*. **b. position.** The substitution of the 2nd., 3rd., 6th., or 7th. hydrogen atom of a dicyclic com-

Jöns Jakob Berzelius.

pound, or of the hydrogen atom attached to the carbon atom next but one to the principal group of a straight chain compound; *e.g.*, β-hydroxy propionic acid, $CH_2OH.CH_2.COOH$. Cf. *alpha* position. **b. particles.** A stream of negatively charged particles (electrons) emitted from radioactive substances with the velocity of light (87,000 miles per second). **b. ray.** See *b. particles*.

Beta. A genus of plants, Chenopodiaceae, the beets. The juice of *B. vulgaris* yields sugar (q.v.); also betaine and an indicator.

betacaine. Betaeucaine.

betaeucaine. $C_{15}H_{21}NO_2$ = 247.2. Trimethyl-benzoyl-oxypiperidine. Benzoylvinyl-diacetonalkylamine. A synthetic drug used as its hydrochloride as a local anesthetic. **b. hydrochloride.** $C_{15}H_{21}O_2N.HCl$ = 283.65. A white odorless powder; soluble in water, alcohol, or chloroform. Used as a local anesthetic.

betaimidazolethylamine. Histamine.

betaimine-azolyl-ethylamine. Ergamine.

betaine. $C_5H_{11}O_2N(+H_2O)$ = 117.11. The compound $MeN\langle\begin{matrix}CO\\CH_2\end{matrix}\rangle O$. Lycine, oxyneurine, dimethylsarcosine, trimethylglycocoll. An alkaloid, prepared from beets or synthetically. Colorless monoclinic crystals, m.293 (decomp.); soluble in water or alcohol. **nicotine methyl-Trigonelline. pyridine-** The heterocyclic compound, $HC\langle\begin{matrix}CH{=}CH\\CH{-}CH\end{matrix}\rangle N\langle\begin{matrix}CO\\CH_2\end{matrix}\rangle O$. **thio-**Thetine. **trimethyloxybutyn-** Carnitine. **trimethylphosphor-** The heterocyclic compound,

$$Me_3P\langle\begin{matrix}CO\\CH_2\end{matrix}\rangle O.$$

b. hydrochloride $C_{15}H_{11}O_2N.HCl$ = 153.57. Acidol. Colorless crystals, m.235; soluble in water. Used for administration of HCl, and the neutralization of tetanus toxin.

betaines. A group of organic bases characterized by the $=NMe_3$ group.

glycine betaine....	$Me_3N.CH_2.CO$ (O)
γ-butyro betaine..	$Me_3N.(CH_2)_3.CO$ (O)
carnitine.....	$Me_3N.CH_2.CHOH.CH_2.CO$ (O)
croton betaine....	$Me_3N.CH_2.CH{:}CH.CO$ (O)

Cf. *stachydrine, trigonelline*.

betaisoamylene. Amylene.

betamethyl-ethylpyridine. Collidine.

betamethyl-indole. Skatole.

betanaphthol. See *naphthol*. **b. benzoate.** See *β-naphthol benzoate*. **b. orange.** Tropaeolin. **b. salicylate.** Betol.

betanaphthyl. Naphthyl. **b. amine.** β-Naphthylamine. **b. benzoate.** β-Naphtholbenzoate. **b. salicylate.** Betol.

beta-oxybutyric acid. β-Oxybutyric acid.

betaquinine. Quinidine.

betaterpineol. β-Terpineol.

betatopic. Pertaining to a radio-active substance which differs from one of its isotopes by one orbital electron and one integer in atomic number (cf. *alphatopic*). **b. change.** The transformation of a radioactive substance, in which it loses an orbital electron, and thereby becomes an isotope of an element with an atomic number higher by 1.

betaxin. Vitamin B_1.

betel. (1) Originally the betel vine. Cf. *betel leaf*. (2) An East Indian chewing substance, which consists of a fragment of betel-nut rolled up in a betel leaf, with some lime, gambir or other substance. It is a tonic and stimulant. (3) Pinang. The Areca or catechu palm of the East Indies. **b.-leaf.** The dried leaves of *Piper Betle*, a Piperaceae. **b.-nut.** Areca nut, buyo, semen arecae. The dried seed of *Areca catechu*, an East Indian palm. It contains many alkaloids; *e.g.*, arecoline, arecaine, guvacine. Used as an astringent, anthelminthic, tonic, and stimulant. See also *areca* nut. **b. phenol.** Chavibetol.

beth root. Trillium.

betol. $C_{17}H_{12}O_3$ = 264.2. Salinaphthol, naphthalol, betanaphthyl-salicylate. Salicylic-β-naphthyl ether. $C_{10}H_7COO.C_6H_4OH$. A white amorphous powder; insoluble in water, soluble in alcohol, m.95. It is an intestinal antiseptic, antirheumatic, and antizymotic. Cf. *alphol*.

Bettendorf test. The official U.S.P. test for arsenic in the presence of bismuth and antimony compounds. A freshly prepared $SnCl_2$ solution is added to the sample: A brownish tint indicates arsenic.

Betts' process A method of refining lead by using the fluosilicate with a little gelatin as an electrolyte

betula A genus of trees of the oak family, Cupuliferae See *birch* **b camphor** Betulinol **b oil** See *birch oil*

betulin Betulinol **b amaric acid** $C_{36}H_{52}O_{16}$ = 740 5 An oxidation product of betulinol

betulinic acid $C_{30}H_{54}O_6$ = 582 6 A dibasic acid, m 195, formed by oxidation of betulin

betulinol $C_{24}H_{40}O_2$ = 360 4 Betula camphor, betulin A diatomic alcohol from the bark of betula species (*e g*, white birch) Colorless crystals, m 258, insoluble in water

beudantite Biereite, corkite A native sulfate and phosphate of iron and lead which occurs in dark green or black rhombohedrons

Beutel buret float A hydrometer-like closed glass tube, used in burets to facilitate the readings

beyrichite Ni_3S_4 A native nickel sulfide, which occurs in metallic, grayish hexagonal crystals

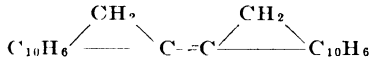
bhang An intoxicating preparation made from the flowering tops of hemp Cf *hashish*

Bi The symbol for bismuth **BiO-** Bismuthyl

bi- (1) Prefix indicating two or double Cf *di-* and *bis-* (2) Misnomer for acid salt as bisulfate

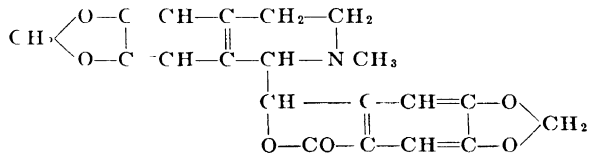
biacenaphthylidene Biacene

biacene $C_{24}H_{16}$ = 304 2 $\Delta^{7,7'}$ biacenaphthylidene The hydrocarbon



Reddish-yellow crystals, m 271, which show distinct dichroism when dissolved in conc H_2SO_4, indigo-blue in transmitted light, red in incident light

biacetyl $C_4H_6O_2$ = 86 05 *2 3*-butane-dione*, diacetyl The simplest diketone MeCO COMe A colorless liquid of pungent, sweet odor,



d 0 9793 b 88 slightly soluble in water, soluble in alcohol or ether **b dioxime** Dimethylglyoxime **b monoxime** MeCO C(NOH)Me

biacetylene C_4H_2 = 50 0 Butadiine, butadiyne*, HC≡C—C≡CH

Bial's reagent A solution of 1 gm orcin in 500 cc 30 % HCl and 25 drops of $FeCl_3$ solution, used for the detection of pentoses in urine, in absence of dextrose

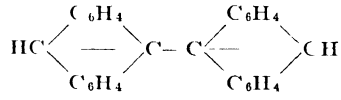
biallyl Diallyl

bianiline N- Hydrazobenzene **p-** Benzidine

bianisaldehyde Anisil

bianisidine Dianisidine

bianthryl $C_{28}H_{18}$ = 354 29 The hydrocarbon



Colorless leaflets, m 300

biarsine As_2H_4 = 153 94 Diarsine, diarsyl The compound $H_2As—AsH_2$ Cf *arsines*

tetraethyl- As_2Et_4 = 266 03 Ethylcacodyl A colorless liquid, igniting in air, d 1 1388, b 187, insoluble in water **tetramethyl-** Cacodyl

biaxial Having two axes **b crystals** A crystal with two optical axes

bibasic Dibasic, having two hydrogen atoms which can be replaced by metals

bibenzal Stilbene

bibenzenone Diphenoquinone

bibenzenyl Tolane

bibenzil (1) Dibenzil, (2) Dibenzyl

bibenzohydrol Benzopinacol

bibenzoic acid Diphenic acid

bibenzoyl (1) Benzil (2) Dibenzoyl a prefix indicating the presence of two benzoyl radicals

bibenzyl $C_{14}H_{14}$ = 182 19 Dibenzyl **asymmetric-** Me CHPh$_2$ A colorless liquid b 209 **symmetric-** Diphenylethane, $PhCH_2 CH_2Ph$ Colorless, monoclinic needles, m 52 b 284, slightly soluble in alcohol soluble in ether or chloroform **b alcohol** Hydrobenzoin

biberine Bebeerine

biborate An acid borate, as $NaHBO_3$ Cf *diborate*

bibulous Absorbing moisture **b paper** Blotting or filter paper

bicarbonate Dicarbonate acid carbonate A salt containing the monovalent HCO_3 radical **b of potash** Potassium b **b of soda** Sodium b

bicarburetted hydrogen An obsolete name for ethylene

bichloride A salt containing two atoms of chlorine, *e g* mercury bichloride

bichromate Dichromate, acid chromate A salt containing the divalent $=Cr_2O_7$ radical, as, sodium b , $Na_2Cr_2O_7$ **b cell** See *cell*

bichrome Potassium dichromate

biconcave See concave *lens*

biconvex See convex *lens*

bicuculline $C_{22}H_{21}O_6N$ = 367 15 An alkaloid from *Dicentra cucullaria*, *Corydalis sempervirens* and *Adlumia fungosa*, (Fumaraceae) Dimorphic crystals m 177 and 196

Adlumine has two $CH_3O—$ groups instead of the

bicyclic Containing two rings, as, naphthalene

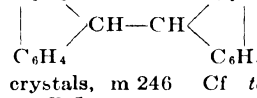
bicyclodecane Dekalin

bicycloheptane 1 1 3- Norpinane **1 2 2-** Norcamphane **0 1 4-** Carane **2 4-** Pinane

bicycloheptene 0 1 4- Carene **1 1 4-** Norcarene **1 1 3-** Pinene

bidesyl $C_{28}H_{22}O_2$ = 390 2 Dibenzoyldibenzyl PhCO CHPh CHPh COPh Colorless crystals, m 255

bidiphenyleneethane $C_{26}H_{18}$ = 330 2 The hydrocarbon



Colorless crystals, m 246 Cf *tetraphenylene* **b ethylene** Bifluorene

bieberite $CoSO_4 7H_2O$ A native cobaltous sulfate, red monoclinic crystals

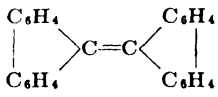
Biebrich red Scarlet R

biethylene *1 3*-Butadiene*

Biffi-Brooks coagulometer A device for determining the temperature of coagulation of proteins

biguanide Guanylguanidine

bifluorene $C_{26}H_{16}$ = 328 2 Bidiphenylene ethylene The hydrocarbon



Red needles, m 188

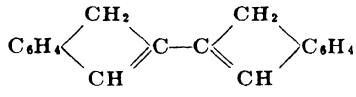
biformyl Glyoxal

bihexyl Dodecane*

bihydrazine N_4H_6 = 62 2 Buzane, dihydrobuzylene, tetrazane, $NH_2\,NH\,NH\,NH_2$ Cf *tetrazanes*

biindoxyl Indigo white

biindyl $C_{18}H_{14}$ = 230 1 The hydrocarbon

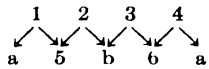


Cf *diindyl*

bikhaconitine $C_{36}H_{51}O_{11}N$ = 673 40 An alkaloid from the root of *Aconitum ferox*, m 113 It is the bikh poison of Nepal

bilateral Pertaining to two or both sides

bile Gall, chola The yellow, brown, or greenish secretion of the liver, containing 14 % solids and 86 % water, d 1 026-1 032 **b acids** A group of acids found in bile, and related to hematin and cholane See *porphin, cholane* Their sodium salts aid digestion The principal acids are related as follows



where

1	glycocholic acid	$C_{26}H_{43}O_6N$
2	taurocholic acid	$C_{26}H_{45}O_7NS$
3	taurocholeic acid	$C_{27}H_{47}O_6NS$
4	glycocholeic acid	$C_{27}H_{45}O_5N$

and the split products are

5	cholic acid	$C_{24}H_{40}O_5$
6	choleic acid	$C_{25}H_{42}O_4$
	a glycine (NH_2CH_2COOH)	
	b taurine ($NH_2(CH_2)_2SO_3H$)	

b pigments The coloring matter of b , as,

red	bilirubin, XO_6
green	biliverdin, XO_8
blue	bilicyanin, XO_9
purple	bilipurpurin, XO_{10}
brown	bilixanthin, XO_{12}

where X is $C_{32}H_{36}N_4$

b salts The sodium salts of taurocholic and glycocholic acids, which occur normally in the bile

bilein A mixture of the alkali salts of the bile acids, obtained from oxgall

bilicyanin $C_{32}H_{36}O_9N_4$ = 620 3 A blue pigment obtained by oxidation of biliverdin

biliflavin A yellow pigment derived from biliverdin

bilifulvin Bilirubin

bilifuscin $C_{16}H_{20}O_4N_2$ = 304 6 A dark-brown powder obtained from bile pigments, insoluble in water, soluble in alcohol, acetic acid or alkalis, used as a reagent

bilin A mixture of sodium taurocholate and sodium glycocholate, the main constituent of bile

bilineurine Choline

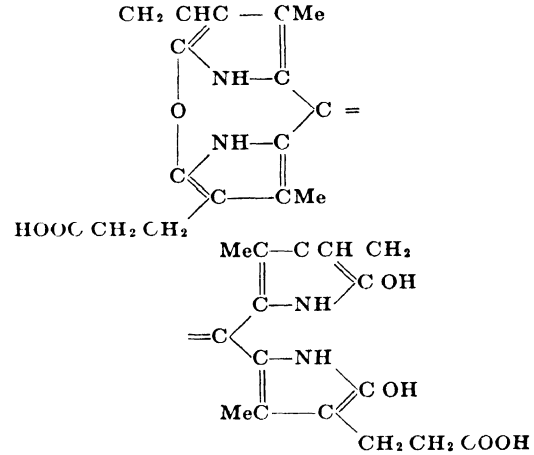
bilinigrin A black oxidation product of bilirubin

biliphain Bilirubin

biliprasin A green pigment derived from biliverdin

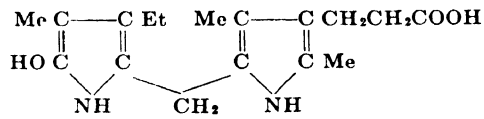
bilipurpurin Cholohematin A purple bile pigment

bilirubin $C_{32}H_{36}O_6N_4$ = 572 5 Bilifulvin, biliphain, cholepyrrhin, hematoidin The red coloring matter of bile which is structurally related to hematoporphyrin and hematin, it is derived from hemoglobin and causes coloring of the eyes in jaundice Reddish yellow needles, or an orange powder, m 192, insoluble in water, soluble in alkalis, acids or chloroform



Cf *porphin ring, cholothallin* **hydro-** Urobilin

bilirubinic acid $C_{17}H_{24}O_3N_2$ = 304 16 A monobasic acid containing two attached pyrrole rings It is formed from bilirubin and from hemin by reduction with hydriodic acid in glacial acetic acid Fischer's formula is



bilisoidanic acid $C_{24}H_{32}O_9$ = 464 6 An acid obtained from bile by treatment with nitric acid

biliverdic acid $C_8H_9O_4N$ = 183 08 A crystalline solid, m 114

biliverdin $C_{32}H_{36}O_8N_4$ = 604 5 An oxidation product of bilirubin A green amorphous powder, soluble in alcohol or glacial acetic acid It yields choletelin and the pigments biliflavin and biliprasin

bilixanthin $C_{32}H_{36}O_{12}N_4$ = 668 3 A yellowish brown oxidation product of bile pigments, q v

billion (1) A million millions, 10^{12} (British and German usage) (2) A thousand millions, 10^9 (Continental Europe and U S A usage)

Billroth's mixture An anesthetic consisting of 3 pts chloroform, 1 pt alcohol and 1 pt ether

biloidanic acid $C_{22}H_{32}O_{12}$ = 488 25 Norsolanellic acid An acid obtained by the oxidation of bile

bimetal A metal sheet made up of two layers and having special properties, as, corrosion resistance

bimolecular Pertaining to two molecules **b reaction** See *reactions, 2nd order*

binaphthalene $C_{20}H_{14}$ = 254 22 Naphthyl naphthalene, $C_{10}H_7$—$C_{10}H_7$ A group of hydrocarbons, as,

$\alpha\,\alpha'$- or alpha-	m 160, b 365
$\beta\,\beta'$- or beta-	m 187, b 452
$\alpha\,\beta'$- or gamma-	m 70

They form colorless crystals, insoluble in water, soluble in alcohol or ether

binaphthyl (1) The monovalent radical, $-C_{20}H_{13}$, derived from binaphthalene (2) Dinaphthyl

binarite Marcasite

binary compound A compound containing only two elements It may have two or more atoms, *e g*, NaCl, $FeCl_2$, $FeCl_3$, $SiCl_4$ **b mixture** A mixture of any two substances **b salt** A salt containing two bases, as $NaKSO_4$ **b system** Any combination possible with two metals, cf *phase rule, alloy*

binder A material used to hold solid substances together in a plastic mass, as, bitumen

bindheimite Native hydrous lead antimonate

binding Held together **b energy** The force which holds together the negatively and positively charged portions of an atom or molecule, cf ionization *energy*, lattice *energy*, solution *energy* **b screw** A screw in a perforated panel for connecting electric wires

bing Spoilbank Colliery refuse consisting of pyritic fine coal and shale

biniodide (1) Diiodide (2) A pharmaceutical name for (a) mercuric iodide, (b) mercuric potassium iodide

binitro See *dinitro-*

binnite The native copper-arsenic sulfide $2As_2S_3$ $3Cu_2S$

binocular microscope A microscope with two eyepieces giving a stereoscopic effect

binoxalate Bioxalate

binoxide Dioxide

bio A prefix meaning life, derived from the Greek "bios"

bioanalysis The determination of minute quantities of elements or compounds by means of bacteria, protozoa or protophyta

bioassay The determination of the activity of drugs by studying their effects on animals

biocatalysator A substance of the protoplasm that promotes growth

biocatalyst (1) Enzyme (2) Ergine

biochemical Pertaining to the matter-changes within an organism **b oxygen demand** B O D A chemical measure of the deoxygenating power of an effluent in terms of the difference between the Winkler oxygen value in contact with oxygen-saturated water before and after five days at 17 8°C

biochemistry A branch of chemistry dealing with the changes occurring in living organisms, *e g*, metabolism, respiration, etc

biocolloid Any glue-like substance of an organic nature, as, the glutin of bone glue

bioctyl Hexadecane*

biodyne A natural cellular respiratory factor

bioelement An element essential to life Principally those most abundant in organisms, but traces of rarer elements are in many cases also essential Cf *abundance, periodic chain*

DISTRIBUTION OF BIOELEMENTS

Order (1)	Mammals (2) per cent		Gymnosperms (3) per cent	
1	O	62 43	C	53 96
2	C	21 15	O	38 65
3	H	9 86	H	6 18
4	N	3 10	Al	0 065
5	Ca	1 90	Si	0 057
6	P	0 95	S	0 052
7	K	0 23	Fe	0 030
8	S	0 16	N	0 030
9	Cl	0 08	Ca	0 007
10	Na	0 080	K	0 006
11	Mg	0 027	P	0 005
12	I	0 014	Mg	0 003
13	F	0 009	Cl	0 002
14	Fe	0 005	No	0 001
15	Br	0 002	F	0 001
16	Al	0 001	Mn	0 001
17	Si	0 001		
18	Mn	0 001		
		100 00		100 00

biogen The inactive parent compound of bios

biogenesis The theory that all life comes from life, *e g*, that life can not be artificially created Antonym abiogenesis

biognosis The study of life

biological assay The determination of the active principles of a drug by determining the smallest quantity which will produce certain symptoms in animals It can supplement or replace chemical methods of analysis **b oxygen demand** Biochemical oxygen demand

biologics A group of preparations derived from living organisms which are used in therapy

1 *Antiserums*, producing passive or relatively temporary immunity
- A *antitoxic*, produced by immunization of horses and used to neutralize specific toxins, as, diphtheria, tetanus, scarlet fever, etc *antitoxin*
- B *antibacterial*, produced by injecting horses with bacteria, as antidysenteric, antipneumococcic, antiinfluenca *serum*

2 *Vaccines*, producing active or relatively permanent immunity and consisting of bacterial suspension, as, rabies *vaccine*

3 *Bacterial Antigens*, derived from bacteria and having immunizing power
- A *bacterial vaccines*, consisting of killed bacteria in suspension, as, catarrhal, furunculosis, pertussis *bacterin* (or vaccine)
- B *ectoantigens*, or washings from live pathogenic bacteria, as, gonococcus, pneumococcus, streptococcus *immunogen*
- C *toxoids* and *filtrates*, such as, diphtheria, staphylococcus toxoids, tuberculins, gonococcus filtrate

4 *Pollen and Protein Extracts*, used for diagnosing and treating hay fever, asthma, urticaria, dermatitis, etc

biology The science of living matter, its forms, functions, occurrence, behavior and evolution Branches of biology

1 Botanical branches (plants)
2 Zoological branches (animals)
3 Anthropological branches (man)

BIOLOGY The science of living things	*energy* transformation		Biophysics
	matter changes		Biochemistry
	structure of living things — MORPHOLOGY	cells	Cytology
		tissues	Histology
		organs	Anatomy
		organisms	Taxonomy
	functions of living things — PHYSIOLOGY	generative	Embryology
		sustentative	Metabolism
		correlative	Circulation and Nerves
	abnormal structure and function — PATHOLOGY	of plants	Phytopathology
		of animals	Zoopathology
		of man	Pathology
	development of live — ETIOLOGY	of the race	Phylogeny
		of individual	Ontogeny
	dwelling place — CHOROLOGY	of plants	Flora
		of animals	Fauna
		of both	Ecology
	prehistoric life — PALEONTOLOGY	of plants	Paleobotany
		of animals	Paleozoology
		of man	Ethnology

biosterol $C_{22}H_{44}O_2$ = 340 7 An alcohol resembling cholesterol It appears to have the growth-stimulating property of vitamin A, q v

biota The flora and fauna of a region

biotic Pertaining to life or living organisms

biotin (1) $C_{10}H_{16}O_3NS$(?) Vitamin H, 2-keto-3,4-imidazolido-2-tetrahydrothiophene-n-valeric acid A cyclic urea derivative from (*e g*,) agar It has growth-promoting properties (2) $C_{11}H_{18}O_3N_2S$(?) A very active constituent of bios (q v) occurring in wild yeasts and egg yolk, and isolated as the crystalline methyl ether, 1 part in 3×10^{11} effects yeast growth

bioluminescence The phosphorescence of living vegetable or animal organisms

biometry The application of statistics to biological science

biomolecule A molecule of protoplasm or a unit of living substance Cf *biomone, biophore, idioblast gene protoplasm micelle*

biomone A particle of living matter made up of biomolecules

bion (1) An individual living organism (2) The hypothetical life-element (Osburn), analogous to the electron the element of electricity

bionergy The "vital" force generated in living cells

bionomy The measurement of life phenomena

bio-osmotic The osmotic pressure of living cells

biophage A cell or organism feeding on living cells or living organisms

biophore Biomone The smallest particle of living matter (Weismann)

bioplasm Protoplasm

bioplast Micelle

biorization. Pasteurization under a pressure of 1-3 atmospheres

bios $C_6H_{11}O_3N$ = 133 2 A crystalline substance similar in character to a vitamin, which is found to be essential for the growth of certain types of yeast, m 223 Now known to consist principally of i-inositol, vitamin B_1 and pantothenic acid (q v) Cf *biogen*

biose (1) carbohydrate containing two hydroxy groups, as, $C_2H_4O_2$ Cf *tetrose, pentose, hexose* (2) Disaccharide

biosterin (1) A vitamin (2) Biosterol

biotite A brownish-black ferrous mica

biotoxin The toxins formed in the tissues of the living body

bioxalate Binoxalate, acid oxalate A salt containing the monovalent —HC_2O_4 radical

bioxindol Isoindigotin **dihydroxy-** Isatide **hydroxy-** Isatan

bioxyl Bismuthyl chloride

biozeolite A biological slime from sewage filters, which has zeolitic properties

biphenyl (1) $C_{12}H_{10}$ = 154 14 Phenylbenzene, Ph Ph Colorless scales d 1 041, m 71, b 254 insoluble in water, soluble in alcohol or ether (2) Diphenyl *o*-**amino-** Biphenylamine *p*-**amino-** Xenylamine **diamino-** $NH_2C_6H_4C_6H_4NH_2$ *o o'*- or **2 2'**- Colorless crystals, m 81 *o p'*- or **2 4'**- Diphenyline *p p'*- or **4 4'**- Benzidine **difluoro-** Antitussin **dimethyl-** Ditolyl **methyl-** Ph C_6H_4 Me = 168 10 Phenyltolyl *m*- or **3-** Colorless liquid, b 275 *p*- or **4-** Colorless liquid, b 265

b amine Ph $C_6H_4NH_2$ = 169 10 *ar*-Phenylaniline, aminobiphenyl Differs from diphenylamine, q v *o*- **2-** Colorless crystals m 45 *p*- or **4-** Xenylamine **b diamine** *o o'*- Diamino b *p p'*- Benzidine **b mercury** $(PhC_6H_4)_2Hg$ = 506 75 White scales, m 216, insoluble in water

biphenylene (1) Th hypothetical compound $C_6H_4C_6H_4$ (2) The bivalent radical, —C_6H_4-

C_6H_4— **b disazo** The bivalent radical, —N NC$_6$H$_4$C$_6$H$_4$N N— **b oxide** Dibenzofurane **b sulfide** Dibenzothiophen

BIPP A mixture of bismuth iodoform and paraffin, used as an antiseptic, it is harmless to tissues

bipropargyl C_6H_6 = 78 05 Dipropargyl, *1 5*-hexadiyne*, 1 5-hexadine, CH≡C CH$_2$ CH$_2$ C≡CH A colorless liquid, d 0 805, m −6 b 85 4

bipropenyl *2 4*-Hexadiene*

bipseudoindoxyl Indigotin

birch A tree of the genus Betula **b camphor** Betulinol **b oil** Sweet b oil, betula oil The essential oil from the bark of *Betula lenta*, black birch A colorless oil, d 1 1272–1 182, b 218–222, its chief constituent is methylsalicylate (oil of wintergreen) Used for flavoring, as an antirheumatic and antipyretic **b tar oil** A tarry oil from the wood of *Betula alba*, white birch A dark-brown oil with empyreumatic odor, d 0 886–0 950, soluble in alcohol ether, or chloroform The chief constituents are phenols and cresols, used as a disinfectant, antiparasitic and in leather dressing **b wood-carbon** Norit

bird-lime A viscid substance from the bark of the Ilex species and mistletoe It contains viscin, viscum and ilicic alcohol

birectification A precise method of analysing fermented liquors by fractional distillation

birefractive Doubly refracting

birefringence Double *refraction* **electrical-** *Kerr* effect

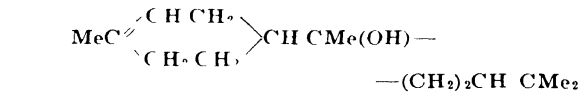
birotation Mutarotation The exceptionally high or low optical activity of a freshly-prepared aqueous solution of a sugar which, on standing or after boiling or the addition of ammonia, is reduced to normal

birthwort Serpentaria

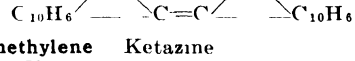
bis- A prefix indicating *twice*, generally applied to molecules made up of two similar halves or compounds

bisabolene $C_{15}H_{24}$ = 204 21 A monocyclic sesquiterpene from bisabol myrrh and star anise oil A colorless liquid, d 0 8727, b 139

bisabolol $C_{15}H_{26}O$ = 221 21 The alcohol



bisacenaphthylidene dione $C_{24}H_{12}O_2$ = 332 2 The homocyclic ketone, m 294

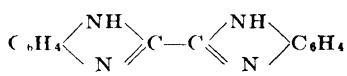


bisazimethylene Ketazine

bisazo- Tetrazo-

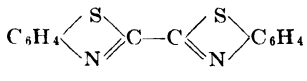
bisazobenzil $C_{14}H_8N_4$ = 232 2 The homocyclic azide Ph CN—CN$_2$ Ph

bisbenzimidazole $C_{14}H_{10}N_4$ = 234 2 The heterocyclic system related to indigo



Colorless crystals, m 305

bisbenzothiazole $C_{14}H_8N_2S_2$ The heterocyclic system



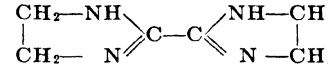
bischofite A native, hydrous magnesium chloride, $MgCl_2\ 6H_2O$

biscuit ware An unglazed, porous porcelain, which has been fired twice

bisdiazo- Tetrazo- b amine N_6H_3 = 73 06 The hypothetical compound NH N NH N NH, known as its derivatives Cf *hydronitrogen* **b hydrazine** N_6H_4 = 88 08 The hypothetical compound HN N NH NH N NH known as its derivatives

bisethylxanthate Ethylxanthogenate

bisglyoxalidine $C_6H_{10}N_4$ = 138 3 The heterocyclic system,

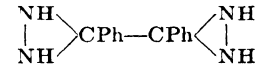


Colorless crystals, m 295

bisglyoxaline Glycosine

bishydrazi carbonyl Diurea

bishydrazibenzil $C_{14}H_{14}N_4$ = 238 3 The compound,

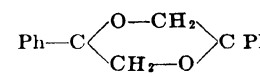


bismal $4C_{11}H_{12}O_{10}\ 3Bi(OH)_3$ = 2188 46 Bismuth methylenedigallate A grayish-brown powder, soluble in alkalis, used medicinally as an astringent in diarrhea

bismarck brown Triaminoazobenzene

bismarsen $C_{21}H_{21}O_{12}As_3Na_3S_3N_3Bi$ Bismuth sulfarsphenamine Brown amorphous powder, soluble in water, used in the treatment of syphilis

bismethylbenzoylcarbinol $C_{16}H_{16}O_2$ = 240 2 The heterocyclic compound,



Colorless crystals, m 92

bismite $Bi_2O_3\ 3H_2O$ Bismuth ocher A native bismuth oxide

bismon Colloidal bismuth metahydroxide Light-brown granules which produce an opalescent suspension with water

bismuth Bi = 209 00 An element of the arsenic group, atomic number 83 Bismutum, wismuth A pinkish, silver-white, brittle metal resembling antimony, $d_{20°}$ 9 78, m 269 2, b 1435 5, insoluble in water, soluble in acids It occurs native, as sulfide (bismuthinite), and in a few rare minerals, as, sulfobismuthide, telluride and vanadate The isotopes of bismuth are radium E = 210 4, thorium C = 212 4, actinium C = 212(?), and radium C = 214 4 Bismuth is tri- and penta-valent and forms two series of compounds

Derived from trivalent bismuth

bismuthides	M_3Bi
bismuthous compounds	Bi^{+++}
bismuthyl compounds	BiO^-
bismuthines	BiR_3

Derived from pentavalent bismuth

bismuthic compounds	Bi^{+++++}

Bismuth was discovered by an unknown alchemist It is mentioned by Basil Valentine in 1450 and described as a "bastard of tin" Its name is of obscure origin and comes probably from the Arabic, "wiss majat," a metal which easily melts, or German, "wismuth"

wiesen matte, a meadow B is used commercially in many alloys of low melting point (*e g*, lipowitz metal, wood metal, etc), as a constituent of type metal, and also in the manufacture of bismuth compounds and drugs, its insoluble salts cast x-ray shadows (b meal), the soluble salts are very toxic B is very diamagnetic Cf *Lipowitz alloy, rose metal, D'arcet metal* **tribromphenol-** Xeroform **triiodophenol-** Neoform **trimethyl-** Bismuthine

b acetate $Bi(OOCMe)_3$ = 381 1 Bismuthous acetate White powder soluble in acetic acid **b albuminate** An additive compound of albumin with bismuth, a gray powder, containing 9 % Bi, used to treat cholera and colics **b ammonium citrate** Transparent, shining, white scales soluble in water or alcohol **b benzoate** $Bi(OOCPh)_3$ = 572 15 Bismuthous benzoate A gray powder soluble in acids and used internally in stomach disorders and externally instead of iodoform **b betanaphtholate** Orphol **b borate** $BiBO_3$ = 267 9 Bismuthous borate A gravish powder soluble in acids It is an intestinal antiseptic **b borosalicylate** A grayish amorphous powder, decomp in water **b bromide** $BiBr_3$ = 448 8 Bismuthous bromide, bismuth tribromide White or yellowish crystals, d 5 604 m 210, b 453, decomp in water, soluble in ether or hydrobromic acid **b camphorate** $Bi_2(C_{10}N_{14}O_4)_3$ = 1014 A white powder, insoluble in water **b carbolate** Bismuth phenylate **b carbonate** Bismuthyl carbonate **b chloride** $BiCl_3$ = 315 5 Bismuthous chloride, bismuth trichloride White crystals, $d_{11°}$ 4 56, m 232 b 447, insoluble in water, soluble in alcohol, acetone or acids **b chromate** $Bi_2O_3\ 2CrO_3$ = 666 0 A yellow amorphous powder, insoluble in water, soluble in acids, used as a pigment **b cinnamate** Hetoform The bismuth salt of cinnamic acid **b citrate** $BiC_6H_5O_7$ = 398 04 White crystals, d 3 458, insoluble in water, soluble in ammonia water, used as a stomachic and astringent **b chrysophanate** $BiC_{15}H_9O_4 \cdot 2Bi_2O_3$ = 1394 07 Dermol A yellow amorphous powder, insoluble in water and used in skin diseases **b dichloride** $BiCl_2$ = 278 9 Black needles, d 4 86, m 163, decomp by water **b dithiosalicylate** (basic) Thioform **b gallate** $Bi(OH)_2C_7H_5O_5$ = 412 06 Dermatol, b subgallate A yellow powder (55 % Bi), insoluble in water, alcohol or ether, but soluble in alkalis It is an internal and external antiseptic and astringent **b glance** Bismuthinite **b gold** Au_2Bi, occurs naturally **b hydroxide** $Bi(OH)_3$ = 260 0 Bismuthous hydroxide A white amorphous powder, insoluble in water and alcohol, soluble in acids, used for manufacturing bismuth salts **b iodate** $Bi(IO_3)_3$ = 733 76 Bismuthous iodate A heavy white amorphous powder, insoluble in water, decomp by strong acids **b iodide** BiI_3 = 589 76 Gray glistening crystals, $d_{20°}$ 5 65, m 408, insoluble in water, soluble in KI solution **b iodosubgallate.** B oxyiodogallate **b lactate** $Bi(C_3H_5O_3)C_3H_4O_3$ = 386 07 White crystals, slightly soluble in water, used as an antiseptic **b loretinate** A surgical dusting powder, used as an iodoform substitute **b meal** A meal containing an insoluble bismuth salt given before an x-ray examination, so as to render the digestive organs visible **b methylene digallate** Bismal **b minerals** Bismuth ores occur in nature closely associated with arsenic and antimony Some are

native bismuth	Bi
guanajuatite	Bi_2S_3
bismuthinite (bismuth glance)	Bi_2S_3
tetradymite	Bi_2Te_3
joseite	Bi_2Te
wehrlite	Bi_3Te_2
gruenlingite	Bi_4TeS_3
bismite	$Bi(OH)_3$
bismuth ocher (bismuthite)	Bi_2O_3
bismutite	$Bi_2H_2CO_6$
bismuthosphaerite	$(BiO)_2CO_3$
bismuthosmaltite	$CoBi_3\ CoAs_3$
bismuth telluride	$Bi_2(S, Te)_2$

b molybdate, $Bi_2(MoO_4)_3$ = 898 1 A yellow powder, insoluble in water, soluble in acids **b naphtholate** Orphol **b nickel** A native mixture of bismuth and nickel sulfides **b nitrate** $Bi(NO_3)_3\ 5H_2O$ = 485 1 B ternitrate, b trinitrate White triclinic, deliquescent crystals, d 2 78, m 74, decomp on further heating, soluble in acids, decomp in water It is an astringent or antiseptic, used in diarrhea Cf bismuth subnitrate **b ocher** See b minerals **b oleate** $Bi(C_{17}H_{33}COO)_3$ = 1053 2 A yellow granular mass soluble in ether, used in the treatment of skin diseases **b organic compound** A compound in which aliphatic or aromatic hydrocarbon radicals are attached to bismuth (*e g*, bismuth trimethyl, bismuth triphenyl) **b oxalate** $Bi_2(COO)_6$ = 682 03 A white granular powder, soluble in acids **b oxide** (1) Commonly, bismuthous oxide (2) Any one of the three oxides Bi_2O_3 = bismuth trioxide or bismuthous oxide Bi_2O_4 = bismuth tetroxide Bi_2O_5 = bismuth pentoxide or bismuthic oxide **b oxybromide** Bismuthyl bromide **b oxychloride** Bismuthyl chloride **b oxyfluoride** Bismuthyl fluoride **b oxyiodide** Bismuthyl iodide **b oxyiodogallate** $BiI(OH)(C_7H_4O_4)$ = 504 98 B iodosubgallate, bismuthyl iodogallate, airol, airoform A voluminous light grayish-green powder, odorless and tasteless, insoluble in water, soluble in dilute alkalis or acids, used as a substitute for iodoform **b pentoxide** Bismuthic oxide **b permanganate** $Bi(MnO_4)_3$ = 566 5 Bismuthous permanganate A black powder, insoluble in water, soluble in acids It is an antiseptic, used as a dusting powder for wounds **b peroxide** Bi_2O_4 = 482 0 A brown powder, liberating oxygen at 150°C **b phenolsulfonate** Bismuth sulfocarbolate, bismuth sulfophenate A slightly pinkish powder, soluble in water, used as an antiseptic **b phenylate** $Bi(OH)_2OPh$ = 336 6 B phenol, -phenate, -phenolate, -carbolate A gray powder (80 % Bi), insoluble in water, used as an intestinal antiseptic **b phosphate** $BiPO_4$ = 304 0 Bismuthous phosphate A white powder, decomp by heat, insoluble in water, soluble in acids **b phospholactate** A white, crystalline powder, slightly soluble in water, decomp by heat, used as an intestinal antiseptic **b potassium iodide** $BiI_3\ 4KI$ = 1253 9 Yellowish crystals, soluble in water, used as (Dragendorff's) reagent for alkaloids **b potassium tartrate** $BiK(C_4H_4O_6)_2$ = 545 1 Colorless crystals, soluble in water, used as a reagent for glucose in urine **b propionate** $Bi(C_3H_5O_2)_3$ = 428 19 A white powder, insoluble in water, soluble

in acids **b pyrogallate** $Bi(OH)C_6H_3(OH)O_2$ = 350 04 Bismuth gallate, helcosol A yellow powder (60 % Bi), insoluble in water or alcohol, used as an intestinal antiseptic and dusting powder for wounds **b salicylate** $Bi(C_7H_5O_3)_3Bi_2O_3$ = 1744 04 Bismuth subsalicylate A white microcrystalline powder, insoluble in water, soluble in acids Used as an intestinal antiseptic, and dusting powder **b selenide** Bi_2Se_3 = 655 6 Black crystals, d 6 86, decomp on heating, insoluble in water or alkalis **b silver** A native form of silver, containing 16 % bismuth **b sodium iodide** BiI_3 4NaI = 1190 1 Red crystals, decomp in water, soluble in acids, an antiseptic and alterant **b subcarbonate** Bismuthyl carbonate **b subgallate** B gallate **b subnitrate** B basic nitrate A mixture of $Bi(OH)_2NO_3$ and $BiOH(NO_3)_2$ or of $(BiO)NO_3$ and (BiO)OH A white powder (79–82 % Bi), insoluble in water, $d_{15°}$ 4 928, decomp 260, soluble in acids An antiseptic or astringent, used in stomach and intestinal disorders, also as a b meal (q v), and as a dusting powder Cf *pearl white*(3) **b subsalicylate.** B salicylate **b sulfate** $Bi_2(SO_4)_3$ = 706 2 Bismuthous sulfate A white crystalline powder, decomp in water or if heated, soluble in acids **b sulfide** Bi_2S_3 = 514 2 Bismuthous sulfide, bismuth trisulfide Dark-brown rhombic crystals or powder, d 7 39, decomp on heating, insoluble in water, soluble in acids **b sulfite** $Bi_2(SO_3)_3$ A white powder of variable composition, soluble in acids **b sulfocarbolate** B phenolsulfonate **b tannate** A yellow powder resulting from action of tannic acid on bismuth hydroxide, insoluble in water, soluble in acids, and used as an antiseptic and astringent **b tartrate** $Bi_2(C_4H_4O_6)_3$ $6H_2O$ = 970 0 A white powder, d 2 595, insoluble in water, soluble in alkalis, acids and glycerol It is used in the treatment of Vincent's Angina **b telluride** See *b minerals* **b tetraiodophenolphthalein** Eudoxine **b tetroxide** B peroxide **b thiosalicylate** Thioform **b tribromide** B bromide **b tribromphenylate** Xeroform **b trichloride** B chloride **b triethyl*** $BiEt_3$ = 296 15 A colorless, oily liquid, d 1 82, b 107, insoluble in water, miscible with alcohol or ether **b trimethyl*** C_3H_9Bi = 254 07 Trimethyl bismuthine, $BiMe_3$ A colorless liquid, d 2 300, b 110 **b triphenyl*** $BiPh_3$ = 440 16 Triphenyl bismuthine Colorless crystals, d 1 585, m 78 **b trisulfide** B sulfide **b tungstate** $BiWO_3$ = 441 5 B wolframate A white powder, decomp in water, soluble in acids **b valerate** $Bi(C_5H_9O_2)_3$ = 512 22 A white powder, insoluble in water, soluble in acids, used as a sedative and antispasmodic **b violet** A triphenyl methane dye in combination with Bi, used as non-toxic antiseptic

bismuthi The official Latin for bismuth

bismuthic A compound of pentavalent bismuth **b oxide** Bi_2O_5 = 498 0 Bismuth pentoxide A brown powder which liberates oxygen on heating to 150°C, insoluble in water, soluble in concentrated alkalis or acids

bismuthide (1) A compound of the type M_3Bi_2, analogous to arsenide, stibnide (2) Bismuthosmaltide **sulfo-** Beegerite

bismuthine (1) An organic bismuth compound, BiR_3, analogous to arsine and stibine (2) Bismuthinite **ethyl-** $C_6H_{15}Bi$ = 296 12 Triethylbismuth, $BiEt_3$ A colorless liquid, d 1 82, b_{80mm} 107 **methyl-** C_3H_9Bi = 254 07 Trimethyl bismuth, $BiMe_3$ A liquid d 2 300, b 110 **phenyl-** $C_{18}H_{15}Bi$ = 440 16 Triphenyl bismuth, $BiPh_3$ A solid, d 1 585, m 78

bismuthinite Bi_2S_3 Bismuthine Bismuth glance Native bismuth sulfide

bismuthiol Mercaptosulfo thiobiazole A reagent for bismuth salts with which it gives a red precipitate, owing to the presence of the $(NH)_2NH(CS)_2$ group Cf *mercaptophenyl dithiodiazolone*

bismuthite $Bi_2H_2CO_6$ A native hydrous bismuth carbonate, $(BiO)_2CO_3$ H_2O, occurring as white or greenish earthy masses

bismuthosmaltite $Co(As,Bi)_3$ A native cobalt arsenide and cobalt bismuthide, or smaltite containing bismuth

bismuthosphaerite $(BiO)_2CO_3$ A native bismuth carbonate which occurs in yellow fibrous masses

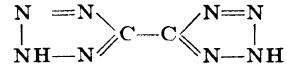
bismuthous A compound of trivalent bismuth The common bismuth compounds belong to this series **b oxide** Bi_2O_3 = 466 0 Bismuth oxide, bismuth trioxide Yellow tetragonal crystals, d 8 868, m 850, insoluble in water, soluble in acids Used in medicine similarly to bismuth subnitrate

bismuthyl The monovalent radical, BiO—, derived from trivalent bismuth **b bromide** BiOBr = 305 92 Bismuth oxybromide A yellowish-brown powder, $d_{15°}$ 8 082, insoluble in water, soluble in acids, used to treat dyspepsia and hysterics **b carbonate** $(BiO)_2CO_3$ = 527 02 Bismuth subcarbonate A white powder, d 6 86, insoluble in water, soluble in acids Used in ointments and face powders, and internally for stomach disorders **b chloride** BiOCl = 260 50 Bismuth oxychloride A white powder, $d_{15°}$ 7 717, insoluble in water, soluble in acids, used as an astringent and antiseptic It is decomp at red-heat **b dichromate** $(BiO)_2Cr_2O_7$ = 666 01 Orange-red crystals, insoluble in water or alkalis, soluble in acids **b fluoride** BiOF = 244 04 Bismuthoxyfluoride White crystals, $d_{20°}$ 7 55, insoluble in water, soluble in acids **b hydroxide** (BiO)OH is basic bismuth hydroxide **b iodide** BiOI = 352 4 Bismuth oxyiodide A white powder, insoluble in water, soluble in acids **b nitrate** $(BiO)NO_3$ H_2O = 305 03 Basic bismuth nitrate The main constituent of bismuth subnitrate, *q v*

bismutite Bismuthite

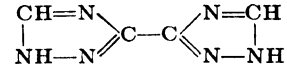
bismutosmaltite Bismuthosmaltite

bistetrazole $C_2H_2N_8$ = 138 3 Ditetrazyl The heterocyclic system



bistort Snakeweed adderwort The root of *Polygonum bistorte*, used as an astringent

bistriazole $C_4H_4N_6$ = 136 3 Ditriazolyl The heterocyclic system

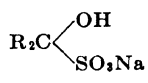


A colorless liquid, b 300

bisulfate Acid sulfate A compound containing the monovalent HSO_4— radical, derived from sulfuric acid

bisulfide Disulfide A binary compound containing two atoms of sulfur

bisulfite Acid sulfite An oxysalt containing the monovalent HSO_3— radical, derived from sulfurous acid **b compounds** Addition compounds of sodium bisulfite and an aldehyde or ketone of the general formula



bitartrate Acid tartrate A salt containing the monovalent $C_4H_5O_6$—radical, derived from tartaric acid

bithiophene Thiophthene

bitter (1) See *bitters* (2) An astringent taste, as that of quinine or magnesium sulfate **b almond oil** An essential oil from the seeds of *Prunus amygdala amara* bitter almond A pale yellow or colorless liquid, d 1 038–1 060, $[\alpha]_D$ + 0°10′ Its chief constituents are benzaldehyde, hydrocyanic acid, phenoxyacetonitrile, used for flavoring **b almond oil camphor** Benzoin **b apple** Colocynth **b ash** Quassia **b bark** Cinchona **b cucumber** Colocynth **b cups** Colocynth **b damson** Simaruba **b herb** Erythraea **b principle** A generic name indicating the bitter-tasting principle of a drug *e g*, due to alkaloids, resinoids, or glucosides **b root** Gentian **b salt** Magnesium sulfate **b spar** A ferruginous dolomite **b stick** Chirata **b wintergreen** Chimaphila **b wood** Quassia

bittern A waste liquid from the solar salt industry which contains the magnesium salts and bromides from the sea water

bitters (1) A group of drugs which includes gentian, quassia etc (2) Mineral waters characterised by a bitter or saline taste, (*e g* due to magnesium sulfate) (3) A medical preparation which contains the bitter principles of plants, as, Angostura b

bittersweet Dulcamara **American-, false-** Waxwort The root and bark of *Celastrus scandens*, a Celastraceae, used as diaphoretic It contains celastrine

bitumen A group of native, solid or semisolid, hydrocarbons, such as naphtha or asphalt, soluble in carbon disulfide They are rich in C and H, and burn with a sooty flame Cf *asphaltenes, carbenes, kerotenes, protobitumen* **albino-** A petroleum resin **asphaltic-** Asphalt **b elastic** A variety of bitumen

bituminous Having the qualities of bitumen **b coal** A coal which is rich in hydrocarbons and contains 50–80 %C **b materials** The compounds and mixtures used for pavings and roofings, as, asphalt, shales, tars **b resins** Dark red, transparent, fossil resins from brown coals which contain 80 % of wax Cf *retinite resins*

biurate Acid urate A salt of uric acid

biurea $C_3H_6N_4O_2$ = 118 08 The compound, $(NH_2CO\,NH{-}{-})_2$ Cf *diurea*

biuret $C_2H_3O_2N_3\,H_2O$ = 121 19 Allophanamide, allophanic acidamide, dicarbamylamine, carbamylurea, $NH_2\,CO\,NH\,CO\,NH_2$ Colorless needles, decomp 190, soluble in hot water or alcohol It is a condensation product of urea, used as a reagent **acetyl-** $C_4H_7O_3N_3$ = 145 11 $MeCO\,NH\,CO\,NH\,CONH_2$ Colorless needles m 193, soluble in water or alcohol

b reaction Pitrowsky reaction A test for the presence of peptides, proteins and iminoacids which contain the —CO NH— group To the solution add a drop of copper sulfate solution and potassium hydroxide, a violet color indicates the presence of b

bivalence The property of an element to combine with two univalent (or one divalent) atoms or radicals, as, ferrous, calcium, oxygen, etc

bivalent Any atom capable of combining with two univalent atoms or radicals Cf *divalent*

bivinyl C_4H_6 = 54 1 Erythrene, 1 3-butadiene*, vinyl ethylene, budiene, divinyl, pyrrolylene, $CH_2\,CH\,CH\,CH_2$ A colorless gas, b −3, used as an anesthetic **2- methyl-** Isoprene

Bixaceae, Bixineae A group of trees and shrubs, some of which yield important drugs

Gynocardia odorata	chaulmoogra seeds
	chaulmoogra oil
Bixa orellana	annatto

bixin $C_{25}H_{30}O_4$ = 394 2 $MeOOC(CH\,CH{-}CMe\,CH)_4CH\,CH\,COOH$ A dark red crystalline coloring matter from annatto, m 176, soluble in hot alcohol, used as a stain and dye

bixol $C_{18}H_{30}O$ = 262 3 $Me_2C{=}C\,CH_2\,(CMe{=}CHCH_2)_3\,CH_2OH$ A dark green, oily alcohol from the seeds of *Bixa orellana*, d 0 8845, n 1 5078, with parsley taste

Black, Joseph 1728–1799 A Scotch chemist and physicist, noted as a pioneer in experimental research He introduced the term "fixed air" for the gas (CO_2) given off from carbonates, opposed the phlogiston theory (q v), and developed the concept of latent heat

black A substance which reflects no colored rays of light, hence the absence of color **b alum** A mixture of aluminum sulfate and activated carbon used in water treatment **b antimony** Antimonic sulfide **b ash** An impure sodium carbonate with some unburnt carbon and uncombustible mineral matter produced in the soda wood pulp recovery process **b balsam** Peru balsam **b berry** See *rubus* **b body** A substance reflecting no light, that is a material which absorbs all radiant energy and transforms it into heat Cf *Stefan-Boltzmann equation* **b boy** Grass tree gum A resin from *Xanthorrhoea hastilis*, a Liliaceae, of Australia Used as a varnish and sealing wax **b cobalt** An earthy variety of native cobalt **b cohosh** Cimicifuga **b copper** Copper oxide **b damp** Choke damp **b dogwood** Frangula **b drops** Opium vinegar **b dyes** See *aniline black, chrome black, sedan black*, etc **b flux** A reducing agent used in assaying, made by burning together 1 part of potassium carbonate and 3 parts of argol **b fish oil** Malon oil **b haw** *Viburnum prunifolium* **b hellebore** The rhizomes of *Helleborus niger*, which are used, as a fluid extract, as a cathartic or diuretic **b henbane** Hyoscyamus **b indian hemp** Apocynum **b jack** Sphalerite **b lead** (1) Plumbago (2) Alquifou **b leg** Anthrax **b lotion** See *lotion* **b manganese** Pyrolusite **b metal** An electrolytic deposit in a black form of certain metals *e g* platinum, palladium, etc **b mustard** Sinapis nigra **b pigments** See *bone black graphite, ivory black lamp black*, etc **b potassium** Suint ash **b powder** An explosive consisting of 62–75 % KNO_3, 10–19 % S, and 12–5 % charcoal **b precipitate** Mercurous nitrate **b silver** Stephanite **b stain** Table top impregnation **b tellurium** A native telluride, of gold and lead (Pb, Au)-(Te S) **b tin** Cassiterite **b willow bark** The bark of *Salix nigra*, used in the form of fluid

extract as bitter tonic, anaphrodisiac and antiperiodic

Blackmar oil thief A device for taking oil samples from tank cars

blackstrap An inedible grade of molasses A by-product of sugar refining used as a source of alcohol

Blagden's law The lowering of the freezing point of a solution is in proportion to the amount of dissolved substance present Cf *Raoult's law, Coppet's law*

Blair oven A drying oven used in iron analysis

blairmorite A rock containing 71 % analcite, found in Alberta (Canada)

Blaise reaction A Grignard reaction (q v)

blanc fix(e) Synthetic barium sulfate produced by the action of barium chloride on aluminum sulfate, used as a pigment for coating paper

blanch A lead ore imbedded in rocks

blanching liquor A solution of calcium hypochlorite

blangel Silica gel used as a dehydrating agent, and impregnated with a cobalt salt to indicate by a color change whether it is in the hydrated or dehydrated state

blast (1) To smash to pieces by an explosive (2) To subject a material to a hot firing (3) A current of hot gases (4) A nucleated red blood corpuscle **b burner** A large blow-pipe or bunsen burner in which compressed air is blown into the flame **b furnace** A smelting oven, with an air current, used for the manufacture of pig iron **b lamp** B burner

blasting The process of loosening natural deposits of rocks and other materials by explosives **b gelatin** A high-explosive consisting of a 5–10 % solution of collodion cotton in nitroglycerin, (cf *gelignite*) **b oil** Nitroglycerin **b powders** Non-detonating explosives, deflagrating powder The black granular powders used for mining and road building, as black powder

blastokolin The natural inhibitor to ripening occurring in apples It is probably associated with malic acid

Blau gas A fuel gas for airships produced by cracking gas-oil at 550–600°C It consists of saturated paraffin hydrocarbons with some hydrogen and ethylene, its density equals that of air

bleaching (1) The whitening and removal of natural impurities from materials by chemical or physical agents *e g* chlorine or exposure to sunlight (2) Decolorizing textile fibers or paper pulp with calcium hypochlorite or other bleaching materials **b materials** A group of oxidizing or reducing agents, such as, sulfur dioxide, sodium acid sulfite, hydrogen peroxide calcium hypochlorite, chlorine water or oxides of nitrogen **b powder** Chloride of lime A compound formed by passing chlorine gas over dry slaked lime When fresh it is principally calcium oxychloride, but when it absorbs moisture it is converted into a mixture of calcium chloride and hypochlorite

Bleeker method A process for the reduction of vanadium compounds by electrolysis

blende (1) Sphalerite or zinc blende Cf *Sidot's b* (2) A sulfide ore, as, antimony b , manganese b Cf *glance*

blennostasin $C_{19}H_{22}ON_2{\cdot}2HBr$ = 456 05 Cinchonidine dihydrobromide Yellow crystals, used as a vasoconstrictor

blick The brightening of a noble metal during cupellation owing to adsorption of the outer layer of lead oxide

blister steel A steel of finely granulated texture Cf *cementation*

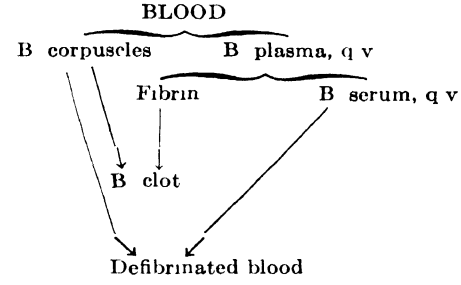
blistering beetle Cantharides

block tin An alloy of tin with iron, cobalt, lead, antimony and arsenic

blodite, bloedite, blodit Astrakanite

Blondlot rays n-*Rays*

blood A fluid that circulates in vertebrates through the heart, arteries and veins, and supplies nutritive materials to all parts of the organism A red, homogeneous liquid, d- 1 045–1 075, Δ of freezing point −0 56°C, pH = 7 35, constituting $\frac{1}{13}$ of the body weight and containing 2 2 % solids and 98 % water in an extremely delicately adjusted equilibrium of salts, proteins, enzymes and organised particles (b corpuscles)



The functions of blood are

1 It carries nutritive materials from the intestines to all cells and tissues of the organism, and oxygen from the lungs to the tissues

2 It removes the waste products from the tissues, and carries them to the kidneys, lungs, intestines or skin

3 It provides for metabolic co-ordination of the body by the distribution of internal secretions from one organ to another

4 It plays an important rôle in the defense of an organism against infection, (by equalizing temperature changes), and in maintaining the isotonic condition of the organism

TRANSPORT OF MATTER AND HEAT BY MEANS OF THE BLOOD

Gain	*Organ*	*Loss*
oxygen	lungs	carbon dioxide, water, heat
	kidneys	urea, salts, water
	skin	salts, water, heat
carbohydrates	liver	carbohydrates
heat, waste-matter	tissues	glucose proteins, fat and oxygen
heat, glucose, amino-acids fat, etc	intestines	
lymph, salts	lymphatics	

Cf *porphin fibrin hemoglobin respiration immunity* **arterial-** Bright-red b rich in oxygen or oxy-hemoglobin **beaten-** Defibrinated b **clotted-** A thick, semi-solid mass consisting of blood corpuscles imbedded in a network of precipitated fibrin **defibrinated-** A red homogeneous liquid, consisting of blood corpuscles and serum **dried-** The collected b of slaughtered animals dried and ground for use as a fertilizer It should contain not less than 12 % N in organic form **venous-** Dark-

red b , rich in carbon dioxide or reduced hemoglobin Cf *b gases*

b alkalinity The buffer quality of blood Blood is nearly neutral (pH = 7), but it can neutralize large quantities of acids because of its dissolved sodium carbonate, sodium bicarbonate, and sodium biphosphate (see *buffer solution*) **b amylase** An enzyme of the blood converting glycogen or starch to a reducing sugar **b analysis** The microscopical or chemical examination of blood **b apparatus** A device for determining the O_2 and CO_2 content of the blood **b capsules** Wright's capsules A glass tube drawn out to capillaries one which it bent backward and used for taking blood samples for microscopical examination **b cast** The blood fibres observed in urine by microscopic examination **b clot** A clump of coagulated blood, which contains the fibrin and blood corpuscles **b collector** Keidel's blood collector An evacuated ampule with which blood is withdrawn for blood tests **b count** The determination of the number of blood cells in a definite volume of blood **b composition** Blood consists of a liquid (plasma q v) and cellular elements The plasma contains the serum (q v) and fibrinogen, the cellular elements are the red and white blood corpuscles and the blood plates The main constituents of the serum are albumin, globulin, glucose and salts The red blood corpuscles contain the oxyhemoglobin, lecithin and some salts, while the fibrin ferment is in the white blood corpuscles **b crystals** Hemin **b elder,** Ebul **b enzymes** The enzymes or ferments of the blood, as, amylase, invertin, glycolytic enzymes, proteolytic enzymes, cholesterases and lipases **b gases** The gases of the blood are carbon dioxide oxygen and nitrogen *E g* , an analysis of the blood of cats shows

10 cc of	CO_2	O_2	N_2
arterial blood	25 07 cc	13 60 cc	1 00 cc
venous blood	40 83 cc	9 93 cc	0 77 cc

b glycolysis The power of the blood plasma to break down glucose into decomposition products, the nature of which is uncertain **b hemoglobin** The coloring matter or chromoprotein of blood (see *hemoglobin*) which breaks down to hematin and hemin (q v) and these, in turn to hematoporphyrin (q v) which is isomeric with bilirubin **b hydrogen ion concentration** The mean value at 18°C is 6×10^{-8}–2×10^{-8}, corresponding with pH = 7 2–7 7, hence, b is weakly alkaline **b osmotic pressure** 7 3 atmos (freezing point method) **b pigment** Hemoglobin Cf *cytochrome* **b plasma** The liquid portion of the blood 1000 grams of blood plasma contain

water	901 51 gm
solids	98 49 gm
These solids are	
albumin	81 92 gm
salt	8 51 gm
fibrin	8 06 gm
The salts are	
sodium chloride	5 546 gm
sodium carbonate	1 532 gm
calcium phosphate	0 298 gm
potassium chloride	0 359 gm
potassium sulfate	0 281 gm
sodium phosphate	0 271 gm
magnesium phosphate	0 218 gm

b platelets Thrombocytes A structural element of the blood containing cytozyme which is essential in stopping bleeding by coagulating the blood It is a commercial product (*e g* , Coagulen Ciba) **b root** Sanguinaria **b serum** The liquid portion of the blood, from which the fibrin is removed, d 1 0292 osmotic pressure 6 6 atmos

1000 grams of serum contain

water	908 84 gm
solids	91 16 gm
The solids are	
albumin etc	82 59 gm
salts	8 57 gm
The salts are	
sodium chloride	5 591 gm
sodium carbonate	1 545 gm
potassium chloride	0 362 gm
calcium phosphate	0 300 gm
potassium sulfate	0 283 gm
sodium phosphate	0 273 gm
magnesium phosphate	0 220 gm

b serum, artificial Loeffler's mixture A culture medium which consists of 250 cc glucose bouillon, 750 cc horse or beef serum **b sugar** The carbohydrates of the b , as, glucose **b stone** (1) Hematite (2) Jasper

bloom (1) The fluorescence of lubricating oils (2) The delicate coating which covers fresh fruit or leaves (3) The cloudy appearance produced by aging on the surface of varnish on pictures, as mastic varnish (4) The appearance of a gray or white fluffy film on a material (5) The crystallization of a component on the surface of a material is on chocolate where fat or sugar may form a b

blowpipe (1) A metal tube tapering to a fine point, straight or bent at a right angle It is used to blow air into a flame and to direct it as a fine conical tongue on the particles to be heated in qualitative, mineralogical or preliminary analysis, soldering or melting in dentistry, or jewelry manufacture (*2*) A blast burner **b analysis** The methods of detecting qualitatively the composition of minerals alloys or inorganic materials by observing their behavior in the bunsen flame and performing flame test, bead test, and reactions on charcoal or plaster of Paris with the aid of the blowpipe

SYSTEMATIC BLOWPIPE ANALYSIS

Group I Substance is tested upon charcoal in the oxidizing flame

A White, glowing, non-fusing mass

1 Dissolve in a few drops HCl and make flame test

orange	calcium
red	strontium
green	barium

2 Moisten the hot mass with a drop of cobalt nitrate solution and expose again to oxidizing flame

rose colored mass	magnesium
blue colored mass	aluminum
green colored mass	zinc

B Dark metallic mass or dark metallic granules Scrape off charcoal and powder

1 Particles are attracted by magnet Perform bead test

brown	iron or nickel
blue	cobalt

a Dissolve a particle in HCl and moisten filterpaper impregnated with $K_4Fe(CN)_6$
blue iron
2 Particles are not magnetic Perform bead test
green copper or chromium
purple manganese
b Part of the material is mixed with KNO_3 and Na_2CO_3 and melted on platinum foil
yellow flux chromium
green flux manganese (and chromium)
If green, moisten with water, dry with filterpaper and add a drop of $AgNO_3$
red spot chromium
c Dissolve in conc HCl, filter, and add NH_4OH
blue color copper

C Fused mass which runs into the charcoal Perform flame test
yellow sodium
lilac potassium

Group II Substance is mixed with sodium carbonate and tested on charcoal
A Formation of a white smoke with a white coat or sublimate, or only a white sublimate
odorless smoke antimony
smoke of garlic-like odor arsenic
white sublimate tin
B Formation of colored coats or sublimates with or without metallic buttons or globuli
orange-yellow sublimate cadmium
brown sublimate with white edge bismuth
white sublimate becoming green if moistened with cobalt nitrate solution and heated zinc
yellow sublimate with metallic globulus lead
C No sublimate, only metallic globules
white silver
yellow gold

Group III Substance is heated in the bottom of a dry glass tube
A White sublimate ammonium salts, mercury
1 Mixed with sodium carbonate and heated
ammonia odor ammonium salts
gray sublimate mercury
B Yellow sublimate sulfur or sulfides

Group IV Substance is mixed with potassium bisulfate and heated at the bottom of a glass tube
A Colorless vapors sulfites, chlorides, fluorides
1 White fumes with glass rod moistened with ammonia hydrochloric acid
2 attacking the glass hydrofluoric acid
B Green vapors chlorine, chlorates
C Brown vapors bromine, bromides
D Purple vapor iodine, iodides

Group V
A Heated with copper powder in glass tube
brown vapor nitrates, nitrites
B Heated in glass tube, alcohol added
acetic ether odor acetates
C Powdered substance moistened and burned on magnesium-ribbon
PH_3-odor on moistening phosphorus

blown oils Polymerized oils, oxidized oils Any oil, as, linseed, grapeseed or fish oil, which has been oxidized by passing through it a stream of air, thereby converting it into a fast drying oil, used for paints and varnishes

Bloxam, Charles 1831–1887 An English analytical chemist noted for his writings

blubber oil Whale oil

blue A color of the spectrum of shorter wavelength than green, but longer than violet (wave-length, 0 000047 cm) **Egyptian-** native copper aluminate **b cohosh** Caulophyllum **b copper** A native amorphous form of copper sulfide, CuS **b copperas** Copper sulfate **b cross** Ph_2AsCl Diphenyl chlorarsine, D A A nose irritant, m 39, used as a poison gas in warfare **b dyes** See *alizarin b* , *alkali b* , *anthracene b* , *basic b* , *cyanin b* , *methyl b* , *methylene b* , etc **b gum** Eucalyptus **b iron ore** Vivianite **b john** A native, crystalline copper sulfate with fluorspar **b mass** Mercury ointment **b pigments** See *Chinese b* , *cobalt b* , *copper b* *indigo*, *prussian b* , *smalt*, *Turnbull's b* , *ultramarine* **b print** A photographic copy made on ferri-ferrocyanide paper and fixed by washing with water **b powder,** Zinc dust **b salt** Crystallised *nickel sulfate* **b stone** A native, crystalline copper sulfate Cf *b john* **b unit** A method of expressing the vitamin A potency of a substance in terms of the intensity of the blue color produced with antimony trichloride Cf *Carr-Price value* **b verdigris** Copper acetate **b verditer** Basic *copper carbonate* **b vitriol** (1) Chalcanthite, a native copper sulfate (2) Crystallized copper sulfate

blushing The turbidity of lacquers and varnishes due to the precipitation of the resins in the solution caused either by moisture or evaporation of the solvent Cf *bloom* (3)

board foot A measure of the volume of boards sawn from logs It is the volume of a board 1 in thick and 1 sq ft in area, *i e* , one twelfth of a cu ft Cf *cunit cord fastmeter*

Board of Trade unit B T U The British unit of electrical energy 1 B T U = 1 kilowatt hour $= 3\,6 \times 10^6$ watt-secs (Cf *British Thermal Unit* = B Th U)

boart Bort

Boas reagent A solution of 5 gm resorcinol and 3 gm sugar in 100 gm dilute alcohol **B test** A test for hydrochloric acid in gastric juice A rose-red color develops on boiling with B reagent

boat A small elongated vessel of porcelain, quartz, or platinum which can be inserted in a combustion tube It is used in organic analysis

bobierite A native hydrous magnesium phosphate $Mg_2P_2O_7\ 8H\ O$, which occurs in guano as light colored crystals

B O D Biochemical oxygen demand

bodies (1) A group of biochemical substances which have a similar structure (2) A group of cellular structures or definitely shaped substances found in the protoplasm **acetone-** Substances such as acetone, aceto-acetic acid, or β-oxybutyric acid, when found in urine **alloxur-** A compound of uric acid and alloxan, secreted in the urine, as the purine bodies **Buchner-** Any defensive protein of the organism **purine-** Any derivative of uric acid, as xanthine, guanine, adenine etc

body (1) The trunk of an animal or plant (2) The largest part of an organ (3) The consistency or viscosity of a liquid (4) A limited portion of matter (5) The strength of a liquid, as wine **black-** See *Stefan-Boltzmann equation*, *black body* **b fluids** See blood, lymph and

internal secretions **b tube** The portion of the microscope which carries the objective, and inside which slides the draw-tube

boehmite A form of bauxite, Al_2O_3,H_2O

Boerhaave, Herman 1668–1738 A Dutch scientist and pioneer of modern chemistry, noted for his famous textbook

bog A marsh or morass **b berry** The fruit of *Vaccinium oxycoccus*, or cranberry **b butter** Butyrelite A soft mineral occurring in marshes **b iron ore** Bogore **b manganese** Wad **b ore** Bogore

Bogert, Marston Taylor 1868– An American chemist noted for his research in synthetic organic chemistry

boghead A carbonaceous rock, or cannel with a high ash content, consisting chiefly of iron carbonate **b naphtha** Photogen

bogiron ore Bogore

bog-manganese Wad

bogore Bogiron ore, marsh ore brown iron ore brown hematite, brown ocher limonite A hydrous ferric oxide, $2Fe_2O_3\,3H_2O$ with some ferrous carbonate, from marshy places, a source of iron

bohemium Bo The element, atomic number 75, claimed to be discovered by the Bohemian scientists J Heyrowsky and Doleysek (1925), as an impurity in magnesium It appears to be identical with the rhenium previously discovered by Naddack, Tacke and Berg

boil To cause quick ebullition or vaporization by means of heat or low pressure or both

boiled Describing a liquid which has been made to boil **b oil** A linseed oil which has been heated to 210–260°C, and thereby hardens more readily, used in varnishes and lacquers

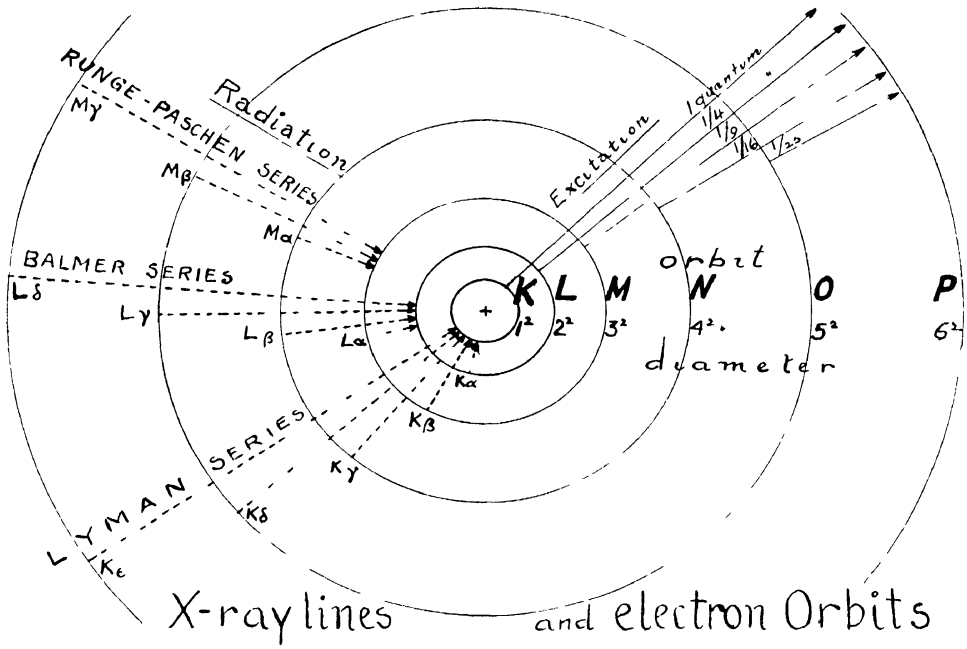
boiler An open or closed vessel for evaporating liquids, cooking food, or generating steam **vacuum-** A closed vessel in which evaporation of a liquid is caused by low pressure, with or without the application of heat

b compound A substance used to prevent the formation of b scale Cf *water softening* **b fluid** A solution which prevents the formation of a compact b incrustation **b incrustation** The insoluble mass deposited on the bottom and sides of a vessel in which hard water

formula An expression which connects the quantum theory with that of spectrum lines For the hydrogen series, $N = [2\pi^2me^4(M + m)]/Mh^3$, where e = charge and m = mass of an electron, M = atomic weight of hydrogen and h = Planck's constant The value of N is 109,678 7 **B formula for Rydberg's constant** An equation relating the constants e/m, e, h and c as derived from B theory

$$R_\infty = [2\pi^2e^5]/[h^3c^3e/m]$$

Cf *Lewis-Adams formula constants* **B's theory** Spectrum lines are produced (1) by emission of radiation (energy) when electrons drop from an orbit of greater to lower energy (energy levels), or (2) by absorption of radiation (energy) when the electrons move from an orbit of lower to higher energy Cf *quantum spectrum series Stoner quanta correspondence principle* See figure



Bohr theory

Bohr, Niels 1885– A Danish physicist, and Nobel prize winner (1922), noted for his theory of atomic structure **B atom** A hypothesis of atomic structure (q v) which assumes that the electrons move in circular or elliptical orbits around a positive nucleus, resembling an infinitesimally small solar system **B and Coster notation** See *quantum numbers* **B**

has been evaporated It consists of calcium and magnesium carbonates and sulfates **b mud** A loose deposit of b incrustations **b scale** A compact and thick layer of successive deposits **b stone** B scale

boilers A group name for nitrocellulose and lacquer solvents (q v), arranged in order of their boiling points **low-** b below 100°C **medium-** b near 125°C **high-** b from 150–200°C

boiling The state of ebullition or the brisk change from the liquid to the vapor state **b point** B p, b The temperature at which, under atmospheric or any other specified pressure, a liquid is transformed into a vapor, *i e*, the temperature at which the vapor pressure of the liquid equals the pressure of the surrounding gas or vapor The temperature of the reverse phenomenon is the condensation point Cf *Clapeyron equation* **absolute b point** The b on the absolute scale, *e g*, x°C + 273 = (x + 273)°A **b p apparatus** A device for determining the boiling point of a liquid under a definite pressure **lowering of b p** A decrease in pressure lowers the boiling point, *e g*, by lowering the pressure 10 mm water will boil 0 37°C lower **b p elevation** The presence of a dissolved substance raises the boiling point of a liquid, and the rise is a function of its molecular weight Hence a method of determination of the latter Cf *Raoult's Law Beckmann's apparatus*

Boisbaudran, Paul Émile Lecoq de 1838–1912 A French scientist, noted as discoverer of gallium samarium and dysprosium

boldine $C_{19}H_{21}NO_4$ = 327 17 An alkaloid from the leaves of *Peumus boldus* (Monimiaceae) A grayish-white powder, insoluble in water, soluble in alcohol, ether, or chloroform Used as a hypnotic and in hepatic and biliary disorders Cf *laurotetanine* **b hydrobromide** $C_{30}H_{53}O_8HBr$ = 621 34 White crystals, soluble in water, used as a hypnotic and local anesthetic

boldo The dried leaves of *Peumus boldus*, a Chilean tree (Monimiaceae) It is a tonic, antirheumatic and antipyretic

boldoglucin $C_{30}H_{52}O_8$ = 541 5 A glucoside from the leaves of *Peumus boldus* A thick syrupy liquid used as a narcotic and hypnotic

bole (1) A fine clay colored by the presence of iron (2) The trunk or stem of a tree (3) A measure of corn, equals 6 bushels **red-** Ocher **white-** Kaolin

boleite A native hydrous oxychloride of lead, silver, and copper which occurs in blue crystalline masses at Boleo, Lower California

Boletus A genus of Fungi or mushrooms belonging to the Basidiomycetes

Bologna phosphorus Luminescent barium sulfide

bolometer A device for measuring minute quantities of radiant heat by registering the change in the conductivity of a black body, used in spectroscopy

bolting cloth A fabric of unsized silk used for making sieves

boltonite Mg_2SiO_4 A native magnesium silicate A variety of forsterite

Boltzmann's constant k = 1 372 × 10^{-16} erg/°C The gas constant, R expressed per molecule If m is the number of molecules R = PV/Tm **B equation** See *molecular free path* **B's law** The law of the equipartition of energy The total kinetic energy of a system, due to translation, rotation, vibration, etc, is equally divided between all the degrees of freedom The energy per degree of freedom is ½RT per gram molecule

bolus (1) Masticated food ready to be swallowed (2) Kaolin

bomb (1) A projectile of iron or steel filled with explosive, poisonous, or incendiary substances, and used in chemical warfare (2) A heavy iron tube filled with a substance which is to be oxidized for the determination of its heating value (3) Radium in concentrated form (1–5 gm units) used for intensive local treatment, e g of cancer **b calorimeter** See *calorimeter*

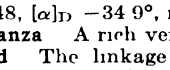
bombard To expose to the rays of radioactive substances, or to converging cathode rays

bombardment Exposure to the rays of radioactive substances, *e g*, the exposure to cathode rays focused on a point as in the X-ray tube, or the hitting of the atomic nuclei by high speed α-particles and the disruption of the hydrogen sub-atoms composing it (Rutherford)

bombiosterol $C_{27}H_{46}O$ = 386 32 A sterol m-148, $[\alpha]_D$ −34 9°, in chrysalis oil

bonanza A rich vein of ore

bond The linkage between atoms thought to consist of an electron-pair rotating between two kernels and forming an electro-magnetic vector along axis *ab*



The nature of the atoms will give the following types

I *Atomic b* Each atom contributes one electron,

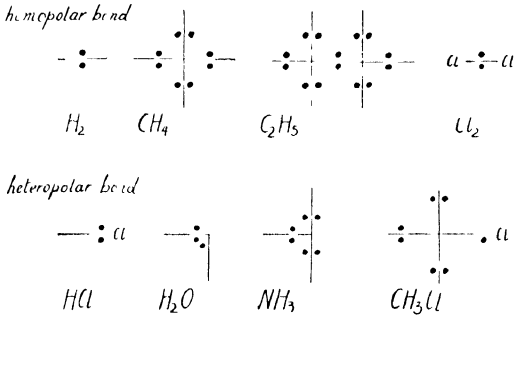
1 *homopolar b* (**nonpolar**) The electron-pair is held equally by both kernels, neither of which becomes negative with respect to the other, a = b, as in H_2, Cl_2, CH_4 etc

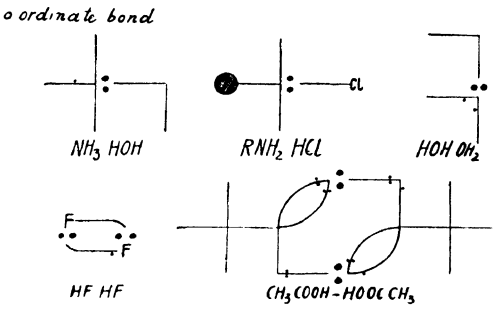
2 *heteropolar b* (**polar**) The electron-pair is held unequally, hence one kernel becomes negative and the other positive, a > b, as in HCl, H_2O etc

II *Molecular b* One atom contributes both electrons

3 *coordinate* b (**semipolar**) An unshared electron-pair of an octet on a kernel (like N, O, F etc) is shared by a kernel having an incomplete octet (generally H, also Li, Be, B etc)

These three types of b are illustrated by *electronic* structure symbols in which the heavy type dots represent the electrons of the particular b, their distances on the lines are a measure of the force shared by each kernel, thus





Cf *valence, linkage, associated* and *normal liquids, combination, compounds, atomic radius, molecular diagram, chelate*

bondu A corrosion-resisting aluminum alloy containing 2–4 % Cu, 0 3–0 6 % Mn and 0 5–0 9 % Mg Cf *aceral, aerometal*

bonducin $C_{14}H_{18}O_6$ = 263 1 A bitter principle of bonduc seeds, *Caesalpinia crista*, a Leguminosae A white bitter powder, insoluble in water, used as a febrifuge

bone The skeletal material of the vertebrates **b ash** An impure calcium phosphate The remains of burnt animal bones, used as fertilizers, contain 35–38 % P_2O_5 **b black** A charcoal made from bones and blood which is usually impure, used to refine sugar, oil etc **b earth** B ash **b meal** Finely ground animal bones used as fertilizer, it contains 3 3–4 1 % N, 20–25 % P_2O_5 *steamed-* Finely-ground bones, which have been previously steamed under pressure to remove the glue They contain 1 6–2 5 % N, 25 % P_2O_5 **b oil** Animal oil, Dippel's oil A tarry oil obtained by dry distillation of bones, d 0 900–0 980, soluble in water The chief constituent is pyridine Used as an insecticide and in organic synthesis, a popular panacea for many disorders **b phosphate** Calcium phosphate **b tallow** Soft grease obtained by boiling fresh bones, used to make cheap soaps **b turquoise** Fossil bones, or teeth colored with $Fe_3P_2O_8$ **b wax.** See *wax*

bongkrekik acid The compound $C_{12}H_{18}O_3$, produced by the action of certain bacteria on coconuts

boost To overload or place an excessive strain on an engine, or when charging an accumulator

boot density bottle A specific gravity bottle containing about 5 cc and having double walls with a vacuum between Used for determining specific gravities at constant temperatures

boracic acid Boric acid

boracite $Mg_7Cl_2B_{16}O_{30}$ A native magnesium chloro-borate which occurs in white transparent isometric crystals at Stassfurt, hardness 7, d 2 9–3

boracium The original name of boron (Davy)

boraginaceae Borage family, a group of herbs some of which yield drugs

Alkanna tinctoria	alkanet
	alkannin
Symphytum officinale	comfrey
Borago officinalis	borage
Pulmonaria officinalis	lungwort

boral Aluminum borotartrate, used as an antiseptic and astringent

borane Boron hydride

borate A salt of boric acid **bi-** Acid borate A salt of the type MH_2BO_3 **di-** Pyro-b **hypo-** A salt of the type MH_3BO **meta-** A salt containing the monovalent $—BO_2$ radical **ortho-** Borate **per-** A salt containing the monovalent $—BO_3$ radical **pyro-** A salt containing the divalent $>B_4O_7$ radical **tetra-** Pyro-

boratto A silk and wool fabric

borax $Na_2B_4O_7\ 10H_2O$ Zala, tinkal A native sodium tetraborate, found in California, Nevada, Oregon and Asia Minor, used as cleaning agent, antiseptic, flux, etc **b bead.** A crystal of borax melted in the loop of a platinum wire until it is transparent It is colored by metallic oxides, see *blowpipe analysis* **b carmine** See *Grenacher stain, Nikiforoff stain.* **b glass** (1) Fused borax, used as a flux (2) See *glass* **b methylene-blue** Sahli stain

Bordeaux B Acid Bordeaux, α-naphthalene-azo-β-naphthol-3 6-disulfonic acid An indicator for pH range 10 5 (pink) to 12 5 (orange) **B colors** A group of artificial coloring matters for foodstuffs **B mixture** (1) A mixture of equal weights of copper sulfate and lime in water, (2) a solution of copper arsenate and phenols Used as insecticides

Bordet test An agglutination test for the differentiation of human and animal bloods

borethyl Triethyl borine

boric acid H_3BO_3 = 62 9 Boracic acid, fumarole acid, $B(OH)_3$ Triclinic white crystals, $d_{15°}$1 4347, m 185, soluble in water alcohol or glycerin Used as a reagent, and in the manufacture of borates It is found in the volcanic lagoons of Toscana **meta-** HBO_2 **ortho-** B acid **per-** HBO_3 **pyro-** $H_2B_4O_7$ **benzyl-** $C_7H_7B(OH)_2$ = 135 89 Benzylboron dihydroxide White crystals, m 161 **ethyl-** $C_2H_4B(OH)_2$ = 73 87 Ethylboron dihydroxide Colorless crystals, subliming 40

borickite Anhydrous phosphate of iron

boride A binary compound of negative boron with a more positive element or radical of the type, M_3B or BR_3

borine A compound of boron with an acyl or aryl radical, BR_3 **triethyl-** Borethyl BEt_3 A colorless liquid, b 95 **trimethyl-** Bormethyl BMe_3 Cf *methyl borate, ethyl borate* **triphenyl-** Borphenyl, BPh_3

borium Boron

bormethyl Trimethyl *borine*

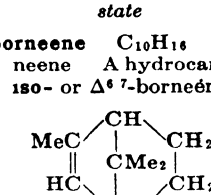
Born-Haber cycle The relationship of U = lattice energy of crystals I = ionization potential E = electron affinity, S = heat of sublimation D = heat of dissociation and Q = chemical heat of formation, can be expressed by the diagram

$$[MX]_{crystal} \xrightarrow{+U_{MX}} (M)^+ + (X)^-_{gaseous\ ions}$$

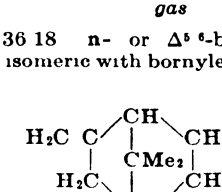
$$-Q_{MX} \uparrow \qquad \downarrow -I_M + E_X$$

$$[M] + \tfrac{1}{2}(X_2)_{at\ standard\ state} \xleftarrow{-S_M + \frac{1}{2}D_{X_2}} (M) + (X)_{monoatomic\ gas}$$

borneene $C_{10}H_{16}$ = 136 18 **n-** or $\Delta^{5\ 6}$-borneene A hydrocarbon isomeric with bornylene **iso-** or $\Delta^{6\ 7}$-borneéne



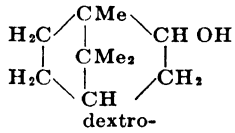
n- or $\Delta^{5\ 6}$-



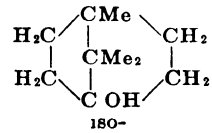
i- or $\Delta^{6\ 7}$-

borneo-camphor d-Borneol **b tallow** See *tallow*

borneol $C_{10}H_{18}O$ = 154 20 **d-** Camphyl alcohol, borneo-camphor, baras camphor, sumatras camphor, bornyl alcohol, 2-hydroxy-camphane, 2-camphanol,



dextro-



iso-

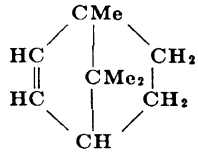
A terpene from *Dryobalanops camphora*, or prepared synthetically Transparent hexagonal leaflets, m 203, b 212, d 1 011, very slightly soluble in water, soluble in alcohol or ether **epi-** Epiborneol **iso-** 4-Hydroxycamphane Transparent crystals, d 1 011, m 210 Used in perfumery, celluloid manufacture, and medicinally, as an antiseptic and stimulant **b acetate** Bornyl acetate **b salicylate** Bornyl salicylate **b valerate** Gynoval

bornesitol Quebrachitol

bornite $FeS\ 2Cu_2S\ CuS$ Peacock copper, purple copper A native copper iron sulfide, which occurs in reddish-brown brittle, isometric crystals, d 5 0

bornyl The monovalent $—C_{10}H_{17}$ radical derived from borneol by removing the hydroxyl-group **b acetate** $MeCOOC_{10}H_{17}$ = 196 22 d-Borneol acetic ester Colorless crystals, d 0 985, m *29*, b *223*, slightly soluble in water soluble in alcohol or ether **b amine** $C_{10}H_{17}NH_2$ = 153 25 2-Aminocamphane White crystals, m 163, b 200, soluble in water, alcohol or ether **b chloride** $C_{10}H_{17}Cl$ = 172 65 Pinene hydrochloride, 2-chlorocamphane Colorless crystals, m 158, decomp by water at 49, soluble in alcohol or ether **b salicylate** $C_6H_4(OH)COOC_{10}H_{17}$ = 274 18 Salit, d-borneol salicylic ester A colorless solid, used externally mixed with equal parts of olive oil, for rheumatism

bornylene $C_{10}H_{16}$ = 136 18 $\Delta^{5\ 6}$-camphane, 1-methyl-1(4)isopropyl-$\Delta^{5\ 6}$-hexamethylene, an isomer of borneene



Colorless crystals, m 113, b 149, insoluble in water, soluble in alcohol or ether

bornyval Gynoval

borobutane See *boron hydrides*

borocaine $C_{13}H_{20}O_2N_2\ 5HBO_2$ Ethocaine borate White crystalline powder, used as antiseptic

borocalcite $CaB_4O_7\ 4H_2O$ Bechilite A native calcium borate

borofluohydric acid Borofluoric acid

borofluoric acid HBF_4 = 88 01 Hydroborofluoric acid, fluoboric, borofluohydric acid Colorless liquid, b 130, miscible with water

borofluoride Fluoboride A salt of borofluoric acid containing the monovalent $BF_4—$ radical

borofluorin A mixture of boric acid, benzoic acid, sodium fluoride and formaldehyde, used as an antiseptic and germicide

boroglyceride Glyceryl borate An antiseptic paste of boric acid and glycerin

borol Sodium and potassium borosulfate Colorless transparent masses, soluble in water Used as a disinfectant and antiseptic

borolon An artificial aluminum oxide forming white or brownish-red, crystalline masses, d 3 9–4 0, obtained by fusing bauxite and used as abrasive, refractory or filtering material

boron B = 10 82 A metal of the aluminum group, atomic number 5, and analogous to carbon It occurs in three modifications

(a) *Crystalline* b Colorless tetragonal crystals of great hardness, d 2 51, sometimes variously colored by impurities, insoluble in acids, and alkalis, and slowly soluble in molten alkali carbonates and oxides

(b) *Amorphous* b Grayish powder, d 2 45, m above 2000, b about 3500, when heated in air it burns at about 700, insoluble in water and alkalis, soluble in acids (decomp)

(c) *Adamantine* b Clear and colorless, or brown crystals having the crystal shape of diamond, a variety of crystalline boron Boron occurs widely distributed in small quantities in several silicates (tourmaline) and as borates (borax, colemanite, sassolite, ulexite), and is also found in many alkaline lakes (California, Thibet) Boron is trivalent and forms only one series of compounds

boron x-ides	BX_3
borates	$B(OM)_3$
borines	BR_3
boranes	B_xH_y

B was discovered in 1807 independently by Davy and Gay-Lussac and Thenard Crystalline b was first prepared by Woehler in 1856 Metallic b is used as a catalyst in various industrial processes

b alkyls See *borines* **b bromide** BBr_3 = 250 8 B tribromide A colorless fuming liquid, d 2 69, m −45, b 90, decomp by water or alcohol **b carbide** B_4C = 76 92 Black crystals, d 2 51, m 2350, insoluble in water or alcohol **b chloride** BCl_3 = 117 2 B trichloride A colorless liquid, d 1 434 m −107, b 18, decomp by water or alcohol **b fluoride** BF_3 = 67 82 B trifluoride A colorless gas, $d_{(air=1)}$ 2 3, m −127, b −101 **b hydrides** BH_3 = 13 84 or B_2H_4 = 27 7 Borane, boroethane A colorless gas, m −169, b −87, decomp by alcohol B_2H_6 only is known, BH_3 is analogous to CH_3 Boron forms numerous other hydrides (hydroborons), as, B_4H_{10} (borobutane), $B_{10}H_{14}$ (borodecane), analogous to the hydrocarbons and silanes **b hydroxide** Boric acid **b iodide** BI_3 = 391 8 B triiodide Colorless crystalline scales, d 3 3, m 43°C, b 210, decomp by water, soluble in chloroform or carbon disulfide **b minerals** Boron is a main constituent of several silicates, as, tourmaline and datolite It occurs in saline deposits and is obtained from

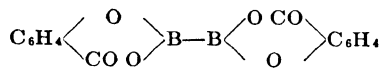
borax	$Na_2B_4O_7\ 10H_2O$
rasorite	$Na_2B_4O_7\ 4H_2O$
ulexite	$NaCaB_5O_9$ or $Na_2B_4O_7,\ Ca_2B_6O_{11}\ 16H_2O$
borocalcite	$CaB_4O_7,\ 4H_2O$
colemanite	$Ca_2B_6O_{11},\ 5H_2O$
sassolite	H_3BO_3
pinnoite	MgB_2O_4
boracite	$2Mg_3B_8O_{15},\ MgCl_2$

b nitride BN = 24 8 A colorless, infusible, crystalline powder, insoluble in acids or alkalis (decomp by hydrofluoric acid) **b oxide** B_2O_3 = 69 64 A colorless powder, d 1 83, m 577, slightly soluble in water or alcohol, readily soluble in acids **b phosphide** BP = 42 0 A red powder, which burns at 200, it is insoluble in water, alcohol, or ether **b sulfide** B_2S_3 = 117 83 B trisulfide Colorless crystals, d 1 55, m 310, decomp in water **(penta-)** B_2S_2 = 182 3 Colorless crystals, d 1 85, m 390 **b tribromide** B bromide **b trichloride** B chloride **b triethoxy-** Ethyl borate **b triethyl-** Borine **b trimethoxy-** Methyl borate **b trimethyl-** Borine **b trisulfide** B sulfide

boronatrocalcite Ulexite

borophenylic acid Phenylboric acid A mixture of phenylborate, $PhBO_2$, and phenyltriborate, PhB_3O_5 White or pinkish crystals, m 204, soluble in water, alcohol or ether Used as an antiseptic

borosalicylates A group of heterocyclic compounds of the type



borosilicate Silicoborate A salt of boric and silicic acids A silicate in which B replaces Si

borotungstic acid $(WO_3)_9B_2O_3\ 24H_2O$ A yellow liquid, d 3 0, soluble in water Used in mineralogy for determining the density of minerals

borowolframic acid Borotungstic acid

borphenyl Triphenyl borine

Borrel grinder A device for grinding organic tissues and bacteria by means of flexible steel leaves which rotate at a high speed in a steel cylinder

borsal, borsyl Sodium borosilicate

bort Anthracite diamond carbonado A dark lustrous diamond from Brazil, used for cutting stones and as drill-point in boring machines It is a conglomerate of minute crystals

boryl (1) The monovalent radical —BO (2) Ethyl-borosalicylate A white powder, used as an antiseptic and antirheumatic

Bosch, Karl 1874– A German industrial chemist noted as an inventor

boss Clamp-holder

boswellic acid $C_{32}H_{52}O_4$ = 500 5 An acid constituent of African olibanum, the resinous exudate of *Boswellia papyrifera*, a Burseraceae

botany (1) The science of the structure, function, occurrence, and classification of plants and vegetable organisms See also *biology* (2) Waste jute cuttings used for paper manufacture, cf *hessian*

Botany Bay gum Acaroid resin

botryolite Datolite

Böttcher chamber A counting apparatus for blood corpuscles and bacteria which consists of a microscope slide with ruled squares and a mounted cover glass

Böttger test A test for glucose in urine in which a black precipitate is given with sodium carbonate and bismuth subnitrate

bottle A vessel with a narrow neck used for holding liquids **aspirator-** See *aspirator* **balsam-** A small wide-necked b with a loosely-fitting glass cover **density-** See specific gravity *b* **dropping-** A b containing a pipette fitted into its cork or rubber stopper **gas-** A b used for generating or washing gases, which usually has a two-hole stopper through which the inlet and outlet tubing pass **graduated-** A graduated b used for mixing liquids **hard rubber-** One made of rubber and used for certain acids **immersion oil-** B 's of various shapes with a glass rod attached to the stopper **milk testing-** Babcock b **oil sample-** A long narrow b **paraffin-** A b made of paraffin and used for holding hydrofluoric acid **percolator-** A wide-mouth b , graduated in cc , pints or ounces **reagent-** A glass b with the name and symbol of a reagent burnt or etched on **specific gravity-** A small, light, accurately-counterpoised and graduated b used to determine the specific gravity of liquids **specimen-** A wide-mouth b used with a closure for holding specimens of various kinds **washing-** A glass b fitted with an inlet and outlet tube The latter only reaches to the bottom and is connected at the other end with a small jet Used for washing precipitates with distilled water, alcohol or other fluids, or as a bubbler for purifying or washing gases **weighing-** A small, light, glass-stoppered container, used for weighing liquids or solids on the analytical balance **Woulff-** A glass b with two or three necks, used as a washing or gas-generating bottle

b brush A length of stiff woven, galvanised wire, to the end portion and tip of which bristles are attached

bottlenose oil An inferior sperm oil from the blubber of the bottlenose whale, used in soap making

botulin A ptomaine produced by bacteria (*Bacillus botulinus*) and sometimes found in tinned and preserved meats

Bouchardat, Alexander 1806–1886 A French pharmacist noted methods of urine analysis **B reagent** A solution of 1 pt iodine and 2 pts potassium iodide in 20 pts water It gives a brown precipitate with alkaloids

bougie (1) A filter cylinder made of porous porcelain *E g* , Berkefeld, Pukal, Pasteur-Chamberland (2) A taper-shaped pharmaceutical preparation for introduction into the rectum or urethra, etc (3) A narrow tube for introduction into the urethra or other body orifice **b unit** The French photometric standard, $\frac{1}{20}$th part of the light emitted by 1 sq cm of platinum at its solidifying point

bouillon A meat broth, used as food or culture medium **glycerin-** Koch's culture medium, made from 10 gm Liebig meat extract, 10 gm peptone, 20 cc glycerin, 1000 cc water and sufficient sodium carbonate solution to make it alkaline to litmus Cf *glucose b* **plain-** A culture medium consisting of 10 gm peptone, 5 gm sodium chloride and 1000 cc bouillon stock solution, neutralized with sodium hydroxide

b stock A solution of 500 gm lean beef or 3 gm beef extract in 1000 cc water, used for making culture media

Bouin's fluid A preservative for embryological and histological material, consisting of 75 cc saturated picric acid, 25 cc 40 % formaldehyde and 5 cc glacial acetic acid

boulangerite $Pb_3Sb_2S_9$ A native lead sulfantimonate, $3PbS\ 2Sb_2S_3$, found as steel-gray or bluish-gray needles or feathery masses, d 6 18 Cf *emboulangerite*

bourbonal $C_9H_{10}O_3$ = 166 07 Ethyl vanillin, 3-ethoxy-4-hydroxybenzaldehyde, $CHO\ C_6H_3$-

(OH)OEt. A synthetic substitute for vanillin, claimed to be four times as strong in flavor.

bournonite. $CuPbSbS_3$. A native copper lead sulfantimonite, found as a bluish-gray, brittle metallic mineral.

boussingaultite. $(NH_4)_2Mg(SO_4)_2.6H_2O$. A native ammonium magnesium sulfate, found in the lagoons of Tuscany.

Bouveault-Blanc reaction. The reduction of esters to alcohols by means of metallic sodium.

B.O.V. Brown oil of vitriol. Commercial sulphuric acid containing 77–78 % H_2SO_4 by weight.

Bowen tube. Bowen potash bulb. A tube with bulbs for the absorption of gases.

bowenite. Serpentine.

Boyce burner. An adjustable burner for gas, which regulates the gas and air flows.

Robert Boyle.

Boyle, The Hon. Robert. 1627–1691. An English physicist and chemist, and pioneer in the investigation of gas laws. **B.'s law.** If the temperature is constant, the pressure of a given quantity of a gas is inversely proportional to the volume it occupies. $PV = k$, or $pv = p'v'$.

B.P. Abbreviation for (1) the beri-beri-preventing factor of vitamin B; (2) boiling point; (3) British Pharmacopoeia, B.Ph.

b.p. Abbreviation for boiling point.

B.Ph. Abbreviation for British Pharmacopoeia.

Br. The symbol for bromine. Br_2 = bromine molecule, Br^- = bromide ion. Br^* = excited bromine atom.

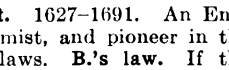
brachydome. See *dome*.

Bragg, Sir William Henry. 1862–1942. A British chemist, noted for his research on crystal structure. **B. crystallogram.** The photographic record obtained by B's. method. **B. crystal model.** The crystalline structure as determined by the diffraction of monochromatic x-rays. **B. method.** If a crystal is placed in the path of a narrow x-ray beam, the layers of atoms in the crystal act as reflection planes for the incident ray and on the photographic plate a series of lines, corresponding with the several orders of spectrum, will be produced. The following relation exists: $\lambda = 2d \sin \theta$, where θ is the glancing angle, d the spacings between atomic planes, and λ the wavelength. Compare also *x-ray spectrograph, crystal structure, Laue pattern*. See figure.

brain. The nerve tissues within the skull which consist, chemically, of: (1) white brain substance (kephalins, lecithins, paramyelins, myelins, cholesterol, phrenosterol, cerebrin and cerebrosides). (2) Buttery substance (kephaloidin, lecithin, myelin, paramyelin, aminomyelin, sphingomyelin, phrenosin and amino-lipins). (3) Aqueous brain extract, containing alkaloids (hypoxanthine, etc.), aminoacids, inosite, organic and inorganic acids and salts. **b. sugar.** Cerebrose.

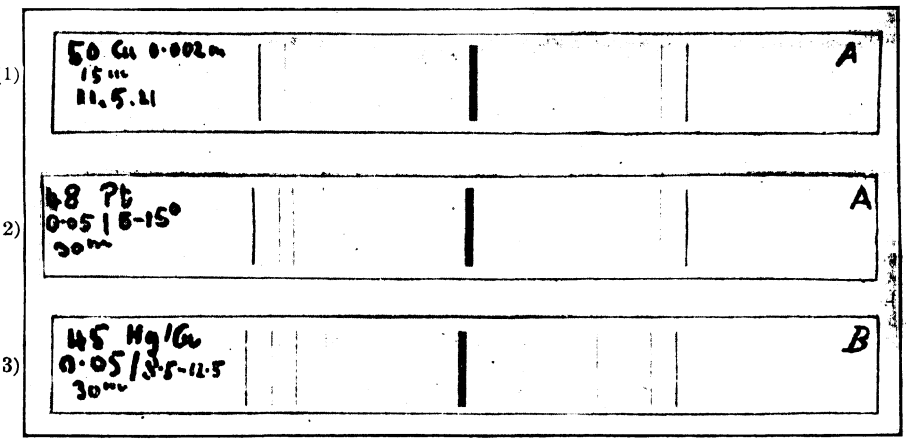
bran. The husk or outer covering of the grain of wheat. **b. oil.** Furfural.

branched chain. A forked atomic chain; as,



See also *chain*.

brand. A term, design or trade mark.



crystallogram using a rock salt crystal and apparatus manufactured by Adam Hilger, Ltd., London

(1) Kα and Kβ of copper, 15 min. exposure.

(2) L series of platinum, 30 min. exposure.

(3) Kα and Kβ of copper and Lα, Lβ of mercury, 30 min. exposure.

Brand, Hennig A merchant and alchemist of Hamburg, who discovered the first non-metallic element (phosphorus) in 1669

Brandt, Georg 1694–1768 A Swedish mineralogist, who discovered the first metallic element, cobalt, in 1735

brandy An alcoholic beverage distilled from wine Cf *cognac*

brasan Brazan

brassidic acid $C_{22}H_{42}O_2$ = 338 45 *12*-Docosenoic acid*, iso-erucic acid The unsaturated open-chain acid $Me(CH_2)_7CH{:}CH(CH_2)_{11}COOH$ Colorless leaflets, d 0 859, m 65 b $_{30mm}$ 282, slightly soluble in water, or alcohol, soluble in ether It is an isomer of erucic acid and cetoleic acid Cf *brassilic* and *brassidic* acids

brassil Pyrite

brassylic acid $C_{13}H_{24}O_4$ = 244 19 1 11-Hendecanedicarboxylic acid, $HOOC(CH_2)_{11}COOH$ Colorless crystals, m 114 slightly soluble in water Compare *brassidic*, *brassilic* and *brazilic acids*

brattice A heavily-tarred canvas used in mines for partitions and ventilation

Braun tube A potash bulb

Brauner, Bohuslav 1855–1935 A Czechoslovakian chemist, noted for inorganic research and atomic weight determinations

braunite A native manganese silicate, $MnSiO_3$ - $3Mn_2O_3$, which occurs in brownish-black or gray lustrous, tetragonal crystals

bravaisite Glauconite

Bray, William Crowell 1879– An American chemist, noted for research in catalysis, qualitative analysis and chemical kinetics

Brayera. A genus of Rosaceae See *brayerin*, *kousso*

brayerin $C_{31}H_{38}O_{10}$ = 570 3 A bitter, resinous principle from *Brayera* species

brazan $C_{16}H_{10}O$ = 218 2 Brasan, phenylenaphthylene oxide The heterocyclic compound C_6H_4 $C_{10}H_6$

braze To solder with an alloy of Cu and Zn Cf *solder*

Brazil B gum Angico gum **B nut** The edible seeds of *Bertholletia excelsa*, a Myrtaceae **b nut oil** Castanhao oil **b wax** Carnauba wax **b wood** See *brazilwood*

brazilein $C_{16}H_{12}O_5$ = 284 1 Dark-red crystals obtained by oxidation of brazilin, it resembles hematoxylin

brazilic acid Brasilic acid

brazilin $C_{16}H_{14}O_5\ 1\frac{1}{2}H_2O$ = 313 21 Brasilin The coloring matter of brazilwood Colorless or yellow needles, m 250, soluble in water, alcohol, or ether Used as a dye and indicator (acids—yellow, alkalis—purple to red) especially for the titration of alkaloids

brazilite Baddeleyite

brazilwood (1) The heart wood of *Peltophorum dubium*, a Leguminosae of South America Used for the preparation of brazilin and as an indicator (2) A red wood of *Caesalpinia* species of South America **yellow-** Morus tinctoria

brazing Brazeing

bread The staple food-product produced from the baking of flour

bregenin $C_{40}H_{87}O_5N$ = 661 71 A phosphatide from brain substance

breithauptite NiSb A native nickel antimonide

Bremen blue Blue *copper carbonate* **B green.** Green *copper carbonate*

brenzcain $C_6H_4(OMe)OCH_2Ph$ = 214 11 Brenzcatechin methyl benzyl ether, guaiacol benzylic ether Colorless crystals, m 62, insoluble in water, soluble in alcohol or ether Used as a local anesthetic

brenzcatechin Catechol **b dimethylether** Veratrol **b methyl benzyl ether** Brenzcain

Breuer hemacytometer Device for counting red blood corpuscles

breunnerite $MgFe(CO_3)$ A native mixture of siderite and magnesite

brevium Bv = 234 The radioactive element uranium X_2, atomic number 91 It is an isotope of ekatantalum (q v) and has a half-period of 1 65 minutes, hence the name, proposed by Fajans

brewing The process by which malted grain is treated with hot water to produce an extract (wort) This is boiled with hops, filtered and fermented with yeast

Brewster's law The polarizing angle, p, can be determined by the relation *tan* p = n (sin p)/ (*cos* p), where n is the refractive index

brewsterite A rock-forming mineral of the zeolite group

brick A baked clay molded in various, generally rectangular, shapes **fire-** A b used for furnace linings **silica-** A b used as lining for high-temperature appliances **sil-o-cel-** A b used for insulation

bridge (1) Any connecting atom or atoms within a ring of atoms Cf *ring structure* (2) A connecting device, as, *Carey-Foster b*, *Kelvin b*, *Wheatstone b*

brightening A term used in the dye industry The dyed material is subjected to 5 pounds steam pressure, which brightens the color

brightness The intensity of light or color (q v), hence, the amount of light emitted or reflected by an object Surface brightness is measured in *lamberts* **absolute-, apparent-,** and **photographic-** See *spectral* classification

brilliance Brightness

brilliant Intensely bright **b cresyl blue** A dye used as a stain for blood **b crocein** An aniline dye the sodium salt of aminoazobenzene-azo-β-naphtholdisulfonic acid A light-brown powder, soluble in water with deep-red color **b green** A dye used as indicator, changing at pH 2 0 from yellow (acid) to green (alkaline) **b yellow** A dye used as indicator, changing at pH 0 5 from blue (acid) to yellow, and at pH 8 0 from yellow to scarlet (alkaline)

brimstone Sulfur

Brin process The preparation of oxygen gas by heating barium oxide which, at 500°, forms barium peroxide The latter then gives off oxygen at about 1000°C

brine Water which is nearly saturated with salts, *e g* , sodium chloride

Brinell Johan August 1849–1925 A Swedish engineer **B hardness** The hardness of a substance as determined by the Brinell method, which compares the area of indentation produced by a hardened steel ball (10 mm diameter) under a pressure of 3000 Kg or 500 Kg B $= P/\pi tD$, where P is the pressure (in kg), t the depth of indentation (in mm), and D is the diameter of ball (in mm) **B tester** A device for determining the B hardness

Brinton Reishauer bottle A specific gravity bottle which holds 100 cc of liquid

briquet pl *briquettes* A brick of compressed solid fuel, as, coal, coke, lignite, sawdust or waste materials

brisance The violence or shattering effect of an explosive, measured in terms of its detonation velocity

bristles The stiff hairs of various mammals (as, hog), used for brushes

britannia metal A hard silver-white alloy of 80–90 pts tin, 10–20 pts antimony, and small quantities of copper, and sometimes lead, bismuth or zinc It can be spun, and is used in household utensils as it takes a high polish

British Chemical Societies (1) Chemical Society Organized 1841 Publishers of *Journal and Proceedings* Secretary Burlington House, London W 1 (2) Society of Chemical Industry Organized in 1881 Publishers of a weekly *Journal* and monthly *Transactions* Secretary 56, Victoria St , London, S W 1 These two societies also publish Annual Reports on the Progress in Pure and Applied Chemistry, respectively, and jointly, The Bureau of Chemical and Physiological Abstracts

British gum Dextrin

British Thermal Unit B t u (American usage) B Th U (English usage) (Cf Board of Trade Unit, B T U) A measure of energy in the English system, which corresponds with the calories of the metric system The heat required to raise one pound of water from 39°F to 40°F, hence, the heat required to raise the temperature of one pound water at its temperature of maximum density by one degree Fahrenheit This amount of heat varies with the temperatures **mean-** The $\frac{1}{180}$ part of the heat required to raise the temperature of one pound water from 32° to 212°F

1 B Th U (mean) = 252 calories = 1054 8 joule
1 B Th U per lb = 1 8 cals per gm

britholith $(Na_2Ca_7Ce_{11})(F\ OH)_4[(SiO_4)_9(PO_4)_3]$ A cerium silicate apatite

brittle (1) Easily broken or pulverized (2) In bacteriology the dry growth of bacteria, which is friable under a platinum needle **b silver ore** Stephanite

Brix hydrometer A hydrometer graduated with the Brix scale **B degree** An arbitrary scale for the direct conversion of the saccharometer reading of a sugar solution into its specific gravity, (1) x° Brix indicates that the solution to which it refers contains x gm of sugar in 100 c c (2) At 15 6°C, specific gravity = 400/(400 ± x° Brix), where x is + or − according as the liquid is heavier or lighter than water, respectively See *hydrometers*

brochantite Warringtonite A native, basic copper sulfate, $Cu_2(OH)_2SO_4$, occurring in emerald-green vitreous masses

Brodie coagulometer A device for measuring the coagulation of the blood under the microscope **B kymograph-** An apparatus for recording the undulations of living organisms, *e g* , blood pressure and arterial action **B solution** A solution of salt of such a specific gravity that a column 10 000 mm high is equivalent to a pressure of 1 atmosphere It is used in manometers

Brönner acid 2, 6-Naphthylamine sulfonic acid

bröggerite A variety of pitchblende

Broglie, Prince Louis Victor de A French physicist noted for work in wave mechanics, Nobel-prize winner **B formula** An expression connecting wave-length, λ, with momentum, *mv*, accelerated by volts, V

$$\lambda = \frac{h}{mv} = \sqrt{\frac{150}{V}}\ A$$

brom- Bromo- **b acetone** Bromoacetone

bromacetanilide See *acetanilide*

bromacetate A salt of bromacetic acid containing the monovalent $CH_2Br\ COO$—radical

bromacetic acid $C_2H_3O_2Br$ = 138 95 Bromoacetic acid, $CH_2Br\ COOH$ Colorless hexagonal crystals, m 49, b 208, soluble in water, alcohol, or ether

bromacetol *2,2*-Dibromopropane*

bromal C_2HOBr_3 = 280 9 Tribromoacetaldehyde, *2,2,2*-tribromo-ethanal*, CBr_3CHO A colorless or yellowish liquid, d 2 65, b 174, decomp in water, soluble in alcohol or ether It is used as a hypnotic and anodyne, and in organic synthesis **b hydrate** $C_2H_3O_2Br_3$ = 298 9 Tribromaldehydehydrate, *2,2,2,*-tribromo-*1,1*-ethanediol*, $CBr_3\ CH(OH)_2$ Colorless crystals, m 53, soluble in water, alcohol, or ether, and used as a hypnotic, antispasmodic and sedative

bromalin $C_8H_{17}N_4Br$ = 249 2 Bromethylformin, hexamethylenetetramine bromethylene, $C_6H_{12}N_4\ C_2H_5Br$ Colorless crystals, m 200, soluble in water, alcohol or ether, and used medicinally as an antiepileptic and sedative

bromalonic acid See *malonic acid*

bromamide Aniline tribromide

bromaniline See *aniline*

bromargyrite Bromyrite

bromate A salt of bromic acid containing the monovalent —BrO_3 radical, as sodium bromate, $NaBrO_3$

brominated Brominated (1) Combined with or containing bromine (2) The introduction of bromine into a molecule **di-** A molecule containing two atoms of bromine **mono-** A molecule containing one atom of bromine **b camphor** See *camphor*

bromation Bromination

bromatology The science of food and diet

bromaurate A salt, $MAuBr_4$, derived from auric bromide and a metallic bromide, MBr

brombenzamide See *benzamide*

brombenzene See *benzene*

bromcamphor See *camphor, monobromated*

bromchlorphenol blue $C_{19}H_{10}Br_2Cl_2O_5S$ = 580 6 Dibromo dichloro sulfon phthalein A yellow powder, soluble in water or alcohol It is an indicator, changing from yellow (pH 4 5) to blue (pH 5 5)

bromcresol green $C_{21}H_{14}Br_4O_5S$ = 700 0 *3 3-6 7*-Tetrabromo-*m*-cresol sulfone phthalein A gray powder, soluble in water and alcohol Used as pH-indicator between 4 5 (yellow) and 5 5 (blue) **b.c purple** $C_{21}H_{16}Br_2C_5S$ = 540 41 Dibromo-*o*-cresol sulfon phthalein A light yellow powder, used as pH-indicator between pH 5 2 (yellow) and 6 8 (purple)

bromelia $C_{12}H_{12}O$ = 172 1 Ethoxynaphthalene, β-naphthyl-ethyl ether, $C_{10}H_7OEt$ Colorless crystals, d 1 064, m 37 5, b 282, insoluble in water, soluble in alcohol or ether Used in perfumery

Bromeliaceae The pineapple family, an order of tropical plants with rigid, spiny leaves

bromelin A proteolytic enzyme occurring in pineapples, which changes proteins to proteoses and peptones

bromeosin See *eosin*

bromethane Misnomer for (1) bromomethane, (2) bromoethane

bromethyl (1) Ethyl bromide (2) Bromomethyl (3) Bromoethyl

bromethylene Ethylene bromide

bromethylformin Bromalin

brometone $C_4H_7OBr_3$ = 310 9 Acetone bromoform, 1 1 1 tribrom-2-methylpropan-2-ol, tribromo-tertiary-butanol, *2 2 2*-tribromo-*1*-methyl-*1*-propanol*, $CBr_3C(Me_2OH$ Fine, white prismatic crystals with camphor-like odor and taste, m 167, slightly soluble in water, soluble in alcohol ether, or benzene, used medicinally as a sedative

bromhydrin An organic compound of the type Br—R—OH Cf *halohydrin, chlorhydrin* **tri-** Allyl tribromide

bromic acid $HBrO_3$ = 128 97 Colorless crystals, decomp about 100, slightly soluble in water Its salts are the bromates **hydro-** See *hydrobromic acid* **b ether** Ethyl bromide

bromide A binary salt containing negative monovalent bromine, *e g*, sodium bromide, NaBr The bromides are usually soluble in water **hydro-** An addition compound of HBr and an organic base, as an alkaloid

brominated Bromated

bromination (1) To treat with bromine (2) To introduce Br into an organic molecule Cf *bromation bromization*

bromine Br = 79 916 An element of the chlorine group, atomic number 35 A dark-brown, liquid, fuming halogen d_0° 3 19, m −7 5, b 58 78, soluble in water, alcohol, chloroform or ether Gaseous bromine has a density of 5 524 (air = 1) and molecular weight (Br_2) 159 84 Elementary bromine never occurs native, and is found mainly as the bromides of alkali metals, in natural waters, brines and sea water Solid ores are carnallite and silver bromide Bromine is mainly monovalent, but in some compounds it is tri- penta- and heptavalent and forms several series of compounds

−1 bromides	Br^-
+1 hypobromites	BrO^-
+3 bromites	BrO_2^-
+5 bromates	BrO_3^-
+7 perbromates	BrO_4^-

Bromine was discovered in 1826 by Balard in the mother liquors of sea water, and named from the Greek 'bromos" meaning stench Liquid bromine is used as a reagent and oxidizing agent, in organic synthesis, and as poison gas **b chloride** $BrCl\ 10H_2O$ = 295 6 B monochloride Yellow crystals or liquid, m 7, decomp readily, very soluble in water, carbon disulfide or ether **b cyanide** Cyanogen bromide BrCN = 106 01 Colorless needles, m 52, b 61 5, soluble in water or alcohol **b fluoride** BrF = 98 92 Colorless prisms, m 50, b 132, decomp by water **b hydrate** $Br\ 10H_2O$ = 260 01 Red octahedric crystals, decomp 15, soluble in water **b hydride** Hydrobromic acid **b iodide** BrI = 206 84 B monoiodide Colorless crystals, m 36, soluble in carbon disulfide or chloroform **b monochloride** B chloride **b monoiodide** B iodide **b pentachloride** $BrCl_5$ = 257 21 A colorless liquid, used in organic synthesis **b sulfide** Br_2S_2 = 223 96 A red liquid, d 2 629 b 195, decomp by water **b water** A saturated aqueous solution of bromine containing about 3 % Br, used as reagent instead of bromine

brominol A brominized (33 % Br) olive oil, used as an x-ray contrast medium

bromipin 10 % brominated sesame oil A yellow oily liquid used medicinally as a sedative nervine and antiepileptic 33 % b is used as an x-ray contrast medium

bromite Bromyrite

bromization Bromation To saturate with bromine Cf *bromination*

bromlite Alstonite

brommalonic acid $C_3H_3O_4Br$ = 183 01 The bibasic acid $CHBr(COOH)_2$ Colorless needles, soluble in water alcohol or ether

bromnaphthalene See *naphthalene*

bromo- Brom- A prefix which indicates the presence of a bromine atom in an organic compound **di-** A compound containing two bromine atoms **tri-** A compound containing three Br atoms

bromoacetic acid See *bromacetic acid*

bromoacetone $BrCH_2COMe$ = 136 95 Monobromomethyl ketone A colorless liquid, d 1 603, m −54, b 127, used in chemical warfare as a poison gas

bromobenzamide See *benzamide*

bromobenzene See *benzene*

bromobenzylcyanide $BrC_6H_4CH_2CN$ = 195 97 o-bromo-phenyl-aceto-nitrile, *2*-bromo-7-cyano-toluene A colorless liquid, d 1 519, m 25 5, b 242 (decomp), used in chemical warfare as a lacrimatory poison gas (B B C)

bromocaffeine $C_8H_9O_2N_4Br$ = 272 1 A white powder, m 206, slightly soluble in water, soluble in alcohol, ether, or chloroform

bromocamphor Camphor, monobromated

bromocyanogen Cyanogen bromide

bromoethyl (1) Ethyl bromide (2) The radical $BrCH_2CH_2$—

bromoform $CHBr_3$ = 252 90 Tribromomethane*, formyl bromide, methenyl bromide A colorless liquid, d 2 904, m 7 7, b 150 4, slightly soluble in water, miscible with alcohol or ether Used for the separation of minerals, and as local

anesthetic, antispasmodic and sedative **nitro-** CBr_3NO_2 = 297 78 Bromopicrin, tribromonitromethane* Colorless liquid, $d_{12°}$ 2 811, m 10, b_{118mm} 127, insoluble in water, soluble in alcohol or ether

bromoformin Bromalin

bromoketone $BrCH_2COEt$ = 150 98 Bromomethyl ethyl-ketone, used in chemical warfare

bromol Tribromphenol

bromomethane Methyl bromide **tri-** Bromoform

bromomethyl (1) Methyl bromide (2) The radical $BrCH_2$—

bromometry The determination of the halogen-absorbing capacity of unsaturated compounds or of materials containing them, *e g* , fats Results are usually expressed in terms of iodine

bromonaphthalene See *naphthalene*

bromophenol See *bromphenols* **b blue** See *bromphenols*

bromophosgene Carbonyl bromide

bromopicrin Nitro-bromoform

bromoprene C_4H_5Br = 134 0 *2*-Bromobutadiene-1 4, CH_2 CBr CH CH_2 An intermediate in the polymerization of synthetic rubber Cf *isoprene, duprene*

bromopyrine $C_{11}H_{11}ON_2Br$ = 267 0 Monobromantipyrine White crystals, m 114, soluble in hot water or alcohol, used medicinally as an antipyretic and antiseptic

bromothymol blue See *indicators*

bromotoluene See *toluene*

bromphenols Br C_6H_4OH = 173 0 A series of compounds, formed by the action of bromine on phenol **o-** A liquid b 194, sparingly soluble in water **m-** A solid, m 32, b 236 **p-** A solid, m 63, b 235 Sparingly soluble in water **tri-** $C_6H_3OBr_3$ = 330 9 The solid, 1 2 4 6-C_6H_2-OH Br_3, m 96 Sparingly soluble in water **b blue** $C_{19}H_{10}Br_4O_5S$ = 673 75 *2 3 6 7*-Tetrabromophenol sulfon-phthalein A yellow powder, soluble in water or alcohol, used as pH-indicator from pH 3 0 (yellow) to 4 6 (blue) **b red** $C_{19}H_{12}Br_2O_5S$ = 511 9 Dibromophenol-sulfon-phthalein A yellow powder, used as pH-indicator from 6 0 (yellow) to 7 0 (red)

bromphenyl acetylcystein Phenylmercapturic acid

bromthymol b blue $C_{27}H_{28}Br_2O_5S$ = 624 Dibromo thymol sulfon phthalein Dark brown crystals with green luster used as pH-indicator from pH 6 0 (yellow) to 7 6 (blue)

bromum The official Latin for bromine

bromural $MeCHMe(CHBrCO)NH\ CONH_2$ = 223 03 2-Monobromoisovaleryl urea Small colorless needles, m 145, soluble in water, alcohol or ether Used medicinally as a nerve sedative and hypnotic

Bromwell apparatus A graduated glass cylinder of special shape for fusel oil determination (U S Dept Agric , Bureau of Chem , Bull 107)

bromyrite AgBr Bromargyrite, bromite An unctuous native silver bromide found as yellow or greenish, transparent or opaque isometric crystals

brongniardite $Ag_2PbSb_2S_5$ A native silver-lead-sulfoantimonite, which occurs in isometric crystals

Bronner acid *2* 6-Naphthyl-amine-sulfonic acid

bronze A copper-base alloy containing elements other than zinc in amounts sufficient to predominate over the zinc present, *e g* ,

90 % Cu 10 % Sn, gun metal	m 1005°C
80 % Cu 20 % Sn, bell metal	m 890°C
70 % Cu 30 % Sn, speculum	m 755°C

acid- An alloy containing 82–88 % Cu 2–8 % Pb, 8–10 % Sn and 0–2 % Zn **aluminum-** An alloy of 90 % Cu and 10 % Al **carbon-** An alloy used for bearings **manganese-** An alloy of 88 % Cu, 10 % Sn and 2 % Mn **phosphor-** See *phosphor* **saffron-** Orange *tungsten* **silicon-** A non-corrosive bronze containing Si **Sillmann-** An alloy of 86 % Cu, 10 % Al and 4 % Fe **Tobin-** An alloy of 55 % Cu, 43 % Zn and 2 % Sn **tungsten-** Tungsten bronze **b blue** Prussian blue

bronzite Schillerspar A rhombic native pyroxene consisting of $MgSiO_3$ with 10 % $FeSiO_3$, it has a sub-metallic bronze-like lustre

brookite Arkansite An orthorhombic variety of rutile, d 4 0, hardness 6–6 5, reddish-brown to black color

broom Scoparius **Spanish-** Spartium **b corn-** Sorghum

brown A pigment or color made by mixing red, yellow and black **b coal** Lignite **b dyes,** See *aniline* b , *bismarck* b , *resorcin* b , *spirit* b **b hematite** See *hematite* **b iron ore** See *limonite, bog iron ore, ocher, b hematite* A hydrous iron oxide with some iron carbonate **b ocher** B iron ore **b pigments** See *cadmium b* , *Cassel b* , *chrome b* , ocher, sepia, vandyke b , zinc b **b oil of vitriol** B O V **b spar** Pearl spar A variety of dolomite (q v) with a brown tinge due to Fe_2O_3 or Mn_2O_3

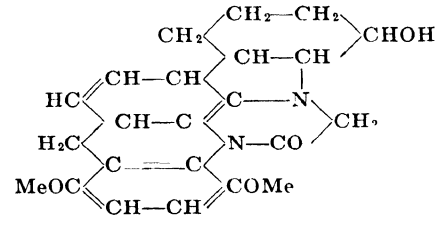
Brown, Alexander Crum 1869–1908 A Scottish chemist noted for organic research **Crum B rule** If the hydrogen of an aromatic compound can be converted by direct oxidation into a hydroxyl compound, substitution will take place in the meta-position If not the substituting radical enters the ortho or para position **B , Robert,** 1773–1858 An English botanist noted as the discoverer of the Brownian movement

Brownian movement Pedesis The rapid vibratory motion of extremely small particles suspended in a liquid, caused by the bombardment of the particle by the moving molecules of the liquid The velocity varies inversely with the size of the particles, and depends also upon the viscosity of the medium Cf *Svedberg's equation*

Brownite cupel A shallow vessel used in silver analysis

brownmillerite $4CaO\ Al_2O_3\ Fe_2O_3$ A phase in the stabilisation of dolomite by calcination with silica

brucine $C_{23}H_{26}O_4N_2 4H_2O$ = 466 41 Dimethoxystrychnine



An alkaloid from the seeds of *Strychnos* species (nux vomica, ignatia, etc) Colorless crystals, m 178, slightly soluble in water, soluble in alcohol or ether Used medicinally as a nerve tonic **b hydrobromide** $C_{23}H_{26}O_4N_2 HBr$ =

479 31 White crystals, soluble in water or alcohol, and used as brucine **b hydrochloride** $C_{23}H_{26}O_4N_2$ HCl = 430 81 White crystals, soluble in water or alcohol, used as a tonic **b nitrate** $C_{23}H_{26}O_4N_2$ HNO_3 $2H_2O$ = 493 39 White crystals, decomp 230, soluble in alcohol, water or ether **b phosphate** $(C_{23}H_{26}O_4N_2)_2$ - H_3PO_4 = 886 78 A white crystalline powder, soluble in water or alcohol **b sulfate** $(C_{23}H_{26}O_4N_2)_2$ H_2SO_4 $7H_2O$ = 1012 86 Colorless needles, soluble in water or alcohol **b test** A solution of 0 5 gm in 200 cc of concentrated sulfuric acid is used as a test for nitric acid

brucite $Mg(OH)_2$ Nemalite A native magnesium hydroxide

Bruehl receiver Receivers for a condenser in an air-tight container, in which a number of distillates may be collected separately by turning the apparatus around so that the individual receivers come under the end of the condenser The condenser passes in through an air-tight joint, so that vacuum distillation may be used

Brunck, Heinrick von 1847–1911 A German chemist, noted for the development of the organic chemical industry

brunfelsia Manaca

Brünner acid 2,6-Naphthylamine sulphonic acid

brunswick green Green *copper carbonate*

brushite $CaHPO_4$ $2H_2O$ A native acid calcium phosphate

bryoidin $C_{20}H_{32}O_3$ = 326 30 A bitter principle of elemi gum

bryonane $C_{70}H_{42}$ = 282 3 A saturated hydrocarbon, m 69, b 400, from the leaves of *Bryonia dioica*, a Cucurbitaceae It is possibly identical with laurane

bryonia English mandrake, white bryony The dried roots of *Bryonia* species (Cucurbitaceae) containing bryonin, alkaloids, and resin, used as cathartic **black-** Blackeye root The root of *Tamus communis*, a Dioscoraceae, used as rubefacient and diuretic **white-** Bryonia

bryonin $C_{48}H_{80}O_{19}$(?) A glucoside from the root of *Bryonia* species, Cucurbitaceae An amorphous yellowish-brown powder, soluble in water or alcohol, used medicinally as a cathartic

Bryophyta A division of Cryptogamia, including liverworts (Hepatica) and mosses (Musci)

B S See *Bureau of Standards*

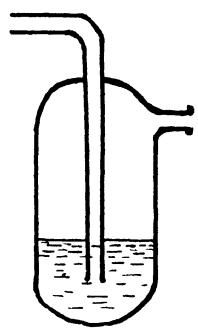
B S I British Standards Institution An organization which issues specifications and methods of testing materials Cf *A S T M*

B t u, B Th U British thermal unit

Bu The symbol for butyl **i-Bu** The symbol for isobutyl **BuOH** Butyl alcohol

bu Abbreviation for bushel

bubble (1) A small air droplet (2) To pass gas through a liquid **b counter** A device to measure the volume of a gas evolved during a reaction It consists of a capillary tube through which the gas bubbles escape, connected with a U-tube partly filled with Hg, each b makes an electric contact **b gage** A small glass instrument used as an indicator of gas flow (figure)

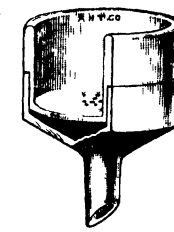


Bubble gage

bubulin A compound of cow's dung

bucco Buchu

Buchner, Eduard 1860–1917 A German chemist and Nobel prize winner (1907), who found that enzyme action is purely chemical **B funnel** A shaped porcelain funnel containing a perforated porcelain plate, on which the filter-paper is placed **B number** The number of cc of normal alcoholic potash solution required to neutralize 2 5 grams of wax dissolved in 80 % alcohol



Buchner funnel

b ucholzite A variety of fibrolite

buchu Bucco, bucku The dried leaves of *Barosma betulina*, a Rutaceae of South Africa It is a diuretic, anticatarrhal, used as fluid extract Cf *rutin, barosmin* **b camphor** See *diosphenol*

Buck iron mortar A specially shaped mortar for grinding gold ore with mercury

buckbean Menyanthes

buckthorn Rhamnus **b bark** Frangula **b berries** Rhamnus cathartica The dried ripe fruit of *Rhamnus cathartica* (Rhamnaceae) It is a cathartic, used as fluid extract Cf *xanthorhamnin*

buckwheat The seeds of *Fagopyrum esculentum*, a Polygonaceae, used as food

Bucky rays Grenz rays

Budde effect The expansion in volume of chlorine or bromine vapor when exposed to light

buddeized Sterilized by adding hydrogen peroxide and followed by slight warming, as, milk

budding A form of cell-division in which the new cell is an outgrowth of the parent cell, from which it becomes detached after it has grown to a certain size, as, yeast

buddling The process of crushing an ore and washing it in a stream of water

budiene Bivinyl

Bueb process A method for making ferrous ferrocyanide from iron sulfate, ammonia and hydrocyanic acid

bufagin $C_{24}H_{32}O_5$ = 380 3 A neutral, digitalis-like principle in the skin-gland venom of the toad, *Bufo agua* It is used by Brazilian natives as a constituent of arrow-poison Cf *sterols*

buffer Any substance which, when added to a solution, resists any change in hydrogen ion concentration on addition of acid or alkali **oxidation-reduction-** A mixture of compounds which resists a change in oxidation-reduction potential and so enables selective oxidation and reduction to be carried out Cf *redox* **b action** The capacity to neutralize, within limits, either acids or bases, without changing the original acidity or alkalinity, as, of blood soil, plant juices **b capacity** The millimoles of H^+ which a unit volume of the solution in question will neutralize when an excess of standard acid is added **b index** B value **b salt** Salts which behave as buffers generally those of acids with a low dissociation, *e g* the carbonates and phosphates of the blood which maintain a pH of 7 35, notwithstanding the absorption of CO_2 or the introduction of acids **b solution** Any solution of a weak acid or base and its salts, such as acetates, borates, phosphates, phthalates, which behave as buffers The following is a "universal" b solution from pH 2 5 to pH 11 5 (Prideaux and

Ward, Trans. Chem. Soc., 125, 1924, p. 426). A 0.1 N solution is made containing phosphoric, phenylacetic, and boric acids, 0.02 N to the hydrogen ion in each case. If V is the number of cc. of 0.2 N HCl and 0.2 N NaOH which is added to 100 cc. of this solution with subsequent dilution to 200 cc., then pH = 3.1 + 0.1185V (NaOH is +, HCl is −). **b. value.** The amount of standard solution (acid or alkali) required to bring about a specified change in the hydrogen ion concentration of a solution.

bufonin. $C_{34}H_{54}O_2$ = 494.43. A poisonous principle in the secretion of toads and lizards; *e.g.*, *Bufo vulgaris*. Cf. *phrynin*. It is slightly soluble in water or alcohol, soluble in ether, benzene or chloroform.

bufotalin. $C_{24}H_{30}O_3$ = 266.23. A split-product of bufotoxin, which resembles digitaligenin.

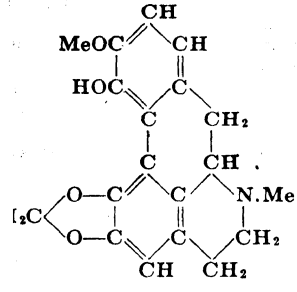
bufotanine. $C_{14}H_{18}O_2N_2$ = 246.16. An alkaloid from the secretion of the parotoid gland of *Bufo vulgaris*.

bufotoxin. $C_{34}H_{46}O_{10}$ = 614.37. A poisonous principle in the skin secretions of toads and lizards. It forms salts with alkalis, and is precipitated by barium chloride.

bugle weed. The herb of *Lycopus virginicus*, a Labiatae. It is a tonic, astringent and sedative; used as a fluid extract.

bulb. (1) A round under-ground leaf-bud or stem of a plant, consisting of a number of fleshy leaves crowded together and enclosing the base of the stem. (2) Any spherical or bulb-shaped apparatus. **connecting-** A glass tube with a round enlargement, for connecting flasks with condensers; *e.g.*, a splash-head in Kjeldahl's apparatus. **levelling-** A round glass container with two outlets, used in gas analysis. **nitrogen-** A conical flask connected with one or more spherical glass tubes; *e.g.*, Fresenius, Volhard, etc. **resistance-** Electrical contacts used with potentiometers. **rubber-** Rubber nipples for pipettes or round hollow rubber balls with valves for blowpipes, gas burettes, etc.

bulbocapnine. $C_{19}H_{19}O_4N$ = 325.16. An alkaloid from the bulbs of *Corydalis cava* (*Bulbocapnus cavus*) a Papaveraeceae. A white crystalline powder, m.199; soluble in alcohol.



b. hydrochloride. $C_{19}H_{19}O_4N.HCl$ = 361.6. White crystals, soluble in hot water.

bulgara. The *Bacillus lactis bulgaricus* found in intestinal flora; used in tablet form for increasing the production of lactic acid and preventing abnormal intestinal putrefaction. Used in intestinal toxemia, chronic constipation etc.

bulk. (1) The increase in the volume of a solvent which is due to the dissolved substance. Cf. *cut*. (2) The ratio of the thickness to the weight per unit area of a paper. It is therefore a measure of the air-space present.

bullate. A bacterial growth rising in convex prominences like a blistered surface.

bullet-proof glass. A glass made from two or more plates of glass cemented together, under pressure, by a transparent plastic material.

bullion. (1) Uncoined gold or silver in bars or other masses. (2) Metal money as distinct from paper money. (3) Any metal in bar form.

bullseye condenser. A concave lens mounted on a stand, and used for the illumination of opaque objects under the microscope; also for ultramicroscopic illumination with an artificial source of light.

bully tree. See (1) *chicle*, (2) *balata*, (3) *sapota*.

bumping. Uneven boiling of a liquid, owing to super-heating because of the absence of dirt or other particles which act as nuclei for the formation of steam bubbles. It is avoided by adding glass beads, pumice, straight or U-shaped glass tubes, or any other inert solid to the liquid.

Bumstead electroscope. A sensitive gold leaf electroscope.

buna. A German rubber substitute prepared by the polymerisation of butadiene.

Bunsen, Robert Wilhelm Eberhard von. 1811–1899. A German chemist noted for gasometric

Robert Wilhelm von Bunsen.

and photometric researches, work on the electrolytic cell, devising the bunsen burner and as a pioneer in spectrum analysis. **b. burner.** A gas burner with adjustable air supply. **B. cell.** An electrolytic element which furnishes a large current of a constant potential of 1.9 volt. It consists of an anode of amalgamated zinc in 10 % sulfuric acid and a cathode of carbon in conc. nitric acid. It is a modification of Grove's cell (q.v.). **B. clamp.** A clamp with cylindrical, rubber-covered jaws, for holding tubes, condensers, etc. **B. eudiometer.** A graduated glass tube with platinum electrodes near the closed end. On passing an electric discharge through a combustible gas mixture, the volume changes, and thence the composition may be determined. **B. flame.** See *flame*. **B. funnel.** A glass funnel with long stem at an

angle of 60° **B gas-bottle** A cylindrical glass bottle with a tubular outlet near the neck and an inlet tube passing close to the bottom It is used for washing gases **B reactions** Flame reactions The qualitative preliminary examination of substances by observing their behavior in the Bunsen flame evaporation, melting, or imparting characteristic color to the flame, and producing a metallic spot on a cold porcelain surface Cf *analysis* **B Roscoe law** Reciprocity law If in a series of exposures the products of light intensity and exposure time are equal, the amounts of darkening of a sensitive silver chloride paper will also be equal, hence, the amount of substance decomposed by radiant energy is proportional to the amount of energy absorbed **B valve** See *valve*

bunsenite, bunsenine NiO Krennerite A native nickel oxide, which occurs in greenish isometric crystals

Bunte, Hans 1848–1925 A German chemist who developed gas analysis **B gas-burette** A burette with or without a water-jacket, which has at one end a two-way stopcock

buoyancy The capacity to float in a liquid or gas **correction for-** In accurate weighing the true weight g_0 is obtained by $g_0 = g\left(1 + \frac{g_a}{d} - K\right)$ where g is the observed weight $g_a = 0.0012$, the weight of 1 cc air, d the density of the body being weighed and $K = 0.00014$, the ratio of the densities of air and brass weights

buphane Candelabra flower, Cape poison bulb, gifbol The plant, *Buphane distidia* and *B toxicaria*, an Amaryllidaceae of South Africa used as antiseptic It contains buphanine haemanthine, narcissine, etc

buphanine An alkaloid from the bulb of buphane, it is hydrolyzed to buphanitine

buphanitine $C_{23}H_{24}N_2O_6 = 424.20$ An alkaloid from buphanine, m 240

burbonal Bourbonal

Burchard-Liebermann reaction Acetic anhydride produces a blue-green color with cholesterol in chloroform on the addition of a few drops of concentrated sulfuric acid

burdock Lappa

Bureau of Standards The U S Official Institution for setting up and testing standards of quality for apparatus and chemicals

buret, burette A graduated glass tube used in volumetric analysis for measuring of definite amounts of liquids **automatic-** A buret with a device for rapidly re-filling to the zero-point, which usually is provided with an overflow cup **certified-** A buret which has been tested as to the accuracy of its calibrations **chamber-** A b in which drainage errors are minimized by means of a wide ungraduated upper chamber containing the bulk of the liquid, and terminating at the bottom in a small narrow graduated tube, with a tap, for measurement purposes **gas-** A buret used in gas-analysis, *e g*, *Bunsen b* **precision-** Certified b **Schellbach-** A b with a milk-glass scale, having a central blue line which gives the meniscus the appearance of a cusp and is supposed to minimize errors from this source

b cap A small glass cup that fits loosely over the top of a buret **b clamp** A pinch-cock attached to the rubber tubing of a buret **b float** A small floating swimmer or closed glass tube placed inside the burette, facilitating readings **b holder** A clamp for holding a buret in position **b reader** A device which is clamped on the buret, facilitating the reading of the meniscus

Burgundy mixture A substitute for Bordeaux mixture A mixture of 4 lbs of copper sulfate in 35 gallons of water, and 5 lbs of sodium carbonate in 5 gallons of water

burkeite $Na_2CO_3\ 2Na_2SO_4$ **sesqui-** $2Na_2CO_3 \cdot 3Na_2SO_4$ By-products from the co-crystallisation of sodium sulphate and carbonate in the isolation of potassium from the Trona deposits (q v)

Bürker chamber A counting chamber for hemocytometers, consisting of an accurately ruled microscope slide

burlap A coarse jute fabric, similar to sacking used in linoleum manufacture and as a wrapping

burner A device or apparatus for obtaining a flame by the combustion of solids, liquids or gases **acetylene-** A b designed for acetylene gas **acme-** A b for gas or gasoline vapor, with adjustable air and gas control **alcohol-** A b usually of the wick-type for alcohol **argand-** A b for oil or gas with an inner tube to supply air to the flame

b attachments See *crown top*, *gauze top*, *wing top*, *chimney*, *star*, *tripod* **Barthel-** A b designed to burn alcohol or benzene **blast-** A b in which compressed air is blown into the flame **blue flame-** A b for gas, giving a high temperature with or without blast attachment **Boyce-** Acme b **bunsen-** See *Bunsen* **Chaddock-** A non-corrodable b resembling a small blast furnace, made from refractory material **combustion tube-** A set of bunsen b with wing tops **Dangler-** A gasoline b **eureka-** A self-lighting gas b **evaporating-** A round cast-iron disk with holes, for obtaining a number of small flames **Fisher-** A modified Mekker burner which gives a hot flame **Fletcher-** Round hollow cast-iron rings with holes or slits, for rapidly heating large vessels **gauze top-** A bent iron tube with gauze top **Jansen-** A blast-b for glass-blowing with air and gas regulation through two different tubes **Mekker-** A bunsen b having a grid at its top, which mixes the gases and prevents "striking back" and produces a hot uniform flame **micro-** A very small gas b for microanalytical operation **multiple tube-** A gas b with three or more tubes arranged circularly or in a straight line **pilot light-** A bunsen b with a small inside tube producing a small flame which is kept burning continuously **porcelain-** Chaddock **rose-** A burner with a rose-shaped circular metal attachment perforated round its circumference, which fits on the top and enables very small flames to be obtained **Sargent-** A b for gas with adjustable air and gas supply **Scimatco-** A gas b for obtaining high temperatures **spectrum-** A b with platinum holders, for producing colored flames from solids such as salt for spectrum analysis, polariscopes or other instruments where monochromatic light is required **Teclu-** See *Teclu b*

burnettizing A process for the preservation of wood by treatment with creosote under pressure

burning See *calcination firing*

burnt Calcined, or strongly heated **b alum** Anhydrous *potassium aluminum sulfate* **b lime** Calcium oxide

burra gokero Barra gokhru The seeds of *Pedalium murex*, a Pedaliaceae of tropical

Africa and Asia, used as an antispasmodic and diuretic

Burrel apparatus An apparatus for gas analysis (U S Bureau of Mines, Bulletin 42)

Burseraceae A group of tropical trees and shrubs that secrete resinous and oily substances

Commiphora myrrha	myrrh
Bursera gummifera	chibou
Boswellia papyrifera	boswellic acid
Boswellia carterii	olibanum
Commiphora (Balsamodendron) mucul	bdellium
Canarium commune	elemi, nauli gum

bursine An alkaloid from *Capsella bursapastoris* (shepherd's purse) a Cruciferae

burtonization The addition of gypsum or other calcium salts to a water supply Used in brewing, where a water similar to that of Burton-on-Trent (England) is required

bus-bar The conducting metal rod which carries the objects to be plated or otherwise treated in electrolytic deposition plants

bushel 1 bu (British) = 0 35239 hectoliters or 35 2 liters = 8 gallons or 2219 36 ± 17 cu in **imp -** British b **U S A -** = 2150 42 cu in **Winchester-** U S A b

Busz rhombohedron A crystal model for demonstrating the double refraction of calcspar

butadiene*- Bivinyl **bromo-*** Bromoprene **chloro-*** Chloroprene **methyl-*** Isoprene **b dicarboxylic acid** Muconic acid

butadiine, butadiyne* Biacetylene

butagas Compressed butane, used for domestic lighting and heating

butalanin *α*-Amino-*i*-*valeric acid*

butaldehyde Butyraldehyde

butamin Lutocaine

butanal* Butyraldehyde

butanamide* Butyramide

butane C_4H_{10} = 58 1 Tetrane methyl ethyl methane $MeCH_2CH_2Me$ The fourth member of the aliphatic hydrocarbon series A colorless gas, d_{air} 2 046, m −35, b 1, insoluble in water, slightly soluble in alcohol It is a constituent of natural and illuminating gas **iso-** Trimethylmethane, $CHMe_3$ A colorless gas m −145, b −11, insoluble in water, soluble in alcohol or ether **bromo-*** Butyl bromide **chloro-*** Butyl chloride **dibromo-*** Butylene bromide **dihydroxy-** Butanediol* **hydroxy-** Butyl alcohol **diphenyl-** Dibenzyl ethane **iodo-*** Butyl iodide **nitro-*** $C_4H_9NO_2$ = 103 08 Butyl nitrite A colorless liquid, b 151, slightly soluble in water **phenyl-** Butyl benzene **b diamine** Putrescine **b dicarboxylic acid*** Adipic acid

butanedial* Succinaldehyde

butanediamide* Succinamide

butanediamine* Putrescine

butanediol* $C_4H_{10}O_2$ = 90 1 Butylene glycol, dihydroxybutane *α*- or **1 2-** $EtCHOH\,CH_2OH$ A colorless liquid d 1 019, b 191 *β*- or **1 3-** $MeCHOH\,CH_2CH_2OH$ A colorless liquid, d 1 0239, b 204 *γ*- or **1 4-** Tetramethylene glycol $HO(CH_2)_4OH$ A colorless liquid, d 1 020 m 16, b 230 *ψ*- or **2 3-** $Me(CHOH)_2Me$ A colorless liquid, d 1 048, b 184 **dimethyl-** Pinacol

butanedione* $C_4H_6O_2$ = 86 1 A group of diketones, **1 3-** $HCO\,CH_2\,COMe$ **2 3-** Biacetyl

butane-ol Butyl alcohol

butanoic acid Butyric acid

butanol* Butyl alcohol

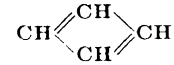
butanone* Methylethylketone **dimethyl-** Pinacoline **hydroxy-** $MeCO\,CHOH\,Me$ Acetoin An ethereal liquid formed during fermentation by yeast

butanoyl* Is Butyryl

butea gum Bengal kino The dried, red astringent juice of the dhak or pallas tree, *Butea frondosa*, a Leguminosae of India, used as an astringent It contains 20–60 % kinotannic acid

butenal* Crotonaldehyde

butene* (1) C_4H_4 = 52 04 Dimethylene, cyclo butylene The homocyclic hydrocarbon



(2) Butylene (butene*)

butenic acid $C_4H_6O_2$ = 86 046 Butenoic acid* **α-** See *crotonic* and *isocrotonic acid* **β-** Vinylacetic acid, $CH_2\,CH\,CH_2\,COOH$ A colorless liquid, d 1 007, m −39, b 163, soluble in water, alcohol or ether **iso-** methyl *acrylic acid* **α-methyl-** See *angelic* and *tiglic acid* **β-methyl-** Senecioic acid

butenoic acid* Butenic acid

butenol* C_4H_8O = 72 05 **1-** 1-buten-*1*-ol, $MeCH_2\,CH\,CHOH$ **2-** *2-buten-1*-ol CH_3-$CH\,CH\,CH_2OH$ Crotonyl alcohol **3-** *3*-buten-*1*-ol, $CH_2\,CH\,CH_2\,CH_2OH$

butenyl The monovalent radical C_4H_7—, derived from butylene There are Δ^1- $MeCH_2$-$CH\,CH$—, Δ^2- $MeCH\,CHCH_2$— and Δ^3- $CH_2\,CH(CH_2)_2$—

butesin $C_{11}H_{15}O_2N$ = 193 12 *n*-butyl-*p*-aminobenzoate $NH_2C_6H_4COOC_4H_9$ White crystals, m 57, b_{2mm} 147, insoluble in water, soluble in alcohol, used as a local anesthetic **iso-** m 65 **b picrate** A yellow powder used as an analgesic and protective It is a combination of trinitrophenol and b

butine C_4H_6 = 54 05 Butyne* An unsaturated hydrocarbon containing a triple bond, as **T1-** Ethylacetylene, $CH\,C\,CH_2Me$ A colorless liquid or crystals, m 18 **T2-** Crotonylene

Butler set A wooden case containing a set of apparatus and reagents for blowpipe analysis

butoxy The monovalent radical, $Me(CH_2)_3O$— derived from butanol

butter (1) A food prepared by churning cheese It contains not less than 80 % of milk fat, some water, vitamins, small quantities of proteins, lactose and mineral salts (2) A soft substance, as certain inorganic chlorides

b of antimony	antimonic chloride
b of arsenic	arsenous chloride
b of tin	stannic chloride
b of zinc	zinc chloride

(3) A low-melting vegetable fat, **vegetable b**, as

bambuk b	from *Bassia Parkii*
cacao b	from *Theobroma cacao*
illipé b	from *Bassia* species
nutmeg b	from *Myristica fragrans*
otoba b	from *Myristica otaba*

b fat The oily portions of the milk of mammals composed of 88 % of the glycerides of oleic stearic, and palmitic acids and 6 % of the glycerides of butyric, caproic, caprylic and capric acids, d 0 910–0 914, m 30–34 **b rock** A soft greasy compound of iron and aluminum

exuded from alumminiferous rocks **b yellow** (1) A yellow dye often used for tinting butter, *e g*, tartrazine (*2*) *p*-diaminoazo benzene (3) *4*-dimethylamino benzene-*1*-azo naphthalene

butternut Tuglans **b tree** A tree of the genus Bassia of the Sapotaceae The seeds yield an oily fat which is used for soap or lamp oil

button A small round globe or sphere of metal found in the crucible after fusion, or on charcoal after reduction of an ore

butvar Trade name for a butyral polyvinyl plastic (q v)

butyl Bu **normal-** The monovalent hydrocarbon radical C_4H_9 — or $CH_3 CH_2 CH_2 CH_2$— **iso-** *i*-Bu The monovalent hydrocarbon radical iso- C_4H_9—, or $(CH_3)_2CH CH_2$— **secondary-** The monovalent radical $CH_3 CH_2 CH Me$ — **tertiary-** The monovalent hydrocarbon radical $(CH_3)_3C$—

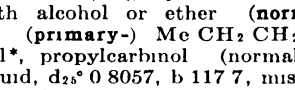
b acetate $C_6H_{12}O_2$ or MeCOOBu = 116 13 Colorless liquid, $d_{29}°$ 0 872, b 125, slightly soluble in water, miscible with alcohol or ether, used as a solvent for lacquers **b alcohol** Butyl alcohol (below) **b aldehyde** Butyraldehyde **b amine** $C_4H_{11}N$ or $BuNH_2$ = 73 15 Aminobutane (normal-) Colorless liquid, $d_{20}°$ - 0 740, b 78, soluble in alcohol, water or ether (iso-) *i*-$BuNH_2$ Colorless liquid, d 0 736, b 66, miscible with water, alcohol or ether **b benzene** $C_{10}H_{14}$ or PhBu = 134 14 (iso-) A colorless liquid, $d_{15}°$ 0 85, b 167 (sec -) A colorless liquid, $d_{15}°$ 0 873, b 171 **b benzoate** $C_{11}H_{14}O_2$ PhCOOBu = 178 18 A colorless oily liquid $d_{20}°$ 1 000, b 248 5, insoluble in water, miscible with alcohol or ether (iso-) PhCOO *i*-Bu A colorless liquid, d 1002, b 237, insoluble in water, miscible with alcohol or ether **b bromide** C_4H_9Br = 137 05 1-bromobutane*, BuBr (normal-) A colorless oily liquid, $d_{20}°$ 1 279 b 101, insoluble in water, miscible with alcohol or ether (iso-) 1-bromo-isobutane *i*-BuBr A colorless oily liquid d 1 260, b 90, insoluble in water, miscible with alcohol or ether **b butyrate** $C_8H_{16}O_2$ or PrCOOBu = 144 17 (normal-) A colorless liquid, $d_9°$ - 0 888 b 165, slightly soluble in water, miscible with alcohol or ether (iso-) PrCOO(*i*)-Bu A colorless liquid, d 0 866, b 157, very slightly soluble in water, miscible with alcohol or ether (iso-iso-) iso-butyl-isobutyric-ester $Me_2CH COO CH_2CHMe_2$ A colorless liquid, $d_0°$ 0 875, b 146, insoluble in water, miscible with alcohol **b carbamate** $C_5H_{11}O_2N$ or NH_2COOBu = 117 12 Colorless crystals (iso-) $NH_2COOCH_2 CHMe_2$ Colorless crystals, m 55, b 207, insoluble in water, soluble in alcohol, or ether **b carbinol** $C_5H_{12}O$ or $Me_3C CH_2OH$ = 88 13 Trimethylmethanecarbinol, trimethylethylalcohol, trimethylethanol Colorless crystals $d_{20}°$ 0 812, m 52, b 113, slightly soluble in water, soluble in alcohol or ether **b carbitol** See *carbitol* **b cellosolve** See *cellosolve* **b chloral** $C_4H_5OCl_3$ = 175 43 Crotonchloral, trichlorbutyl aldehyde $MeCHCl CCl_2 COH$ A colorless liquid, $d_{20}°$ 1 395, b 165, soluble in water, alcohol or ether **b chloralhydrate** $C_4H_7O_2Cl_3$ = 193 46 Crotonchloralhydrate, 2 2 3-trichlorbutan-1 1-diol, trichlorbutylidene glycol, $MeCHCl CCl_2 CH(OH)_2$ Colorless crystals, m - 78, soluble in water Used as an analgesic, hypnotic and temafuge **b chloride** C_4H_9Cl = 92 54 (normal-) 1-chlorobutane*, BuCl A colorless liquid $d_{20}°$ 0 887, b 78, insoluble in water, miscible with alcohol or ether (iso-) 1-chloroisobutane Me_2CHCH_2Cl A colorless liquid, d 0 880, b 69, insoluble in water, miscible with alcohol or ether (tert-) $Me_3C Cl$ A colorless liquid, $d_{15}°$ 0 847, b 51 **b cyanide** C_5H_9N or BuCN = 83 06 Valeronitrile A colorless liquid, $d_{20}°$ 1 0 b 141, insoluble in water, soluble in alcohol or ether (iso-) Me_2CHCH_2CN, isovaleronitrile A colorless liquid d_{20} 0 807, b 127, slightly soluble in water miscible with alcohol or ether (tert-) Me_3CCN A crystalline solid, m 15 b 105 **b ether** $C_8H_{18}O$ or Bu_2O = 130 19 B -oxide, *1*-butoxy-butane* A colorless liquid, $d_{40}°$ - 0 769, b 141, soluble in water (iso-) 1-butyloxide *2*-(α-methyl propoxy) butane* A colorless liquid, b 122°C, slightly soluble in water, miscible with alcohol or ether **b formate** $C_5H_{10}O_2$ or HCOOBu = 102 11 (normal-) Tetrylformiate A colorless liquid, $d_0°$ 0 911, b 107, slightly soluble in water, miscible with alcohol or ether (iso-) A colorless liquid, $d_{20}°$ 0885, b 98 5, miscible with alcohol or ether **b hydrate** B alcohol **b hydride** Butane **b iodide** C_4H_9I or BuI = 184 06 *1*-iodobutane* (normal-) A colorless liquid $d_{20}°$ 1 617, b 130, insoluble in water, miscible with alcohol or ether (iso-) *1*-iodo-*2*-methyl propane* A colorless liquid, $d_0°$ 1 640, m −90, b 120, insoluble in water, miscible with alcohol or ether (sec-) $Me CH_2 CHIMe$ *2*-iodobutane* A colorless liquid, $d_0°$ 1 626, b 118 (tert-) Me_3CI *2*-iodo-*2*-methyl propane* A colorless liquid, $d_0°$ 1 571, b 99 **b isobutyrate** See *b butyrate* **b isocyanide** C_5H_9N or BuNC = 83 10 Isobutylisocyanide, butylcarbylamine* A colorless liquid, $d_4°$ 0 787, m 115, slightly soluble in water, miscible with alcohol or ether **b isovalerate** See *b valerate* **b ketone** $C_8H_{18}O$ or Bu CO Bu = 142 20 Isobutylketone A colorless liquid, $d_{20}°$ 0 833, b 181, slightly soluble in water, miscible with alcohol or ether **b mercaptan** C_4H_9SH = 90 16 *1*-Butanethiol* A colorless liquid, $d_0°$ 0 858, b 92 It occurs in the odorous secretion of the skunk **b mustard oil** C_5H_9NS or BuNCS = 115 19 B sulfocyanide A colorless liquid, b 167, insoluble in water, miscible with alcohol or ether (iso-) 1-butyl mustard oil, 1-butylsulfocyanide 1-butylrhodanate A colorless liquid, $d_{20}°$ 0 943, b 162, insoluble in water, miscible with alcohol or ether (sec -) $Me CH_2 CH(NCS) Me$ A colorless liquid, $d_{12}°$ - 0 944, b 160 (tert -) $Me_3C NCS$ An oily liquid $d_{10}°$ 0 919, b 140, m 10 5 **b nitrate*** $C_4H_9O_3N$ or $BuNO_3$ = 119 13 Iso-butyl nitrate A colorless liquid d 1 021, b 123, insoluble in water, miscible with alcohol or ether **b nitrite*** $C_4H_9O_2N$ or $BuNO_2$ = 103 10 Isobutyl nitrite A colorless liquid, $d_0°$ 0 908, b 67, soluble in alcohol It also occurs in the tautomeric nitroso form, BuONO **b oxide** B ether **b oxide linkage** A bond between the first and fourth C atom of a chain through an O atom Cf *sugar, furanose* **b phenylate** B phenyl ether **b phenyl ether** $C_{10}H_{14}O$ = 150 14 Phenylbutyl oxide Butyl phenylate, BuOPh A colorless liquid, d 0 935, b 198, insoluble in water, miscible with alcohol or ether It is an antiseptic **b phenyl ketone** $C_{11}H_{14}O$ = 162 17 Phenylpentanone, Bu CO - Ph (normal-) A colorless liquid, b 239 5, miscible with alcohol or ether, insoluble in

water (iso-) A colorless liquid, d 0 993, b 225, insoluble in water, soluble in alcohol or ether **b phthalate** $C_6H_4(COOBu)_2$ A colorless liquid, b_{20mm} 204, used instead of mercury in diffusion pumps **b propionate** $C_7H_{14}O_2$ = 130 14 iso-butylpropionate, EtCOOBu A colorless liquid with a pleasant aromatic odor, d 0 893, b 136, soluble in alcohol Used in fruit essences **b rhodanate** B mustard oil **b sulfide** $C_8H_{18}S$ = 146 24 (normal-) Bu_2S A colorless liquid, d 0 852, m −79 7, b 182, insoluble in water (iso-) $(Me_2CH\text{-}CH_2)_2S$ (**sec-**) $(MeCH_2CHMe)_2S$ A colorless liquid, d 0 832, b 165 **b sulfocyanide** B mustard oil **b valerate** $C_9H_{18}O_2$ = 158 18 (normal-) n-butyl-n-valerate, BuCOOBu A colorless liquid, b 184, soluble in alcohol, used as a flavoring agent in fruit essences (iso-) $Me_2CHCH_2COOCH_2CHMe_2$, i-butyl-i-valerate A colorless liquid, d 0 848, b 169, insoluble in water, miscible with alcohol or ether

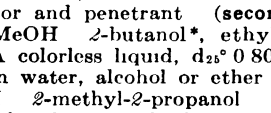
butyl alcohol $C_4H_{10}O$ or BuOH = 74 10 Butanol*, butylhydroxide, hydroxybutane (**iso-**) $Me_2CH\ CH_2OH$ Colorless liquid, $d_{33°}$ 0 7980, m −108, b 107 87, slightly soluble in water, miscible with alcohol or ether (**normal-**) See *primary* (**primary-**) $Me\ CH_2\ CH_2\ CH_2OH$ 1-butanol*, propylcarbinol (normal-) A colorless liquid, $d_{25°}$ 0 8057, b 117 7, miscible with alcohol or ether, used as a solvent, defrother, dehydrator and penetrant (**secondary-**) $MeCH_2CHMeOH$ *2*-butanol*, ethylmethylcarbinol A colorless liquid, $d_{25°}$ 0 8027 b 99 52, soluble in water, alcohol or ether (**tertiary-**) Me_3COH *2*-methyl-*2*-propanol A colorless liquid or rhombic crystals, $d_{22°}$ 0 781 m 25, b 83, miscible with water, alcohol or ether **tri-bromo-** Bromotone **trichloro-** Chloretone

butylene (1) C_4H_8 = 56 06 A gaseous hydrocarbon occurring in three isomeric forms *α*-, Δ^1-, or 1-butene, ethylethylene, $CH_2\ CH\text{-}CH_2Me$, m −130, b −18 *β*-, Δ^2- or 2-butene, Ψ-butylene, dimethylethylene $MeCH\ CHMe$, b 1, it is used as an anesthesizing gas to substitute nitrous oxide *γ*-, **iso-** or *2*-methylpropene, $Me_2C\ CH_2$ A volatile liquid or a gas, b −6 *ψ*- or **pseudo-** *β*- Butylene (2) The divalent C_4H_8= radical derived from butane **di iso-** C_8H_{16} = 112 12 The hydrocarbon $CMe_3\ CH_2\ CH\ CH_2$ *2 2 4*-trimethyl-1-pentene **tri iso-** $C_{12}H_{24}$ = 168 18 The hydrocarbon $CMe_3\ CH_2\ C\ Me\ CHCMe_3$ *2 2 4 6 6*-pentamethyl-3-heptene **methyl-** Pental

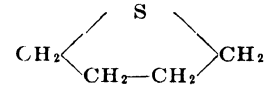
b bromide $C_4H_8Br_2$ = 215 90 1 2-Dibromo-i-butane, i-butylenebromide, $Me_2CBr\ CH_2Br$ A yellow liquid, d 1 798, b 158, miscible with alcohol (*pseudo-*) *β*-butylenebromide 2 3-dibromobutane $MeCHBr\ CHBrMe$ A yellow liquid, d 1 821, b 158, soluble in alcohol **b glycol** Butanediol **b imide** C_4H_9N = 71 10 Pyrrolidine, tetramethylene imide The heterocyclic compound,



b ketone C_5H_8O = 84 08 Ketopentamethylene The homocyclic compound,



b oxide C_4H_8O = 72 08 Tetramethylene oxide, tetrahydrofuran The heterocyclic compound $CH_2{<}{}^{CH_2—CH_2}_{}{>}O{<}{}^{}_{CH_2}$ **b sulfide** C_4H_8S = 88 15 Tetramethylene sulfide tetrahydrothiophen The heterocyclic compound



butylidene The divalent radical, $Me(CH_2)_2\text{-}CH{=}$

butyn $(C_{18}H_{30}N_2)_2\ H_2SO_4$ = 646 5 The hydrosulfate of *γ*-dibutylaminopropyl-p-aminobenzoate $(NH_2\ C_6H_4\ COO\ CH_2\ CH_2\ CH\ NBu_2)_2\text{-}H_2SO_4$ A colorless crystalline substance m-99, soluble in water, used as a cocaine substitute in local anesthesia

butyne* Butine

butyraldehyde C_4H_8O = 72 08 Butanal*, butylaldehyde, butal, butyric aldehyde butyral, PrCHO A colorless liquid, b 77 **iso-** $Me_2CH\ CHO$ A colorless liquid, d 0 794 b 63, miscible with water alcohol, or ether **hydroxy-** Aldol **trichloro-** Butyl chloral

butyramide C_4H_9ON = 87 13 Butyric amide, butanamide*, $PrCONH_2$ Colorless scales m-115, b 216, soluble in water, alcohol or ether **iso-** $Me_2CH\ CONH_2$ A crystalline solid, m 118, b 217, soluble in water or alcohol, slightly soluble in ether

butyrase An esterase See *enzymes*

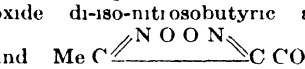
butyrate A salt or ester of butyric acid containing the monovalent $C_4H_7O_2$— or PrCOO— radical

butyrelite Bog butter A fatty substance found in peat

butyric acid $C_4H_8O_2$ = 88 80 Butanoic acid*, ethylacetic acid The fourth member of the fatty-acid series, $Me\ CH_2\ CH_2\ COOH$ or PrCOOH (normal-) A colorless liquid of unpleasant and penetrating odor d 0 960, m −8, b 162 5, miscible with water alcohol or ether It is produced in fermentation, during the decay of cheese, (see fermentation *b*), is used as a reagent in bacteriological and physiological work, as a flavor in food products, and in the preparation of esters for fruit essences (**iso-**) $Me_2CHCOOH$ A colorless liquid d-0 947, m 80, b 155 5, slightly soluble in water, miscible with alcohol or ether **amino-** $C_4H_9O_2N$ = 103 77 Aminobutanoic acid* **α-** or **1-** $NH_2\ CHEt\ COOH$ Crystals, m 285 **β-** or **2-** $NH_2CHMe\ CH_2COOH$ Crystals m-184 **γ-** or **3-** $NH_2(CH_2)_3COOH$ Crystals m 193 **iso-** $NH_2\ CMe_2\ COOH$ Liquid b-280 **α-amino-β-hydroxy-** $NH_2\ CH(CHOH\text{-}Me)COOH$ A constituent of proteins Cf *amino acids* **aminomethyl-** Isovaline **chloro-** $C_4H_7O_2Cl$ = 122 51 **α-** or **1-** $EtCHCl\ COOH$ b_{15mm} 101 **β-** or **2-** $MeCHCl\ CH_2\ COOH$ m 44 b_{13mm} 100 **β(*dl*)-** or 2(*dl*)- m 16, b_{22mm} 116 **γ-** or **3-** $Cl(CH_2)_3COOH$ m 16 b_{22mm} 196 **hydroxy-** $C_4H_8O_3$ = 104 08 $EtCHOHCOOH$ Colorless crystals m 43 b 255 (decomp.) soluble in water, alcohol or ether It is one of the "acetone bodies" of the blood **hydroxyethyl-** Diethoxalic acid **keto-** Acetoacetic acid **methyl-** *β*- Isovaleric acid *α*- Hydroangelic acid **oxy-** See *hydroxy-b* **trihydroxy-** Erythric acid

b aldehyde Butyraldehyde **b amide** C_4H_9ON = 87 13 i-butyric amide, $Me_2CH\text{-}$

$CONH_2$ Colorless leaflets, m 129, b 216, soluble in water, alcohol or ether **b anhydride** $C_8H_{14}O_3$ = 158 16 (normal-) PrCO O OCPr A colorless liquid d 0 978, b 192, decomp by water or alcohol to form the acid, soluble in ether (iso-) Me_2CHCO O $COCHMe_2$ A colorless liquid, d 0 957, b 182 5, decomp in water or alcohol **b fermentation** The production of b acid by fermentation of sugar or starch by fission ferments, such as *B butylicus*, in presence of calcium carbonate as neutralizing agent **b di-i-nitroso peroxide** $C_4H_4O_4N_2$ = 144 06 Peroxide di-iso-nitrosobutyric acid

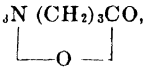


The compound Me C C COOH Colorless crystals, m 92

butyrin $C_{15}H_{26}O_6$ = 302 28 Tributyrin, triglycerol butyrate, glycerin tributyric ester $(PrCOO)_3C_3H_5$ A yellowish liquid, d 1 052, b 285, insoluble in water miscible with alcohol or ether It is a constituent of butter fat Cf *glycerides*

butyrinase An enzyme of blood serum which hydrolyzes butyrin to glycerol and butyric acid

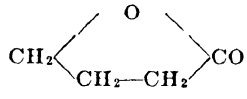
butyrobetaine The base,



m 130, b 220, occurring in mussels (*Arca noae*) snakes (*Python moluris*) and anthozoans (*Actinia equina*)

butyroin $C_8H_{16}O_2$ = 144 3 5-hydroxy-4-octanone Pr CO CHOH Pr

butyrolactone $C_4H_6O_2$ = 86 6 4-Hydroxybutanoic acid lactone*, butanolide The inner anhydride of butyric acid,



A colorless liquid, b 204

butyrometer A device, to determine the amount of butter-fat in milk

butyrone $C_7H_{14}O$ = 114 11 Dipropylketone, 4-heptanone*, Pr CO Pr A colorless liquid distilled from calcium butyrate, $d_{15°}$ 0 821, m −32 6, b 143 5, used as a solvent

butyronitrile Propylcyanide

butyrophenone $C_{10}H_{12}O$ = 148 09 Phenyl-*n*-propyl ketone, $PhCOCH_2CH_2Me$ A colorless liquid d 0 988, m 11, b 232 3, used in organic synthesis **iso-** Phenyl-i-propyl ketone, Ph-$COCHMe_2$ A liquid, d 0 984, b 217

butyrous Butter-like in consistency, *e g*, a bacterial culture

butyrum Latin for butter **b antimonii** Antimonous chloride

butyryl (normal-) The monovalent —C_4H_7O or PrCO— radical derived from n-butyric acid **(iso-)** The monovalent Me_2CHCO— radical derived from i butyric acid

b chloride C_4H_7OCl = 106 53 (normal-) Butanoyl chloride* PrCOCl A colorless liquid, d 1 026 b 101 (iso-) Me_2CH COCl A colorless liquid, d 1 0174

buxidine An alkaloid from the leaves of *Buxus sempervirens* It crystallizes as colorless prisms

buxine $C_{19}H_{21}O_3N$ = 311 22 An alkaloid from the leaves of *Buxus sempervirens*, a Buxaceae probably identical with bebeerine **pseudo-** $C_{24}H_{43}ON_2$ = 380 50 Ψ-buxine An alkaloid from the leaves of *Buxus sempervirens*

Buxton's fluid A mixture of 50 cc H_2O, 20 cc glycerin, 40 gm gum arabic, 50 gm chloral hydrate and 0 5 gm cocaine hydrochloride, used to mount microscopic specimens (arthropods) directly on the slide

buyo Betel-nut

buzane Dihydrazine

buzylene (1) Isotetrazene, diazohydrazine An unisolated azohydroxylamine compound, HN - N NH NH_2 which occurs in certain compounds, as, hippuryl-phenyl-buzylene Cf *tetrazone* (2) The bivalent —N N NH NH— radical **dihydro-** Dihydrazine

byerite A bituminous coal resembling albertite

byerlite A substance resembling asphalt, made by heating petroleum residues with sulfur in presence of air

bynin Hordenin A gliadin from malt Cf *proteins*

by-product A material obtained in addition to the principal or primary material in a manufacturing process

byssinosis A form of asthma sometimes affecting workers in textile factories

byssochlamic acid $C_{18}H_{20}O_6$ = 332 1 The dianhydride of a tetrabasic acid, produced by the action on it of the mold *Byssochlamis fulva*

byssus (1) Flax (2) Lint (3) The protein threads which attach the edible sea mussel (*Mytilus*) to rocks

bythium Eka-tellurium A supposed element of the sulfur group

bytownite A triclinic feldspar of the anorthite type Cf *silica minerals*

Bz (1) The benzoyl radical PhCO— (2) The benzene ring, similar to Py (= pyridine ring) See *quinoline*

BzH Benzaldehyde

BzOH Benzoic acid

C

C (1) The symbol for carbon (2) Abbreviation for constant °C The symbol for degree centigrade or Celsius **C acid** 2-Naphthylamine-4, 8-disulfonic acid

C Abbreviation for concentration C_v, C_p The symbols for molecular heat at constant volume or pressure C_H Hydrogen ion concentration

c Symbol for (1) the velocity of light in a vacuum $c = (2\ 99796 \pm 0\ 00004) \times 10^{10}$ cm sec^{-1}, (2) specific heat

C N Coordination number

C P Chemically pure

Ca (1) The symbol for calcium (2) Abbreviation for centare (3) Abbreviation for cathode

ca Abbreviation for candle, centare, and circa

cabasite Chabazite

cabbage The vegetable *Brassica oleracea*, a Cruciferae **c seed oil** The edible fatty oil from the seeds of *Brassica oleraceae*, a Cruciferae, used in soaps, ointments, liniments and as a substitute for olive oil **c sugar** A triose isolated from c leaves **c tree bark** Yaba bark

cabrerite A native arsenate of nickel and cobalt, $(Ni,Co)_3As_2O_8\ 8H_2O$, which occurs in green fibrous masses

cacaine Theobromine

cacao Cocoa **c butter** Oil of theobroma The yellow oil expressed after beating and crushing the seeds of *Theobroma cacao* It has a low m and is used for receptacles for drugs **c red** $(C_{17}H_{16}O_7)x$ The red pigment of c , soluble in ether or alcohol

cacaorin $C_{60}H_{84}N_4O_{15}$ A bitter glucoside from raw cacao beans, oxidized to glucose, theobromine and cacao red

cacodiliacol Guaiacol cacodylate

cacodyl (1) *Dicacodyl* (2) The monovalent radical C_2H_6As— or $AsMe_2$—, derived from arsine **di-** $C_4H_{12}As_2$ = 210 1 Dicacodyl, tetramethyl arsine $Me_2As\ AsMe_2$ A colorless poisonous liquid, m −6, b 170 **ethyl-** $C_8H_{20}As_2$ = 275 9 Tetraethylarsine $Et_2As\ AsEt_2$, a colorless liquid, b 185 (2) Diethylarsine

c chloride $AsClMe_2$ = 140 56 Dimethylarsenic chloride A colorless liquid b 100 **c cyanide** $AsMe_2CN$ = 131 06 Dimethylarsenic cyanide Colorless crystals, m 33, b 140 **c hydride** $AsMe_2H$ = 106 07 Dimethylarsine A colorless volatile liquid, d 1 213, b 36, miscible with alcohol, ether or chloroform **c oxide** $C_4H_{12}OAs_2$ = 226 1 Dimethylarsine oxide, dimethyl arsenious oxide, alkarsine, $AsMe_2\ O\ AsMe_2$ A colorless liquid, d 1 642, m −25, b 120

cacodylates The salts of the monobasic cacodylic acid, containing the $AsO\ Me_2\ O$— radical They are usually soluble in water, and are the least toxic and irritating arsenic preparations, especially for hypodermic injections **thio-** The salts of the monobasic thiocacodylic acid containing the $Me_2AsO\ S$— radical, insoluble in water, and prepared by the action of H_2S upon cacodylates

cacodylic acid $C_2H_7O_2As$ = 138 1 Dimethylarsinic acid, alkargen The monobasic acid $Me_2AsO\ OH$ Colorless crystals, m 200, soluble in water or alcohol, used in organic synthesis and in the manufacture of cacodylates **ethyl-** Diethylarsinic acid

cacotheline $C_{20}H_{22}N_2O_4(NO_2)_2$ = 462 2 A red compound formed from brucine by the action of nitric acid, it forms green and violet salts with SO_2 and $SnCl_2$, and is a reagent for tin

cacoxenite A yellow phosphate of iron which occurs with limonite

cactine An alkaloid from *Cereus grandiflorus* (night blooming cactus)

cactoid The combined principles from the freshly tinctured leaves and stems of *Cereus grandiflorus*, used as a heart stimulant

cactus A family of plants, Cactaceae, with succulent stems and thorny leaves, including the genera *Anhalonium*, *Cereus* and *Opuntia* Cf *prickly pear*, *mescal buttons*, *cochineal* **c alkaloids** See *anhalonium alkaloids*, *cactine*, *pilocerine*, *pectenine*

cadalene $C_{15}H_{18}$ = 198 14 *3 8*-Dimethyl-*5*-isopropylnaphthalene A reduction product of cadinene and zingiberene

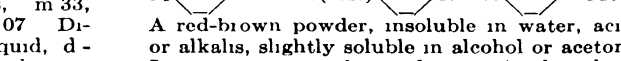
cadaverine $C_5H_{14}N_2$ = 102 1 Pentamethylene diamine, 1 5-pentanediamine*, *1 5*-diaminopentane, amylene diamine $NH_2(CH_2)_5NH_2$ A ptomaine formed by the hydrolysis of proteins and putrefying animal tissues It is an isomer of sapin Colorless liquid, d 0 885, m 9, b 178

cadaverines Ptomaines

cade oil Juniper tar oil The yellow essential oil obtained in the dry distillation of *Juniperus oxycedrus* and other species, d 0 980–1 055 Soluble in alcohol, ether, or carbon disulfide, the chief constituent is cadinene Used in soaps, ointments, and pharmaceutical products

cadinene $C_{15}H_{24}$ = 204 2 A sesquiterpene, d 0 918, b 275, and constituent of essential oils from juniper species and cedars It is probably *3 8*-dimethyl-*1 4 7*-trihydro-*5*-isopropyl naphthalene

cadion p-Nitrobenzene diazoamino azo-benzene



A red-brown powder, insoluble in water, acids or alkalis, slightly soluble in alcohol or acetone It is a reagent for cadmium (pink colour) and magnesium (blue colour) **c -2D** 4-nitro naphthalene diazo amino azo benzene It is also used as a reagent for cadmium

cadmia An ancient name for zinc or zinc carbonate

cadmium Cd = 112 41 An element of the zinc family, atomic number 48 A white, ductile metal, d 8 625, m 321 6, b 778 Insoluble in water, dissolved by acids It is found in zinc ores, and obtained as a by-product in the distillation of zinc Cadmium is generally divalent

and closely associated with zinc, but compounds with monovalent cadmium (cadmous) have been prepared Its compounds are poisonous and its salts are little ionized It was discovered in 1817 simultaneously by Strohmeyer and Herman, and is used mainly for electrodes in standard cells and as a constituent of alloys of low melting point, (*e g* Wood's alloy) **c acetate** $Cd(OOCMe)_2 3H_2O$ = 284 5 White monoclinic crystals d 2 01 soluble in water It is a reagent for determining sulfur selenium or tellurium in iron and steel, and is also used in dentistry **c alloys** A mixture of cadmium with other metals The m p of some alloys, in °C, are

Cd	90 %	80 %	70 %	60 %	50 %
with	10 %	20 %	30 %	40 %	50 %
Ag	420°	520°	610°	700°	760°
Na	390°	360°	340°	330°	352°
Tl	300°	285°	270°	262°	258°
Zn	280°	270°	295°	313°	327°

c amalgam An amalgam of cadmium and mercury, used in dentistry and for the cadmium cell (q v) **c boro-tungstate** $Cd_3B_2W_9O_{32}$ - $18H_2O$ = 2739 1 Yellow crystals or a yellow liquid d 3 28, soluble in water, and used in mineralogy for separating minerals and metals mechanically (see *Klein's liquid*) **c bromate** $Cd(BrO_3)_2$ = 368 2 A colorless crystalline powder which is soluble in water **c bromide** $CdBr_2$ = 272 2 Colorless crystals $d_{25°}$ 5 192, m 568, b 810, soluble in water, alcohol or ether (**cryst**) $CdBr_2 4H_2O$ = 344 3 White crystals, soluble in water, alcohol or ether, used in photography **c carbonate** $CdCO_3$ = 172 4 Otavite White rhombic crystals or an amorphous powder, $d_4°$ 4 258, decomp on heating insoluble in water, soluble in acids or ammonium salt solutions **c cell** C normal element **c chlorate** $Cd(ClO_3)_2$ = 279 2 White crystals, soluble in water **c chloride** $CdCl_2$ = 183 3 White crystals, d 3 32, soluble in water, alcohol or ether (**cryst**) $CdCl_2 2H_2O$ = 219 3 White monoclinic crystals, soluble in water, alcohol or ether It is a reagent for pyridine bases and is used in photography, the dye industry, and in textile printing **c chloroacetate** (1) *mono*- $(CH_2Cl COO)_2Cd 6H_2O$ = 407 45 Colorless crystals d 1 942 (2) *di*- $(CHCl_2 COO)_2Cd$ - H_2O = 386 27 Colorless crystals d 2 132 (3) *tri*- $(CCl_3COO)_2Cd 1½H_2O$ = 464 18 Rhombic crystals, d 2 093 **c cinnamate** $(C_6H_5 CH CHCOO)_2Cd$ = 406 52 White powder, insoluble in water **c cyanide** $Cd(CN)_2$ = 164 1 A colorless powder, soluble in water or alcohol **c diethyl*** $Cd(C_2H_5)_2$ = 170 49 Ethylcadmium A colorless liquid, d 1 653, m −21, b_{20mm} 64 **c dimethyl*** $Cd(CH_3)_2$ = 142 16 Methylcadmium A colorless liquid, d 1 9846 m −4 5, b 106 **c ferricyanide** $Cd_3[Fe(CN)_6]_2$ = 972 7 A brownish-red crystalline powder, soluble in water **c ferrocyanide** $Cd_2Fe(CN)_6$ = 436 2 A yellow crystalline powder, soluble in water **c fluoride** CdF_2 = 150 4 White crystals, d 6 64, m 520, b 1000, soluble in water or alcohol **c fluosilicate** $CdSiF_6$ = 254 47 C silicofluoride Hexagonal, white crystals soluble in water or alcohol **c formate** $Cd(OOCH)_2$ = 202 1 A colorless powder, d 2 44 which is soluble in water **c fumarate** $Cd_2C_4H_2O_4$ = 338 84 A white powder, insoluble in water **c hydroxide** $Cd(OH)_2$ = 146 4 White hexagonal crystals, $d_{15°}$ 4 79, slightly soluble in water, soluble in acids or ammonium salt solutions **c iodate** $Cd(IO_3)_2$ = 462 27 A white crystalline powder d 6 48 decomp on heating, slightly soluble in water, soluble in acids or ammonium salt solutions It forms the hydrate $Cd(IO_3)_2 H_2O$ = 480 20, and the ammonate $Cd(IO_3)_2 4NH_3$ = 530 4, which explodes on heating **c iodide** CdI_2 = 366 27 Colorless scales which occur in two allotropic modifications *α*- d 5 67 m 388 b 712 and *β*- d 5 30, m 404 Soluble in water, alcohol, ether, or ammonium hydroxide Used as a reagent for alkaloids and nitrous acid in photography, and medicinally as an antiseptic in ointments **c lactate** $Cd(C_3H_5O_3)_2$ = 290 2 A colorless powder slightly soluble in water **c line** The red radiation from cadmium vapor which serves as the fundamental standard of length, 1,533,164 14 waves equal one meter **c lithopone** See *lithopone* **c malate** $CdC_4H_2O_4$ - $2H_2O$ = 374 87 A white powder slightly soluble in water **c methide** $Cd(CH_3)_2$ = 142 4 Dimethylcadmium $CdMe_2$, sometimes used in Grignard's reaction **c minerals** Cd always occurs in association with zinc, though in small quantities and is a relatively rare element Its chief ores are greenockite CdS, and the carbonate and oxide Zn is 200 times more abundant than cadmium **c nitrate** (1) $Cd(NO_3)_2$ = 236 42 Colorless powder, m 350 (2) hydrate $Cd(NO_3)_2 4H_2O$ = 308 49 Colorless prismatic needles d 2 455 m 59 4°, b 132, soluble in water or alcohol It is a reagent for zinc and ferrocyanides, used in the manufacture of cadmium yellow, and in the glass industry and ceramics for obtaining yellow glazes or orange colors **c normal element** C cell, Weston element An H-shaped glass vessel with platinum contacts used as a standard cell for potentiometric measurements The cathode is Cd-amalgam the anode mercury and the electrolyte saturated Cd sulfate solution A reproducible potential of 1 0186 volts at 18°C, is obtained **c oxalate** CdC_2O_4 = 200 41 A white powder, d 3 32, m 340 (2) hydrate $CdC_2O_4 3H_2O$ = 254 46 A white powder, insoluble in water, soluble in acids or dilute ammonium hydroxide **c oxide** (1) CdO = 128 41 An amorphous brown or yellow powder or cubical crystals, d 6 95 to 8 15, insoluble in water soluble in acids or ammonium salt solutions (2) Cd_2O = 240 82 Cadmous oxide A yellowish powder d 8 192 decomp when heated (3) Cd_4O = 465 64 Cadmium suboxide A brown amorphous powder, decomp by water, acids, or ammonium hydroxide (4) Cd peroxide An insoluble compound, CdO_2, Cd_3O_5 or $Cd O_8$ **c oxybromide** CdO - $CdBr_2 H_2O$ = 418 67 A yellow powder, d 4 87, decomp by water **c oxychloride** CdO - $CdCl_2 H_2O$ = 329 75 A colorless powder, d 4 56, decomp 280, slightly soluble in hot water, and slowly decomp by it **c permanganate** $Cd(MnO_4)_2$ = 350 0 A purple crystalline powder, soluble in water **c peroxide** C oxide (4) **c phosphate** $Cd_3(PO_4)_2$ = 526 0 A white powder, insoluble in

water **c plating** A coating of c on iron wire, springs, tools and other steel articles, to make them rust-proof **c potassium cyanide** $Cd(CN)_2\ 2KCN$ = 294 5 A white crystalline powder, soluble in water **c potassium iodide** $CdI_2\ 2KI\ H_2O$ = 716 31 A white powder which yellows on aging, soluble in water or alcohol It is a reagent for alkaloids **c red** (1) A mixture of C selenide, sulfide and $BaSO_4$ (2) A mineral pigment containing 60 % Cd, 25 % S and 15 % Se **c salicylate** $Cd(C_7H_5O_3)_2 \cdot H_2O$ = 404 1 White needles, soluble in water or alcohol, used as an astringent in ophthalmology **c selenate** $CdSeO_4$ = 255 1 A colorless crystalline powder, soluble in water **c selenide** CdSe = 191 6 A red powder, insoluble in water, used in rubber manufacture to increase resistance to abrasion **c silicofluoride** C fluosilicate **c suboxide** Cd_4O = 465 64 C oxide (3) **c succinate** $CdC_4H_4O_4$ = 228 0 A white powder slightly soluble in water, soluble in alcohol **c sulfate** $CdSO_4$ = 208 0 White rhombic crystals, d 3 05, m 1000, soluble in water, insoluble in alcohol (**cryst**) (1) $CdSO_4\ 4H\ O$ = 280 5 White crystals, d 3 05, soluble in water (2) $3CdSO_4\ 8H_2O$ = 769 5 White monoclinic crystals, $d_{25°}$ 3 087, soluble in water or alcohol Used in electrotechnics for filling cadmium normal cells, and medicinally as an antiseptic and astringent in eye-washes **c sulfide** CdS = 144 5 Greenockite Two modifications (1) *orange* A reddish-yellow powder, insoluble in water, used as a pigment and in pyrotechnics (2) *light yellow* Cadmium yellow, jaune brillant Yellow hexagonal crystals or powder, d 4 8, insoluble in water used as a pigment for yellow and greenish tints and for coloring soaps in ceramics, rubber and pyrotechnics **c sulfite** $CdSO_3$ = 192 0 A white powder slightly soluble in water **c tartrate** $Cd(C_4H_4O_6)(H_2O)$ A white crystalline powder, slightly soluble in water, soluble in acids **c tungstate** $CdWO_4$ = 360 0 A colorless powder insoluble in water **c valerate** $Cd(C_5H_9O_2)_2$ = 314 2 Colorless scales soluble in water or alcohol, used as an antispasmodic **c wolframate** C tungstate **c yellow** C sulfide

cadmous A compound of monovalent Cd, as, cadmous oxide Cd_2O

cæ See *ce*

Cæsalpinia, Caesalpinia A genus of trees, Leguminosae of tropical and subtropical countries

C coriaria	dividivi ellagitannic acid
C sappan	brazilwood sappan wood
C bonducella	bonducin

cæsium, caesium See *cesium*

caferana Tachia The dried roots of *Tachia guianensis*, a Gentianaceae of Brazil, used as a tonic and antiperiodic

caferanine A crystalline principle in caferana

caffalic acid $C_{34}H_{54}O_{11}$ = 702 4 An acid in coffee

caffeic acid $C_9H_8O_4\ \frac{1}{2}H_2O$ = 189 12 3 4-dihydroxycinnamic acid, 3 4-dioxyphenyl acrylic acid Yellow prisms in black fir resin, m 195, decomp on further heating, soluble in water or alcohol **dimethylhydro-** $C_{11}H_{14}O_4$ = 210 11 Colorless crystals, m 96 **hydro-** $C_9H_{10}O_4$ = 182 08 3 4-dioxyphenyl propionic acid Colorless crystals, m 213

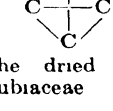
caffeine $C_8H_{10}O_2N_4\ H_2O$ = 212 30 Theine, methyltheobromine, 1 3 7-trimethyl-xanthine, guaranine, caffeine, psoraline A diureide found in coffee, tea, and cola nuts, as long white needles of bitter tasts, $d_{19°}$ 1 23, m 230, b 235, soluble in water, alcohol, ether or chloroform Used medicinally as a diuretic or heart stimulant **bromo-** See *bromo c* **chloral-** See *chloral c* **ethoxy-** See *ethoxy c* **hydroxy-** $C_8H_{10}O_3N_4$ = 210 2 1 3 7-trimethyl-uric acid Fine white needles, m 345, soluble in hot water, acids or alkalis, used as a diuretic **phenoxy-** See *phenoxy c*

c arsenate $C_8H_{10}N_4O_2\ H_3AsO_4$ = 336 1 A white powder, soluble in hot water, used for neuralgia **c benzoate** $C_8H_{10}N_4O_2\ C_7H_6O_2$ = 316 23 A white, crystalline powder, soluble in water or alcohol **c citrate** $C_8H_{10}O_2N_4\ C_6H_8O_7$ = 386 25 A white, crystalline powder, soluble in water, alcohol or chloroform, used similarly to caffeine **c hydrobromide** $C_8H_{10}O_2N_4\ HBr$ = 275 03 A white, crystalline powder, soluble in water **c hydrochloride** $C_8H_{10}O_2N_4\ HCl + 2H_2O$ = 266 56 A white crystalline powder, which is soluble in water **c nitrate** $C_8H_{10}O_2N_4\ HNO_3$ = 257 30 A white, crystalline powder, soluble in water **c phenylate** $C_8H_{10}O_2N_4\ C_6H_6O\ H_2O$ = 306 35 A white, crystalline powder, soluble in water **c salicylate** $C_8H_{10}O_2N_4\ C_7H_6O_3$ = 332 33 A white, crystalline powder, soluble in water or alcohol **c sodium benzoate** A mixture of caffeine and sodium benzoate, very soluble in water, used in hypodermic medication **c sodium bromide** A mixture of 60 % caffeine and 40 % sodium bromide A white powder, very soluble in water **c sodium citrate** A mixture of 50 % caffeine and 50 % sodium citrate A white powder, very soluble in water **c sodium salicylate** A mixture of 45 % caffeine and 55 % sodium salicylate A white powder, very soluble in water **c sulfate** $(C_8H_{10}O_2N_4)_2\ H_2SO_4$ = 486 65 A white crystalline powder, decomp in water **c sulfonate** Symphorol **c triiodide** $C_8H_{10}O_2N_4I_2\ 2HI$ = 703 98 Dark green prisms, m 171, decomp in water or alcohol, used medicinally as an alterant and diuretic **c valerate** $C_8H_{10}O_2N_4\ C_5H_{10}O_2$ = 296 34 A white, crystalline powder, decomp by alcohol, used medicinally for nervous headaches and hysteria

caffelite A plastic material derived from coffee

caffetannic acid $C_{15}H_{18}O_9$ = 342 14 Chlorogenic acid A tannin which occurs in coffee berries, cainia root, nux vomica St Ignatius beans, etc, as its calcium or magnesium salt An amorphous powder, soluble in water or alcohol

cage type Ladenburg's formula for benzene or a ring-system of the type



cahinca David's root The dried roots of *Chiococca racemosa*, a Rubiaceae See *chiococcetne*

cahincic acid $C_{40}H_{64}O_{18}$ = 832 6 Caincic acid A glucoside, the active principle of cahinca root White, odorless, bitter crystals, soluble in water, used as a tonic, purgative, and diuretic Cf *chiococcic acid, caincetin*

Cailletet, Louis A French iron-master noted for liquefying gases

caincetin $C_{22}H_{14}O_3$ = 346 3 White crystals, obtained by decomp of cahincic acid

caincic acid Cahincic acid

caincin Cahincic acid

cairngorm A variety of quartz

cajeput Cajuput, tree tea, swamp tea The leaves of *Melaleuca leukadendron*, a Myrtaceae of East India **c oil** The colorless or greenish essential oil of cajeput Its chief constituents are cineol and terpineol $[a]_D$ = −10° to −4°, soluble in alcohol or ether

cajeputene Terpene

cajuput Cajeput

cajuputol Eucalyptol

cake Any solid crystalline mass **niter-** Sodium sulfate containing about 33 % HSO_4 A by product of nitric acid manufacture **salt-** Sodium sulfate

caking The transformation of a powdered substance into a solid mass either by moisture, heat or pressure

Cal An abbreviation for large calorie Kg-cal or Calorie

cal An abbreviation for small calorie, gm-cal or calorie

calabar bean Physostigma **false-** Pseudophysostigma

calabarine An alkaloid from calabar bean

Calais sand A very fine sand found near Calais France which is used as an abrasive, e g for cleaning platinum ware

calamene $C_{15}H_{24}$ = 204 19 A sesquiterpene from calamus oil

calamine (1) $Zn(OH)_2 \cdot Zn_3Si_2O_7 \cdot H_2O$ A native zinc silicate (2) The obsolete name for zinc carbonate, now called smithsonite **c brass** Brass

calaminth Basil thyme mountain minth The plant, *Calamintha officinalis*, a Labiatae, used as diaphoretic and expectorant It contains calaminthone

calaminthone $C_{10}H_{16}O$ = 152 2 A ketone found in French oil of majoram, distilled from the leaves of *Calamintha nepeta* a Labiatae

calamus Sweet flag, sweet grass, sweet cane The dried rhizomes of *Acorus calamus*, an Araceae, used as fluid extract, tincture, stimulant and carminative tonic Cf *acorin, acoretin* **c oil** The brownish, heavy, essential oil from calamus Its chief constituents are asarone and eugenol Used medicinally, in perfumes, and as a flavoring

calaverite $(Au, Ag)Te_2$ A native gold telluride containing 40 % Au, found at Cripple Creek, Colorado and in Calaveras County, California

calaya An extract from the fruit of *Anneslea febrifuga*, a Theaceae, used medicinally as an antiperiodic

calc spar Calcite

calcareous, calcarious Containing calcium **c algae** The algae of the genus *Lithothamnium*, which have skeletons containing 95 % calcium carbonate and 5 % magnesium carbonate Their deposits form limestone Cf *coccolith* **c sinter** Travertine, onyx A tufa, or the deposits of calcium carbonate formed by the evaporation of hard waters or mineral waters containing calcium bicarbonate

calcariuria The abnormal elimination of calcium salts in the urine

calcemic dose A dose of vitamin D equivalent to 50,000–1,000,000 I U per day which promotes mobilisation of calcium from the skeleton and its subsequent secretion, as distinct from the antirachitic dose of 700–1000 I U per day

calcic Pertaining to calcium

calcification Hardening due to formation of calcium salts *e g*, as of tissues

calciferol See *vitamin*

calcii The official Latin genitive of calcium

calcimeter An apparatus for the determination of carbonates by liberating CO with acid and absorbing it in alkali

calcination Roasting The formation of oxides by heating oxy salts, *e g*, CaO from $CaCO_3$, FeO from $FeSO_4$, or any process of expelling the volatile portions of a substance by heat, usually without access of air Cf *roasting*

calcined Heated to a high temperature **c phosphate** A fertilizer obtained by roasting finely-ground phosphate rock with potassium salts

calcinol Calcium iodate

calcioferrite A phosphate of iron found in sedimentary beds of limonite

calciovolborthite A native copper and calcium vanadate

calcite $CaCO_3$ Calcspar A hexagonal, normally colorless, rock-forming mineral, d 2 72, hardness 3 The crystalline species are Iceland spar (birefringent) corn spar, and satin spar, while the amorphous varieties include chalk marble, limestone, stalactite, baryte, spongy as mountain milk, flake like as schiefer spar **baryto-** Alstonite **chloro-** Hydrophilite

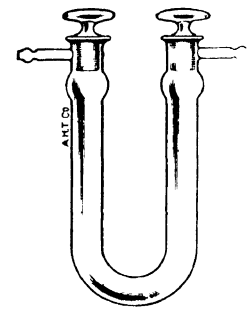
calcitization The conversion of marble to calcite, *e g*, at Marble Delta (Natal)

calcium Ca = 40 08 An element of the magnesium family atomic number 20 A white, crystalline metal d 1 415, m 810, soluble in water forming the hydroxide and readily dissolved in acids forming salts It is widely distributed in nature and next to aluminum and iron, the most abundant metal It is found in large quantities as carbonate (limestone marble, chalk, aragonite, calcite Iceland spar etc), sulfate (gypsum), fluoride (fluorspar), phosphate (apatite) and as complex silicates (feldspar, amphiboles, pyroxenes, etc) Its compounds are not poisonous, and many of its salts are strongly ionized It is essential to life and man's daily requirement of 0 7 gm should be supplied by milk (1 5 lbs) or cheese (0 25 lb) as no other foods contain it in sufficient quantities It was isolated by Davy in 1808 by electrolysis Metallic calcium is made by electrolysing a fused mixture of fluorspar and calcium chloride Calcium is divalent, and forms only one series of compounds Metallic calcium is used in organic synthesis as a deoxidizer in alloys, in the preparation of metals, as reducing agent, as a purifier for argon in rectifiers and with lead, as antifriction alloys Many of its compounds are of great economic importance

c acetate $Ca(OOCMe)_2 \cdot H_2O$ = 176 1 White crystalline needles, or amorphous white powder decomp on heating soluble in water or alcohol Used in the manufacture of acetic acid and acetone, and in the dye-industry

c albuminate A compound of calcium and albumin A light-brown granulated mass, slightly soluble in water, used as an alterant and nutrient **c arsenate** $Ca_3(AsO_4)_2$ = 398 0 Tricalcium-orthoarsenate Normal c arsenate A white powder, slightly soluble in water, soluble in acids Used as an insecticide spray

for trees and shrubs **c arsenite** $Ca_3(AsO_3)_2$ = 366 0 A white granular powder, slightly soluble in water **c behenate** $Ca(C_{22}H_{43}O_2)_2$ = 718 6 A colorless crystalline power (**dibrom-**) Sabromin (**monoiodo-**) Sajodin **c benzoate** $Ca(C_7H_5O_2)_2\,3H_2O$ = 336 3 A colorless crystalline powder, d 1 436, soluble in water, used as an alterant and antiseptic **c biarsenate** $CaH_4(AsO_4)_2$ = 322 1 A white powder, slightly soluble in water, used as an insecticide and spray, *e g* to exterminate cotton-boll weevil **c bichromate** $CaCr_2O_7$ = 256 1 Reddish-brown hygroscopic crystals, soluble in water **c bimalate** $CaH_2(C_4H_4O_5)_2\,6H_2O$ = 408 2 A white powder, sparingly soluble in water **c biphosphate** See *c phosphate* **c bisulfite** $Ca(HSO_3)_2$ = 202 8 An aqueous solution of this salt is used as an antiseptic and disinfectant, and medicinally, as a gargle or spray, also in breweries, to prevent fermentation **c bitartrate** $CaH_2(C_4H_4O_6)_2$ = 338 1 White crystals, soluble in hot water **c borate** $Ca(BO_2)_2\,2H_2O$ = 161 7 White crystals soluble in hot water or in dilute acids It is an antiseptic and astringent **c borocitrate** A white powder, slightly soluble in water, soluble in dilute acids **c bromide** $CaBr_2$ = 199 9 White granular powder or needles, $d_{20°}$ 3 354, m 760, b 809, soluble in water or alcohol It is a sedative, nervine, and substitute for potassium bromide, and is used in photography (**cryst**) $CaBr_2\,6H_2O$ = 308 1 White needles, d 3 32, m 38, b 150 very soluble in water or alcohol **c bromiodide** $CaBr_2CaI_2$ = 493 6 A yellow powder, soluble in water, used as a sedative and alterant **c butyrate** $Ca(C_4H_7O_2)_2\,H_2O$ = 232 2 Colorless crystals, soluble in water **c cacodylate** $Ca(Me_2AsO_2)_2\,H_2O$ = 332 1 A white powder, soluble in water, used in hypodermic medication **c carbide** CaC_2 = 64 0 A gray, crystalline, granular mass, $d_{18°}$ 2 22, decomp in water, soluble in alcohol Used in preparing acetylene gas for illumination or blast flames, and for bicycle and miner's lamps Cf *acetylith* **c carbonate** $CaCO_3$ = 100 0 A rock-forming substance (calcite, q v), widely distributed, occurs in rhombohedric or rhombic white crystals, or as an amorphous fine white powder, d 2 7–2 949, decomp at 825, insoluble in water, soluble in acids Used medicinally as an antiacid, and as a constituent of tooth-paste, white paint, calsomine, cleaning powder, paper filler, and for the preparation of carbon dioxide (γ-) Vaterite **c chinate** C quinate **c chinovate** A compound of calcium and chinovose A white or yellowish powder, soluble in alcohol, used as a tonic in malaria **c chlorate** $Ca(ClO_3)_2\,2H_2O$ = 242 9 White monoclinic crystals, decomp by heat, soluble in water or alcohol Used in photography, pyrotechnics in manufacturing soda water and as a dusting powder to kill poison ivy and poison oak **c chlorhydrophosphate** C chlorphosphate **c chlorhydrosulfate** C chlorsulfate **c chloride** $CaCl_2$ = 111 1 A white granular, deliquescent powder, $d_{20°}$ 2 152, m 774°C, soluble in water or alcohol It is used as a drying agent in desiccators, for raising the boiling point of solutions, in preserving meat, in freezing mixtures in preserving stones, for impregnating textiles to make them less inflammable, as a dust preventor on roads (halophilite), and in the manufacture of hydrochloric acid, alizarin, and sugars (**ammonia-**) The unstable compound $CaCl_2\,8NH_3$ (**cryst**) $CaCl_2\,6H_2O$ = 219 1 $CaCl_2\,2H_2O$ also exists Colorless, hexagonal crystals, d 1 654, m 29 5 b 130, very soluble in water or alcohol Used medicinally in pruritus, and prurigo, and to stop external or internal bleeding, also in breweries and soda-water manufacture (**fused-**) Calcium chloride (**c tube**) A glass tube or glass vessel filled with calcium chloride and used for drying gases or for the qualitative or quantitative absorption of water



Calcium chloride tube

c chlorophosphate C chlorhydrophosphate A yellow powder, soluble in water An aqueous solution containing 25 % of the salt, d 1 225 is used as a tonic and alterant **c chlorosulfate** Calcium chlorhydrosulfate A white powder almost insoluble in water **c chromate** $CaCrO_4\,2H_2O$ = 192 2 A yellow crystalline powder, slightly soluble in water, soluble in alcohol or acids **c cinnamate,** or **c cinnamylate** $Ca(C_9H_7O_2)_2\,3H_2O$ = 388 25 White crystals, soluble in hot water **c citrate** $Ca_3(C_6H_5O_7)_2\,4H_2O$ = 570 31 White crystals, slightly soluble in water **c cyanamide** $CaCN_2$ = 80 1 A white or grayish powder, decomp by water, an intermediate in the fixation of atmospheric nitrogen Used as catalyst in the manufacture of NH_3 See *cyanamid, nitrolim* **c cyanide** $Ca(CN)_2$ = 92 1 Calcyanide, "powdered cyanic acid" Colorless regular crystals, or a fine white powder, decomp in moist air or water, and forms cyanic acid Used in fumigation **c dibrombehenate** Sabromin **c ethylsulfate** $Ca(EtSO_4)_2\,H_2O$ = 308 33 C sulfovinate White crystals, soluble in water, slightly soluble in alcohol **c ferricyanide** $Ca_3[Fe(CN)_6]_2\,H_2O$ = 562 4 Red deliquescent needles, soluble in water **c ferrocyanide** $Ca_2Fe(CN)_6$ = 292 2 Yellow crystals, soluble in water **c ferrophospho-lactate** A white powder, soluble in hot water, used medicinally in making syrups **c fluoride** (1) CaF_2 = 154 07 Colorless regular crystals, d 3 18 m 1378, sparingly soluble in water, soluble in water containing carbon dioxide, decomp by acids Used for etching glass, in the preparation of enamels, and in the manufacture of hydrofluoric acid (2) Fluorite **c fluosilicate** $CaSiF_6\,2H_2O$ = 218 17 C silicofluoride Hexagonal crystals, d 2 254, slightly soluble in water **c formate** $Ca(OOCH)_2$ = 130 0 A white crystalline powder, d 2 015, soluble in water **c fumarate** $CaC_4H_2O_4\,3H_2O$ = 208 14 Rhombic, white crystals, soluble in water **c gluconate** $(C_5H_{11}O_5COO)_2Ca\,H_2O$ = 448 3 The calcium salt of gluconic acid A white, odorless powder, soluble in water, insoluble in alcohol, used in calcium therapy **c glycerinate** $Ca(C_3H_5O_4)_2\,2H_2O$ = 286 20 A white powder, is soluble in water **c glyceroborate** A colorless crystalline crust, used as an antiseptic, and preservative **c glycerophosphate** $CaPO_4C_3$-

$H_5(OH)_2\,2H_2O$ = 246 18 Neurosin A white crystalline powder, soluble in water, used as a nervine tonic **c glycollate** $Ca(C_2H_3O_3)_2 \cdot H_2O$ = 208 1 White crystals, slightly soluble in water **c hippurate** $Ca(C_9H_8O_3N)_2$ = 396 1 A white crystalline powder, slightly soluble in water, used as an antarthritic and alterant **c hydride** CaH_2 = 42 0 Hydrolith A colorless amorphous powder, insoluble in water Used in organic synthesis **c hydroxide** $Ca(OH)_2$ = 74 1 Hydrated lime, slaked lime, white hexagonal crystals or powder, d 2 078 decomp on heating slightly soluble in water, soluble in ammonium chloride solution or alkalis Used in making lime water and mortar **c hypochlorite** $Ca(OCl)_2\,4H_2O$ = 215, or $CaOCl_2\,xH_2O$ A white powder of variable composition, used as an antiseptic and disinfectant, or as a bleaching and deodorizing agent, as an oxidizing agent and for the preparation of chlorine Cf *bleaching powder* **c hypophosphate** $Ca(H_2PO_2)_2$ = 170 2 Monoclinic white or grayish crystals, decomp at red heat and soluble in water Used medicinally in phthisis and nutritive disturbances **c hyposulfite** See (1) *c bisulfite* or (2) *c thiosulfate* **c iodate** $Ca(IO_3)_2\,6H_2O$ = 498 8 Calcinol White rhombic prisms decomp on heating, slightly soluble in water insoluble in alcohol, used as an external and internal antiseptic, and as a substitute for iodoform **c iodide** CaI_2 = 293 9 A yellowish-white powder, $d_{25°}$ 3 956, m 631, b 712, soluble in water or alcohol, used medicinally in syphilis, and as a substitute for potassium iodide (cryst) $CaI_2\,6H_2O$ = 402 0 Colorless plates or scales, m 42, b 160, very soluble in water Used in photography **c isobutyrate** $Ca(C_4H_7O_2)_2\,5H_2O$ = 304 1 Colorless, monoclinic needles, soluble in water **c lactate** $Ca(C_3H_5O_3)_2\,5H_2O$ = 308 3 White crystalline masses soluble in water, used medicinally for rachitis and scrofula **c lime** Quicklime containing 75 % or less of CaO **c linoleate** $Ca(C_{18}H_{31}O_2)_2$ = 598 56 White amorphous powder, insoluble in water, soluble in alcohol or ether **c loretinate** A white powder, used in manufacturing antiseptic gauze **c magnesium phosphate** A mixture of calcium and magnesium phosphates A white powder, insoluble in water **c malate** $CaC_4H_4O_5$ (1) *active-* $2H_2O$ = 208 14 (2) *racemic-* $3H_2O$ = 226 16 Rhombic, colorless crystals slightly soluble in water **c maleate** $Ca(C_4H_3O_4$ = 172 11 Rhombic, colorless crystals soluble in water **c malonate** $Ca(C_3H_2O_4\,4H_2O$ = 214 16 White powder, insoluble in water **c manganite** CaO,MnO_2 = 143 02 Formed in solution in the Weldon process (q v) **c meconate** $CaC_7H_2O_7\,H_2O$ = 256 12 A yellowish-white powder, sparingly soluble in water **c metabisulfite** C bisulfite **c metaphosphate** C phosphate (2) **c methylsulfate** $Ca(MeSO_4)_2$ = 262 0 White crystals, soluble in water **c minerals** Calcium is one of the most abundant metals and an essential constituent of many rocks, *e g* ,

limestone, calcite, q v	$CaCO_3$
gypsum	$CaSO_4$
fluorspar	CaF_2
apatite	$3\,Ca_3(PO_4)_2,\,CaF_2$

c monoiodo behenate Sajodin **c monophosphate** See *c phosphate* (3) **c nitrate** $Ca(NO_3)_2$ = 164 1, or $Ca(NO_3)_2\,4H_2O$ = 236 1 Colorless monoclinic crystals, $d_{15°}$ 1 9, m 43, b 132, very soluble in water, slightly soluble in alcohol, used as a fertilizer (Norge niter, Norway saltpeter), and in explosives Cf Baldwin s *phosphorus* **c nitride** Ca_3N_2 = 148 0 A brown mass, d *2* 63, m 900, decomp in water **c nitrite** $Ca(NO_2)_2$ = 132 1 Colorless hexagonal prisms, very soluble in water, slightly soluble in alcohol **c oleate** $Ca(C_{18}H_{33}O_2)_2$ = 602 6 A yellowish granular powder, soluble in alcohol or ether **c oxalate** $CaC_2O_4\,H_2O$ = 146 0, or $Ca(OOC)_2$ = 128 0 A white amorphous powder or micro-crystalline mass, d 2 *2*, insoluble in water, and soluble in acids See *raphides* **c oxide** CaO = 56 0 Lime, burnt lime, quick lime, caustic lime, calx White masses, $d_{5°}$ 3 306 m 1995, sparingly soluble in water (lime water), soluble in acids Used as a reagent, and medicinally as an antiacid and mild caustic Commercial grades are used in mortar, and for causticising soda ash **c oxychloride** $CaOCl_2$ Bleaching powder **c oxysulfide** CaO CaS = 128 0 A yellow powder, used in aqueous solution for skin diseases **c palmitate** $Ca(C_{16}H_{31}O_2)_2$ = 550 6 Yellow white crystals, insoluble in water, soluble in alcohol **c permanganate** $Ca(MnO_4)_2 \cdot 4H_2O$ = 330 0 Aceidol Purple hygroscopic prisms decomp on heating soluble in water It is an antiseptic and disinfectant, used in dentistry and in disinfecting drinking water **c peroxide** CaO_2 = 72 0 A light cream-colored, odorless, tasteless powder, decomp in water Used as an antiacid detergent, antiferment bactericide and antiseptic **c phenate** Ca(OPh) = 226 1 C carbolate, c phenylate, c phenolate A pinkish powder, slightly soluble in water or alcohol, used as an antiseptic **c phenolsulfonate** $Ca(SO_2C_6H_4OH)_2$ = 354 4 C sulfophenate, c sulfocarbolate A white or faintly pink powder, soluble in water or alcohol, used as an intestinal antiseptic **c phosphate** There are

$CaHPO_4$	= dicalcium phosphate
$Ca(PO_3)_2$	= calcium metaphosphate
$CaH_4(PO_4)_2$	= monocalcium phosphate as salts of phosphoric acid
$Ca_2P_2O_7$	= calcium pyrophosphate
$Ca_3(PO_4)_2$	= tricalcium phosphate

The two last differ from calcium phosphite, being the salts of $H_4P_2O_7$ and HPO_3, respectively The naturally occurring phosphates and their mean indices of refraction, are

Monetite	$2CaO\,P_2O_5\,H_2O$	1 518
Brushite	$2CaO\,P_2O_5\,5H_2O$	1 545
Martinite	$5CaO\,2P_2O_5\,1\frac{1}{2}H_2O$	1 606
Isoclasite	$4CaO\,P_2O_5\,5H_2O$	1 568
Fluorapatite	$CaF_2\,9CaO\,3P_2O_5$	1 633
Chlorapatite	$CaCl_2\,9CaO\,3P_2O_5$	1 667
Podolite	$CaCO_3\,9CaO\,3P_2O_5$	1 635
Dahllite	$CaCO_3\,6CaO\,2P_2O_5$	1 633
Tiancolite	$CaCO_3\,CaF_2\,9CaO\,3P_2O_5\,H_2O$	1 625

(1) $CaHPO_4\,2H_2O$ = 172 1 (di-), secondary-dibasic-, diacid- Colorless monoclinic plates, $d_{15°}$ 2 3, slightly soluble in water, soluble in ammonium citrate solution or acids used medicinally in rachitis and in dentistry (2) $Ca(PO_3)_2$ = 198 0 (meta-) A white powder, insoluble in water or acids (3) $CaH_4(PO_4)_2\,H_2O$ = 252 1 (mono-), primary-, acid- Colorless rhombic crystals, $d_{4°}$ 2 0, becoming an-

hydrous on heating very soluble in water, soluble in acids Used in baking powders (4) $Ca_2P_2O_7\ 4H_2O$ = 328 3 (**pyro-**) Colorless crystals, slightly soluble in water, soluble in acids (5) $Ca_3(PO_4)_2\ H_2O$ = 328 3 (**tri-**), normal- tertiary-, neutral-, tribasic- A white powder, d 3 48, insoluble in water or alcohol, soluble in acids Used medicinally as a food for bone tissues, and in the manufacture of enamels, opaque glass cleansing agents, and phosphorus **c phosphide** (1) Ca_2P_2 = 142 0 A gray granular mass, decomp in water to form inflammable phosphine Used in torpedoes and in chemical warfare (2) Ca_3P_2 = 182 27 Tricalcium diphosphide Yields non-inflammable phosphine in water **c phosphite** $2CaHPO_3\ 3H_2O$ White crystals, slightly soluble in water decomp on heating forming PH_3 **c phthalate** $CaC_8H_4O_4\ H_2O$ = 222 1 Colorless prisms, soluble in water **c plumbate** $Ca(PbO_3)_2$ or Ca_2PbO_4 = 350 9 A brown or orange crystalline powder, insoluble in cold water decomp by CO_2 or hot water, and soluble in acids Used in the chemical industry as an oxidizing agent, in accumulators, in pyrotechnics as a substitute for potassium chlorate, and in the manufacture of glass and matches **c plumbite** $CaPbO_2$ = 278 9 Colorless crystals slightly soluble in water **c propionate** $Ca(C_3H_5O_2)_2$ = 186 1 A white powder, soluble in water **c pyrophosphate** See *c phosphate* (4) **c quinate** $CaC_{14}H_{22}O_{12}$ = 426 24 C chinate, $[C_6H_7(OH)_4COO]_2Ca$ **c rhodanide** C thiocyanate **c saccharate** Antacedin Colorless scales, soluble in water, used medicinally as an antiacid **c salicylate** $Ca(OOC\ C_6H_4\ OH)_2\ 2H_2O$ = 350 20 Colorless crystals, slightly soluble in water, soluble in carbonated water or acids **c santoninate** $Ca(C_{15}H_{19}O_4)_2$ = 566 39 A white crystalline powder, sparingly soluble in water, used as an anthelmintic **c selenate** $CaSeO_4$ = 183 1 White crystals, sparingly soluble in water **c selenite** $CaSeO_3\ 2H_2O$ = 219 30 A white powder soluble in water **c silicate** $CaSiO_3$ = 116 17 Okenite A white amorphous mass, insoluble in water or acids **c silicofluoride** Lapis albus **c silicotitanite** Sphene **c stearate** $Ca(C_{18}H_{35}O_2)_2$ = 606 6 A white granular powder, insoluble in water, soluble in alcohol **c suberate** $[(CH_2)_6(COO]_2Ca$ The c salt of suberic acid, it yields suberone on heating **c succinate** $CaC_4H_4O_4\ H_2O$ = 174 1 White crystals, soluble in water **c sulfate** (1) *anhydrite* $CaSO_4$ = 136 1 White rhombic crystals, d 2 96, m 1360, insoluble in water, soluble in ammonium salts, sodium thiosulfate and sodium chloride solutions, and acids Used as desiccant and absorbent, for drying gases and in air conditioning (2) *sesquihydrate* $CaSO_4\ \frac{1}{2}H_2O$ = 145 1 (**Plaster of paris**) A white powder containing 5 % water made by heating gypsum to 120–130°C It quickly solidifies when mixed with water, and is used for castings and taking moulds of objects, for architectural and art molding, ceramics and metal casting (3) *dihydrate* $CaSO_4\ 2H_2O$ = 172 1 (**Gypsum**) White monoclinic crystals, d 2 32 Used as a filler in paper (pearl hardening, mineral white), in making artificial ivory, as pigment, in fertilizers as a retarder in Portland cement and as a cleaning agent **c sulfide** CaS = 72 1 Hepar calcis, sulfurated lime A white, grayish or yellowish powder, $d_{15°}$ 2 8, used for luminous paints **c sulfite** $CaSO_3\ 2H_2O$ = 156 16 A white powder soluble in dilute H_2SO_3 Used as a disinfectant in breweries, as an antichlor in bleaching, and in manufacturing cellulose from wood **c sulfocarbolate** C phenolsulfonate **c sulfocyanide** C thiocyanate **c superoxide** C peroxide **c tannate** A yellowish-gray powder, insoluble in water, soluble in dilute acids **c tartrate** $CaC_4H_4O_6\ 4H_2O$ = 260 2 A white powder, sparingly soluble in water **c thiocyanate** $Ca(CNS)_2$ = 156 0 C rhodanide A white crystalline powder soluble in water used in analysis to dissolve silk from mixed textiles, and in medicine as vasodilator **c thiosulfate** $CaS_2O_3\ 6H_2O$ = 260 1 White rhombic crystals d 1 87 decomp in water and when heated **c tungstate** $CaWO_4$ = 288 0 C wolframate artificial scheelite Shining tetragonal scales or white powder, insoluble in water, used in luminous pigments and in X-ray screens **c urate** $Ca(C_5H_3O_3N_4)_2$ = 374 22 A white powder, sparingly soluble in water **c valerate** $Ca(C_5H_9O_2)_2\ 3H_2O$ = 296 28 A white crystalline powder soluble in water and used as a sedative **c wolframate** C tungstate

calcothar Colcothar

calcspar Calcite

calculator A device for rapid mathematical calculation See *nomogram*

calculus (1) The abnormal deposition of mineral salts, as, a stone-like concretion in an animal organism

biliary- Gallstones Solid deposits occurring either as (a) **cholesterol-**, consisting of cholesterol, (b) **pigment-**, consisting of bile pigments, bilirubin, and calcium salts (c) **inorganic-**, consisting of carbonates and phosphates of calcium

urinary- Urine concretions or concrements Solid masses of urinary sediment formed in the urinary tract (a) **uric acid-**, consist of uric acid and urates from pale yellow to brownish-red in color, (b) **phosphate-** consist of the triple phosphates, which are white, gray or yellowish, (c) **oxalate-** consist of calcium oxalate crystals

(2) The mathematical laws of continuously varying quantities, which can be graphically expressed in curves Cf *diagram*

calcyanide Calcium cyanide

Caldwell crucible An opaque, fused silica crucible having an open bottom with a flange to hold a platinum or porcelain disc

caledon A trade name for anthraquinone vat dyestuffs

caledonite A native basic lead and copper sulfate

calefacient A drug which is externally applied to induce a sense of warmth

calender A machine which presses moist cloth, paper, etc, between heavy rollers, and thus glazes its surface

calendula Marigold The flowering tops of *Calendula officinalis* Compositae, used as a tincture, as a stimulant

calendulin An amorphous substance from calendula

caleometer An electrical instrument which measures the heat loss of a coil of wire at constant temperature

calglucon Calcium gluconate

calgon Sodium hexametaphosphate, used to condition water

caliber, calibre The inside diameter or bore of a tube

calibration (1) The graduation of a measuring instrument, (2) the determination of its error

caliche Chile saltpeter A crude sodium nitrate found in the deserts of Atacama and Tarapaca (Northern Chile) It contains 20 to 50 per cent of sodium nitrate with sodium iodate

californite A massive variety of vesuvianite, resembling jade

calipers A device for measuring the diameter of a tube **micrometer-** An instrument for measuring with an accuracy up to $\frac{1}{100}$ mm **vernier-** A steel instrument for determining the inside or outside diameter of a tube

calisaya Cinchona

callaimite Turquoise

callaite Turquoise

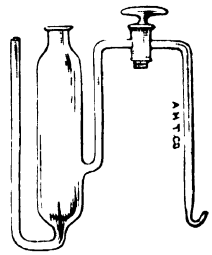
calliandrein A glucoside from *Calliandra grandiflora* a Leguminosae A white, odorless powder resembling saponin, used as an antipyretic

callicrein A circulatory hormone from the pancreas, not yet isolated

callitrol The alkali-soluble fraction b_{6mm} 118, from the wood oil of *Callitris glauca*, an Australian cypress yielding sandarac It contains chiefly *d*-citronellic acid

callitrolic acid $C_{64}H_{92}O_6(OH)COOH$ A resinous acid in sandarac

callophane A portable instrument for fluorescence analysis, q v , which utilizes daylight as the source of ultraviolet light



Calomel electrode (Hildebrand)

lmine Barbital sodium

calnitro A fertilizer made from NH_4NO_3 and $CaCO_3$ containing 16–20 % N

calomel (1) A native mercurous chloride of secondary origin (2) Mercurous chloride (pharmaceutical) **c electrode** A standard half-cell or electrode for measuring an e m f The potential is that of mercury and calomel in contact with a solution of potassium chloride

POTENTIALS OF STANDARD CALOMEL ELECTRODES (20°C)

Saturated potassium chloride	0 2492 volt
M/1 potassium chloride	0 2860
M/10 potassium chloride	0 3379

calorgas A mixture of hydrocarbons, e g C_4H_{10}, compressed in cylinders for heating and lighting purposes (heating value is 21 000 B Th U per pound) It is a by-product of coal hydrogenation

caloric The alchemical term for fire, which was supposed to possess weight

calorie A unit of quantity of heat The heat required to raise the temperature of 1 gram of water from t° to (t + 1)°C Hence the 15° cal , the 20° cal etc , where t = 15, 20 etc **gram-** Small c **great-** Large c **kilo-** Large c **large-** *Cal* or kilogram-calorie The heat required to raise the temperature of 1 kg water from 14 5° to 15 5°C

1 Cal = 1000 cal = 1000 gram-cal

mean- The $\frac{1}{100}$ part of the heat required to raise one gram water from 0°C to 100°C at atmospheric pressure **micro-** Small c **small-** *cal* or gram-calorie, therm The quantity of heat required to heat one gram water from 14 5°C to 15 5°C

At 18°C, 1 cal = 1 therm = 0 001 Cal = 4 183 Joules = 4 181 × 10^7 ergs = 3 086 foot pounds = 0 426 kg meters = 1 162 × 10^{-6} kilowatt-hours = 0 003968 B Th U

calorifacient A substance which produces warmth in the animal organism

calorific Carrying or holding warmth **c value** (1) Technical the number of large calories obtained by the combustion of fuels or gases (2) Physiological The number of small calories derived from foods or the daily diet

calorimeter An instrument for measuring the amount of heat liberated or absorbed **adiabatic-** A c kept at constant temperature **bomb-** A c in the form of an enclosed steel bomb, used for determination of the calorific power of fuels **Emerson-** A c for determining the heat value of fuels **Féry-** A c for determining the heat value of foods Cf *colorimeter*

calorimetric Pertaining to measuring heat quantities Cf *colorimetric*

calorimetry The measurement of heat Cf *colorimetry*

caloriscope A device for demonstrating the release of heat in the respiration of an organism

caloritropic Thermotropic

calorizing A process similar to sheradizing (q v) used for the production of aluminum coatings

calotropin A glucoside from *Calotropis procera* an Asclepiadaceae which has a like action digitalis, used by natives in arrow poisons Cf *akundarol*

columba Columba The root of *Jateorhiza calumba* (*J palmata*), a Menispermaceae of East Africa It is a bitter stomachic tonic **American c** Frasera

columbic acid Colombic acid An acid principle from calumba Cf *columbic acid*

columbin $C_{28}H_{30}O_8$ = 398 23 Columbin A glucoside from calumba Yellow crystals, m 182 slightly soluble in water, soluble in alcohol, used as bitter tonic

calx (1) Latin for lime or calcium oxide (2) The alchemical name for an oxide or dross

calycanthine $C_{11}H_{14}N_2 \frac{1}{2}H_2O$ = 183 2 An alkaloid from *Calycanthus fertilis* or Carolina allspice

calyxanthine Calycanthine

cambium A layer of growing tissue between the wood and bast of a tree

cambogia Gamboge

camboinic acid $C_{11}H_{15}O$ = 182 14 A crystalline acid from the resin of *Pinus cambodgiana*

camel's hair brush A small brush used in quantitative analysis for transferring precipitates, in microscopy for smoothing out tissues on slides

camelina The plant *C sativa*, a Cruciferae of the Mediterranean area which yields an oil, oil cake and fiber

camellin $C_{53}H_{84}O_{19}$ = 1024 81 A glucoside from the seeds of *Camellia japonica*, a Theaceae A reddish, bitter powder soluble in water, used as a cardiac stimulant

camenthol A mixture of camphor and menthol used for inhalation

camera (1) A light-proof box compartment or chamber (2) An optical device for taking photographs **ciné-** A c to take many individual exposures per second as,

ordinary	16 pictures p sec
ultrarapid	128 pictures p sec
chronoteine, q v	3200 pictures p sec

stereoscopic- A photographic camera for taking two pictures at a slightly different angle simultaneously, thus bringing out the depths or perspective of a scene Cf *binocular*

camera-lucida A prism-attachment fastened to the eye-piece of a microscope, which throws the image of the object in the field of the microscope on to drawing paper affixed to the table beside the artist who then traces it

camomile See *anthemis, calendula, chamomile, matricaria*

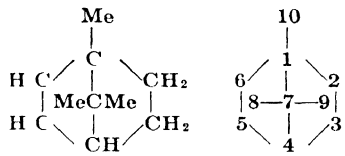
camouflet A space formed by an underground explosion and usually containing carbon monoxide

Camp colorimeter A pair of graduated glass tubes for comparing the colors of a standard and unknown solution, used in the determination of manganese in steel Cf *colorimeter* **C tube** A glass cylinder for the absorption of gases

Campden tablets A domestic preservative, containing sodium or potassium metabisulfite One tablet dissolved in 275 c c of water produces an approximately 0 1 % solution of SO_2

campeachy wood Logwood

camphane $C_{10}H_{18}$ = 138 2 1,7,7-trimethylnorcamphane The terpene hydrocarbon



White crystals, m 154, sublime at 160, soluble in alcohol **2-amino-** Bornyl amine **2-chloro-** Bornyl chloride **2 3-dihydroxy-** Camphene glycol **2-hydroxy-** Borneol **3-hydroxy-** Epiborneol **4-hydroxy-** Isoborneol **2-keto-** Camphor **3-keto-** Epicamphor

c carboxylic acid Camphocarboxylic acid

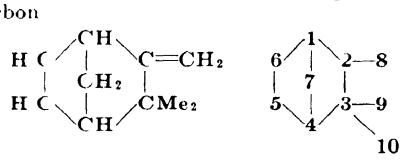
camphanic acid $C_{10}H_{14}O_4$ = 198 11 The lactone of α-hydroxy camphoric acid Colorless crystals, m 201

camphanol **2-** Borneol **3-** Epiborneol **4-** Isoborneol

camphanone **2-** Camphor **3-** Epicamphor

camphanyl The monovalent group $C_{10}H_{17}$—, derived from camphane

camphene $C_{10}H_{16}$ = 136 17 3,3-dimethyl-2-methylene-norcamphane The terpene hydrocarbon



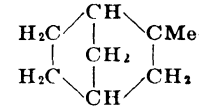
It occurs in three isomeric forms (a) **l-***Inactive-c* Colorless, fine needles, m 47, b 157, insoluble in water soluble in alcohol or ether (b) **d-***Dextro-c* Colorless needles, m 51, b 159, soluble in alcohol or ether (c) **l-***Levo-c* Colorless needles, m 52, b 159, soluble in alcohol or ether **chloro-** See *chlorocamphene* **sesqui-** See *sesquicamphene* **8-Δ1-pentenyl-** Sesquicamphene

c camphonic acid Camphoric acid

c glycol $C_{10}H_{18}O_2$ = 170 15, 2 3-dihydroxycamphane

camphenic acid $C_{10}H_{15}O_4$ = 199 1 3-carboxy-α-α-dimethylcyclopentane-acetic acid

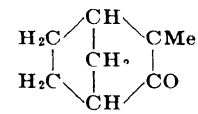
camphenilane C_9H_{16} = 124 2 2 2-dimethylnorcamphane The hydrocarbon



camphenilene The monovalent radical, C_9H_{15}—, derived from camphenilane

camphenilidene The bivalent radical, C_9H_{14}=, derived from camphenilane

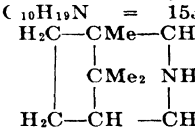
camphenilone $C_9H_{14}O$ = 138 17 3-keto-camphanilane The heterocyclic compound



*1-***methyl-** Camphenone

camphenone $C_{10}H_{16}O$ = 150 11 1-methyl-camphenilone Colorless crystals, m 168

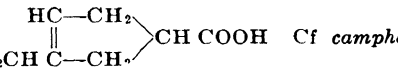
camphidine $C_{10}H_{19}N$ = 153 08 The ring structure



campho acid $C_{10}H_{14}O_6$ = 230 11 Carboxyl-apocamphoric acid Colorless crystals m 196

camphocarboxylic acid $C_{11}H_{16}O_3$ = 196 2 2-keto-3-carboxy-camphane Colorless crystals, soluble in water

camphoceenic acid $C_9H_{14}O_2$ = 154 1 3-isopropyl-Δ3-cyclopentene carboxylic acid



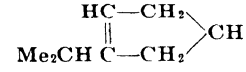
Cf *campholene*

camphogen Cymene

camphol Borneol

campholactone $C_9H_{14}O_2$ = 154 1 Colorless crystals, m 50

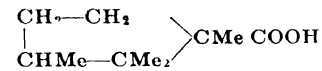
campholene C_8H_{14} = 110 1 3-Isopropyl-Δ3-cyclopentene The pentacyclic hydrocarbon



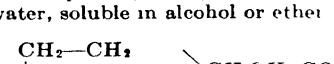
Cf *camphoceenic acid*

campholenic acid $C_{10}H_{16}O_2$ = 168 2 A colorless liquid, d 0 992, b 256

campholic acid $C_{10}H_{18}O_2$ = 170 2 1 2 2 3-tetramethyl cyclopentane carboxylic acid



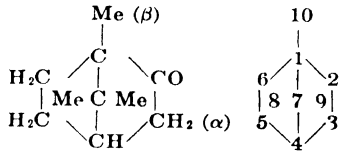
Colorless prisms, m 95, b 250, slightly soluble in water, soluble in alcohol or ether **iso-**



campholide $C_{10}H_{16}O_2$ = 168 2 White crystals, m 211

camphonanic acid $C_9H_{16}O_2$ = 156 2 1 2 2-trimethyl cyclopentane carboxylic acid Colorless crystals, soluble in alcohol

amphor (1) $C_{10}H_{16}O$ = 152 2 2-ketocamphane, *d-2-keto-1 7 7*-trimethylnorcamphane, 2-camphanone, Japan camphor, laurel camphor A stearoptene from the leaves of Laurus or *Cinnamomum camphora*, a small tree of Formosa, China, Japan and Malay Archipelago



Synthetic and natural camphor occurs in large crystalline plates, easily broken when moistened with ether, d 0 879, m 175, b 204, $[a]_D$ + 44°, soluble in alcohol or ether, insoluble in water Used medicinally as an antispasmodic stimulant sedative, carminative diaphoretic antiseptic, and in large quantities in the cellulose industry, and as plasticizer for synthetic resins Cf *menthol*, *thymol* (2) A group name for odorous principles of plants see *camphors* **alant-** Helenin **amido-** $C_{10}H_{17}ON$ = 167 2 A colorless oily liquid b 244 **anemone-** Anemonin **anise-** Anethole **artificial-** Terpene monochlorhydrate **asarum-** Asarone **azo-** $C_{10}H_{16}N_2O$ = 180 2 Monoketazocamphor quinone **beta-** Epicamphor **betula-** Betulinol **bitter almond-** Benzoin **Borneo-** Borneol **cantharides** Cantharidin **champaca-** Champacol **cyan-** $C_{11}H_{15}ON$ = 177 2 White crystals, m 127 **cyanmethylene-** $C_{12}H_{15}ON$ = 189 2 Colorless crystals, m 46, b 280 **dextro-** Camphor **diketo-** C quinone **elecampane-** Helenin **epi-** Epicamphor **iso-nitroso-** $C_{10}H_{15}O_2N$ = 181 12 Colorless crystals, m 153 **Japanese-** Camphor **keto-** Camphorquinone **laurel-** Camphor **ledum-** Ledum camphor **Malayan-** Borneol **oxymethylene-** $C_{11}H_{16}O_2$ = 180 2 White crystals m 77 **parsley-** Apiol **peppermint-** Menthol **pernitroso-** $C_{10}H_{16}O_2N_2$ = 197 2 White crystals, m 43 **pine-** Pinol **pulsatilla-** Anemonin **Sumatra-** Borneol **tar-** Naphthalene **Tonka-** Coumarin **thyme-** Thymol

c chlorated $C_{10}H_{15}OCl$ = 186 6 Monochlorated camphor A yellow crystalline powder, m 106, soluble in alcohol or ether Used as an antiseptic **c dibromated** $C_{10}H_{14}OBr_2$ = 310 2 A yellowish-white crystalline powder, m 115, soluble in alcohol or ether Used as an antiseptic **c imide** See *camphorimide* **c monobromated** $C_{10}H_{15}BrO$ = 231 2 Colorless crystals, m 76, b 274, soluble in alcohol or ether used extensively in medicine as an antispasmodic, antineuralgic and soporific in tablets, pills, or as solutions in oil **c oil** The essential oil distilled from the leaves of *Cinnamomum camphora* A colorless mobile liquid, d 0 87–1 04 of strong odor, used as an antiseptic and rubefacient **c wood oil** The oil distilled from the branches A yellow oil of strong odor, d 1 155, containing camphor safrol pinene phellandrene, cadinene Used as liniment for rheumatism, bruises and sprains See *antimalum*, *camphorated oil*

amphoramic acid $C_{10}H_{16}NO_3$ = 198 13 Camphoramidic acid camphoric acid-3-amide $C_8H_4Me_2(CONH_2)COOH$ White crystals α- m 177, β- m 182 5, soluble in water

camphoranic acid $C_9H_{14}O_6$ = 216 1 Colorless crystals, m 209

camphorated oil Camphor liniment A mixture of 1 pt camphor and 4 parts cottonseed or olive oil Used as rubefacient Cf *camphor wood oil*

camphoric acid $C_{10}H_{16}O_4$ = 200 2 cis-1 2 2-trimethyl-1 -3cyclopentane-dicarboxylic acid, $C_8H_{14}(COOH)_2$ A dibasic acid obtained by the oxidation of camphor Colorless, odorless prisms, d 1 193, m 187 decomp on further heating, soluble in 125 pts cold or 10 pts boiling water, slightly soluble in ether **c a amide** Camphoramic acid **c a diamide** $C_{10}H_{18}O_2N_2$ = 198 6 White crystals, m 197

camphorimide $C_{10}H_{15}O_2N$ = 181 2 Camphoric imide Colorless crystals m 248 b 300

camphormethylene carboxylic acid $C_{12}H_{16}O_3$ = 208 2 White crystals, m 101

camphormethylimide $C_{11}H_{17}O_2N$ = 195 2 White crystals, m 40

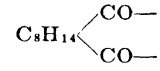
camphormethyl isoimide $C_{11}H_{17}O_2N$ = 195 2 White crystals, m 134

camphornitrilo acid $C_{10}H_{15}O_2N$ = 181 2 Cyanlauronic acid Colorless crystals, m 152

camphoronic acid $C_9H_{14}O_6$ = 218 1 α,α β-trimethyl-carballylic acid, *2 3*-dimethyl-*1 2 3*-butanetricarboxylic acid*, CH_2COOH-$CMeCOOH$ $CMeCOOH$ A tribasic acid formed by oxidation of camphoric acid, microcrystalline needles m 135

camphoroxime $C_{10}H_{17}ON$ = 167 2 Colorless needles, m 118, b 249, insoluble in water soluble in alcohol or ether

camphoroyl The bivalent radical, derived from



camphoric acid

camphorquinone $C_{10}H_{14}O_2$ = 166 2 3-ketocamphor or 2,3-di-ketocamphane

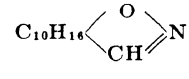
camphors A group of solid and volatile substances (stearoptenes), derived from certain plants, and composed of the keto- or alcohol-derivatives of terpenes, generally the odoriferous principle of the plant Cf *terpenes* Camphor, menthol, and thymol are official

camphoryl The monovalent radical, $C_{10}H_{15}O$— derived from camphor **c hydroxylamine** $C_{10}H_{15}O_3N$ = 197 1 Colorless crystals, m 225

camphorylidene The bivalent radical, $C_{10}H_{14}O$ =, derived from camphor

camphyl The bivalent radical $C_{10}H_{16}$ = derived from camphor **c alcohol** Borneol **c amine** $C_{10}H_{17}NH$ = 153 2 A solid, d_{17} 0 93 b 198

camphylisoxazolone $C_{11}H_{17}NO$ = 179 14 The compound,



camptonide A variety of diorite

camptonose A variety of basalt

camwood A red dye wood from *Baphia nitida* a Leguminosae of West Africa Cf *sandalwood*, *santalin*

canada asbestos Chrysotile **c balsam** A turpentine-like balsam exuded from incisions in the bark of *Abies balsamea*, a conifer of Canada and Maine It is a yellow liquid with a pleasant odor and bitter taste, and dries in air to a

transparent resin Hence its use to cement lenses together to mount microscopic specimens as a varnish and in medicine Its refractive index equals that of glass **c snakeroot** Asarum **c turpentine** The essential oil of *Pinus maritima* a Conifer

canadase Anorthosite from Maine

canadine $C_{20}H_{21}O_4N$ = 339 17 *l*-Tetrahydroberberine An alkaloid from the leaves of *Hydrastis canadensis* Silky needles m 133 insoluble in water

canadium A supposed new element of the platinum group

canadol Impure hexane C_6H_{14} obtained by the fractional distillation of petroleum and used medicinally as a local anesthetic in minor surgery

canaigre The roots of *Rumex hymenosepalus* a Polygonaceae of Texas and Mexico used for tanning (25–30 % tannin)

canal rays Positive rays The rays emerging behind the perforated cathode of a high vacuum tube which consist of positively charged molecules of gas They move from the anode with a velocity of about $3\ 2 \times 10^9$ cm /sec in the opposite direction to the cathode rays They carry a positive charge and cause strong ionization photographic action fluorescence and disintegration of certain substances They are used in positive-ray analysis (q v) Cf *rays* (figure) *mass spectra*

cananga Ylang ylang

canavalia bean The seeds of *Canavalia* species which are rich in urease

canavalin A globulin of the jack beans the seeds of *Canavalia* species Leguminosae of tropical countries

cancerine $C_8H_5O_3N$ = 163 1 A ptomaine found in pathological urine as colorless crystals

cancrinite $Na_4Al_3HCSi_4O_{15}$ A yellow hexagonal rock-forming mineral M W 511 5 d 2 4 M V 213 hardness 5 6

candelilla wax Gama wax A yellowish brown solid wax d 0 983 m 67–68 from the surface of the candelilla plant of Mexico used in candles cements polishes varnishes leather dressings and dentistry

candle A basic photometric unit *ca* of luminous intensity which is determined by international agreement and known as the international candle Cf *photometric units* **c balance** A balance for determining the rate per hour at which a candle burns **c nut oil** Lumbang oil **c power** The luminous intensity in terms of the candle the brightness of a standard candle 1 candle = 1 11 Hefner units = 0 104 carcel units 1 candle per cm^2 = 3 1416 lamberts = 3141 6 millilamberts 1 candle per in^2 = 0 4968 lamberts = 496 8 millilamberts **c standard** Candles made of sperm wax six to the pound which burn 120 grains of wax per hour See *standard candle foot candle meter candle*

canella Whitewood cinnamon bark The bark of *Winterana canella* a Canellaceae of the West Indies It is aromatic and used as a condiment **c oil** The essential oil of c Colorless liquid d 0 920–0 935 [a] + 1°8 and containing eugenol cineol and caryophyllin

cane sugar A sugar made from sugar cane and identical with sucrose (q v)

canfieldite Ag_8SnS A rare native silver and tin sulfide

cannabane $C_{18}H_{32}$ = 238 2 Cannabene hydride A volatile hydrocarbon in the essential oil of hemp Cf *cannibene*

cannabene $C_{18}H_{20}$ = 236 2 A hydrocarbon in oil of hemp

cannabin (1) A glucoside or (2) a resin from *Cannabis indica*

cannabine An alkaloid from cannabis used as a hypnotic

cannabinol $C_{21}H_{30}O_2$ = 314 3 A phenol aldehyde the active principle of *Cannabis sativa* A yellowish oil d 1 042 b_{100mm} 315 insoluble in water soluble in glacial acetic acid forming a fluorescent green and red coloured solution soluble in alcohol ether or chloroform **acetyl-** See *acetyl c*

cannabinone $C_{18}H_{10}O$ = 124 0 A ketone derived from cannabis

cannabis Indian hemp Indian c the flowering tops of the female plant of *C indica* or *C sativa* (hemp) an Urticaceae It is a narcotic See *bhang ganja hashish*

cannaboid The combined principles of *Cannabis indica* which are antispasmodic and sedative

cannel coal A compact and hard variety of bituminous coal which burns with a luminous flame Used for gas production Cf *boghead torbanite*

cannibene $C_{15}H_{24}$ = 204 19 A sesquiterpene d 0 897 b 259 from the essential oil of hemp Cf *cannabane*

cannizarization The treatment of aldehydes with alcoholic potash as Cannizzaro's reaction **C number** Cannizzaro number

Cannizzaro, Stanislao 1826–1910 An Italian chemist noted for his work on organic chemistry and the amplification and application of Avogadro's hypothesis to the atomic theory **C number** The number of milligrams KOH which react with 1 gm aldehyde according to C reaction **C reaction** The decomposition of aromatic aldehydes by alcoholic potash with the formation of corresponding acids and alcohols Thus benzaldehyde gives benzoic acid and benzyl alcohol

$$2RCHO + KOH \rightarrow R\,CH\,OH + R\,COOK$$

cannonite A high-explosive consisting of nitrocellulose and nitroglycerin

cannula A straight or U-shaped tube of glass or metal It is used in physiological experimentation for insertion into or connecting arteries

cantharene C_8H_{12} = 108 1 Dihydro-o-xylene A colorless liquid b 135

cantharides Blistering beetle canthanis Russian flies The Spanish fly *Lytta* or *Cantharis vesicatoria* used medicinally as a blistering agent **c camphor** *Sodium cantharidate*

cantharidic acid Cantharidin

cantharidin(e) $C_{10}H_{12}O_4$ = 196 1 2 3 Dimethyl-7-oxabicyclo [2 2 1] heptane-2 3-di-dicarboxylic anhydride The lactone of cantharidic acid obtained from various species of cantharis Colorless odorless glistening crystals slightly soluble in water m 210° used externally in blistering ointments and internally as a diuretic and stimulant

Cantharis A genus of beetles now *Lytta* Cf *cantharides*

Canton phosphorus A mixture of 2 parts oyster shells and 1 part sulfur said to be luminescent

canula Cannula

canvas A strong and closely-woven fabric of hemp or flax used in filterpresses and sacking

caoutchouc [From *caa o-chu*, Malayan "weeping tree," or from the sound of elastic] Rubber **Gaboon-** Dambonite **mineral-** q v **oil of-** Terpene

C A P Abbreviation for *chloracetophenone*

capacitance Electrostatic *capacity*

capacity (1) The ability to hold or contain a force or energy (2) Same as volume (3) The amount of matter, as compared with intensity Thus the c factor of acidity is *normality*, of *intensity* **electrostatic-** The amount of electricity required to raise a body to a given potential An isolated condenser has unit capacity when unit electrical quantity will charge it to unit potential The common units of capacity are (1) International farad—the c of a condenser charged to 1 volt by 1 coulomb (2) microfarad—the one millionth part of a farad **electromagnetic-** 10^9 Farads **heat-** Thermal c **specific inductive-** Dielectric constant **thermal-** Heat c The number of calories required to raise the temperature of an isolated body one degree centigrade

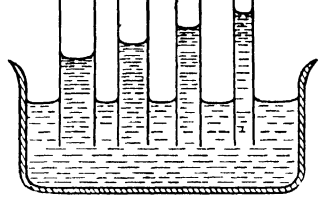
caparrosa The leaves of *Nea theifera*, a Nyctaginaceae of South America used as a tea

capers The green flowerbuds of *Capparis spinosa* a Capparidaceae of the Mediterranean, used pickled as a condiment

capillaries The network of delicate blood-vessels or other small connecting tubes of tissues

capillarity The attractive force between two unlike molecules as shown by the wetting of a solid surface by a liquid, or by meniscus formation

capillary Any tube with a very small inside diameter, or bore **c analysis** (1) The separation or identification of liquids or substances (e g drugs or dyes) in solution by observing the zones or colors produced when it is absorbed on a strip of filter paper which may be impregnated with a reagent or observed in ultra-violet light Cf *chromatographic analysis* (2) A filterpaper dipped into a *negative* colloid absorbs both, the dispersed and external phase but in a *positive* colloid only the external phase is absorbed Cf *adsorption* **c correction** A correction for the capillarity of mercury applied to mercury thermometers of diameters more than 25 mm **c electrode** See *Lippmann e* **c electrometer** See *electrometer* **c pipette** A pipette for measuring the fractional parts of a cc as, a blood pipette **c tubing** Glass tubing with an inside diameter of less than 1 mm



Capillarity

capillator An apparatus for the colorimetric determination of pH values in which the solutions are compared in capillary tubes The effect of any color or turbidity in the original solution is thereby much reduced

capnometry The measurement of the density of smoke Cf *nephelometry*

caporit A disinfectant mixture of $CaOCl_2$ and NaCl containing about 50 % active chlorine

capraldehyde $C_{10}H_{20}O$ = 156 15 Capric aldehyde decanal*, caprinaldehyde, n-decyl aldehyde Colorless liquid, d 0 828, b 209 2, from essential oils **iso-** A liquid, d 0 830, b 169 6 Cf *capryl aldehyde*

capramide (1) Caproyl amide (2) $C_{10}H_{21}NO$ = 171 17 Decanamide*, capric amide, n-decylic amide, $Me(CH_2)_8CONH_2$ White crystals, d - 0 999, m 108

caprate A salt of capric acid, containing the monovalent radical $C_9H_{19}COO$—

capric acid $C_{10}H_{20}O_2$ = 172 21 Octylacetic acid n-decoic acid, *n*-decanoic acid*, decylic acid, decatoic acid, $Me(CH_2)_8COOH$ A fatty acid in butter and other animal fats Colorless needles $d_{47°}$ 0 930, m 31, b 268, very slightly soluble in water, soluble in alcohol or ether Cf *rutic acid* **c aldehyde** Capraldehyde **c amide** Capramide **c anhydride** $C_{20}H_{38}O_3$ = 326 30 Decanoic anhydride*, *n*-decylic anhydride, $[Me(CH_2)_8CO]_2O$ White crystals, m 239, insoluble in water **c nitrile-** Caprinitrile

Caprifoliaceae Honeysuckle family A group of shrubs or twining plants, some of which yield drugs, as follows

flowers	
Sambucus canadensis	elder
bark	
Viburnum opulus	cramp bark
Viburnum prunifolium	black haw
roots	
Triosteum perfoliatum	fever root
fruits	
Lonicera xylosteum	xylostein

caprilic acid Caprylic acid

caprin A compound of capric acid and glycerin, *e g* tricaprin or glyceryl tricaprate dicaprin or glyceryl dicaprate

caprine Norleucine

caprinitrile $C_{10}H_{19}N$ = 153 16 Decane nitrile*, capric nitrile, *n*-nonyl cyanide, $Me(CH_2)_8CN$ A colorless liquid, d 0 8295, m −17 9 b 243 7, insoluble in water

caproaldehyde $C_6H_{12}O$ = 100 09 Hexanal*, *n*-caproic aldehyde, *n*-hexoic aldehyde, $Me(CH_2)_4CHO$ Colorless liquid d 0 8335, b 131

caproate A salt of caproic acid containing the monovalent radical, $C_5H_{11}COO$ — derived from caproic acid

caproic acid $C_6H_{12}O_2$ = 116 13 Butyl-acetic acid, *n*-hexoic acid hexanoic acid* *n*-hexylic acid, pentylformic acid, caproinic acid $Me(CH_2)_4COOH$ A fatty acid in animal fats A colorless liquid, $d_{29°}$ 0 929, m −5 2 b 205 7, slightly soluble in water, soluble in alcohol or ether Used in the manufacture of esters **α-amino-** Norleucine **α ε-diamino-** Lysine **α-hydroxy-** Leucinic acid **iso-** $Me_2CH(CH_2)_2COOH$ *i*-butylacetic acid dimethyl butyric acid A liquid, d 0 925, m −35, b 207 7 **γ-keto-** Homolevulinic acid **pseudo-** $MeCMe_2CH_2COOH$ *tert*- Butylacetic acid A liquid m −11, b 190 **secondary-** $Et_2CHCOOH$ Diethylacetic acid A liquid, d 0 933 m −15°C b 197 **secondary active-** $Me(CH_2)_2CHMeCOOH$ Methyl propyl acetic acid A liquid d 0 928 b 193 5 **tertiary-** $Me_2CEtCOOH$ Dimethylacetic acid A liquid, m −14°C, b 187

caproin A compound of glycerin and caproic acid, *e g*, tricaproin or glyceryl tricaproate, dicaproin or glyceryl dicaproate

caprokol $C_{12}H_{18}O_2$ = 194 2 *4*-Hexylresorcinol $C_6H_3(OH)_2C_6H_{13}$ Colorless crystals, used as a urinary antiseptic and said to have 45 times the germicidal power of phenol

caprone $C_{11}H_{22}O$ = 170 2 6-Hen-decanone* A volatile ketone from butter

capronic acid Caproic acid

capronitrile Amyl cyanide

capronium Ytterbium

capronyl The monovalent acid radical, C_5H_{11}-CO—, derived from caproic acid **c chloride** $C_6H_{11}OCl$ = 134 6 Caproic acid chloride A colorless liquid b 138

caprophyl Dung bacteria

caproyl The monovalent, acid radical, C_7H_{15}-CO—, derived from caprylic acid **c alcohol** Octyl alcohol **c aldehyde** Caprylaldehyde **c amide** $C_8H_{15}ONH_2$ = 143 2 Capramide, octylamide, octanamide* The compound $C_7H_{15}CO\,NH_2$ **c chloride** $C_8H_{15}OCl$ =162 57 The compound $C_7H_{15}COCl$ A colorless liquid, d 0 975, b 196

c acetate Octyl acetate

capryl Hexyl The monovalent hydrocarbon radical, C_6H_{13}—, derived from hexane **c alcohol** Hexyl alcohol **c amine** $C_6H_{13}NH_2$ = 101 1 Hexylamine A poisonous ptomaine from decomposed yeast or rancid animal oils **c hydride** Hexane

caprylate A salt of caprylic acid, it contains the monovalent radical, $C_7H_{15}COO$—

caprylene Octene

caprylic acid $C_8H_{16}O_2$ = 144 17 Hexylacetic acid *n*-octoic acid octylic acid octanoic acid* $Me(CH_2)_6COOH$ A fatty acid in butter Colorless leaflets, d 0 910, m 16, b 237 5, slightly soluble in water, soluble in alcohol or ether **iso-** CEt_3COOH Triethylacetic acid A solid, m 39 5 b 202 **c alcohol** Octyl alcohol **c aldehyde** $C_8H_{16}O$ = 128 12 Octanal*, capryl aldehyde $Me(CH_2)_6CHO$ A colorless liquid, d 0 821 b_{32mm} 81, in citron

caprylidene C_8H_{14} = 110 11 Octine *1*-octyne* *n*-hexylacetylene, $Me(CH_2)_5C{:}CH$ A liquid d 0 770, b 125

caprylin Any compound of glycerin and caprylic acid *e g*, tricaprylin or glyceryl tricaprylate, dicaprylin or glyceryl dicaprylate

capryryl Octanoyl* The radical $Me(CH_2)_6$-CO—, derived from caprylic acid **c chloride** $C_7H_{15}COCl$ = 162 57 Octanoyl chloride* A colorless liquid, d 0 9704 b 163

capsaicin $C_{18}H_{27}O_3N$ = 305 3 A bitter principle in 65, from capsicum Cf *zingerone*

capsanthin $C_{40}H_{58}O_3$ = 586 4 The red carotinoid (*q v*) pigment of paprika, *Capsicum annuum*, in 175

capsanthol $C_{40}H_{57}(OH)_3$ = 588 46 A reduction product in 175, of capsanthin

capsic acid An active principle of pimenta

capsicin An oleoresin from capsicum Thick, reddish-brown masses, soluble in alcohol or ether used as a stimulant, anodyne, and rubefacient

capsicine An alkaloid from capsicum

capsicol The essential oil of capsicum

capsicum Cayenne pepper, chile, chilli, pepper red The dried unripe fruits of *Capsicum fastigiatum C annuum* and other Solanaceae used medicinally as a local stimulant, and as condiment for tomato sauce, etc Cf *paprika*

c resin An oleoresin from *Capsicum*, used as circulatory stimulant and heart tonic

capsularin $C_{12}H_{16}O_5$ = 428 3 A glucoside found in jute leaf, *Corchorus capsularis*, a Tiliaceae, colorless needles m 175

capsule (1) A small membranous sac inclosing a structural part of an organism (2) A small sealed container for volatile compounds

capsuloesic acid Aescinic acid

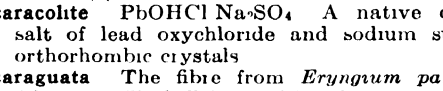
caput Pl *capita* A head **c mortuum** (1) The name given by early chemists to an earthy residue obtained after distillation or incineration (2) Calcothar

caracolite $PbOHCl\,Na_2SO_4$ A native double salt of lead oxychloride and sodium sulfate, orthorhombic crystals

caraguata The fibre from *Eryngium pandanifolium*, an Umbelliferae of South America, used for ropes, matting and bags

carajura A red pigment from *Begonia chica* It contains wax, colored resin, silica and salts of Ca, Mg, and K, and is a source of carajurin

carajurin $C_{17}H_{14}O_5$ = 298 11



The principal colored constituent of carajura

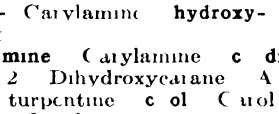
carajutin $C_{15}H_{10}O_5$ = 270 08 A derivative of carajurin scarlet needles

caramel $(C_{12}H_{18}O_9)_x$ A compound obtained by heating sugar to about 200, often in presence of ammonium salts A black or brown soluble mass, used as coloring matter for food, beverages and beer

caramelan A brown amorphous constituent of caramel It forms soluble salts with lead and alkalis, is hydrolyzed by dilute acids to dextrose, furfural and levulic acid, and reduces Fehling's solution

carana Mararo, caranna, gum carana A dark gray, brittle, resinous substance from *Urotium carana* a Rutaceae of South America and Mexico

carane $C_{10}H_{18}$ = 138 2 3 7 7-trimethyl-bicyclo(0 1 4)heptane The hydrocarbon



A constituent of essential oils Δ^3- Carene **amino-** Carylamine **hydroxy-** Carol **keto-** Carone

c amine Carylamine **c diol** $C_{10}H_{18}O_2$ = 170 2 Dihydroxycarane A constituent of Indian turpentine **c ol** Carol

caraneol Carol

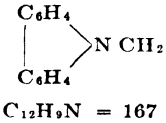
caranna Carana

carase Papain

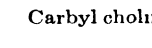
carat A unit of weight of diamonds, precious stones and the fineness of gold Standard of pure gold is 24 carats, *e g* 15 c gold contains 9 parts of a base metal *i e*, 37 5 % of gold 1 carat = 205 mg or 3 163 troy grains **English-** 3 1683 grams = 205 31 mg Defined by the British Board of Trade in 1888 **metric-** 200 000 mg = 3 086 grains It became compulsory in the United Kingdom in 1914 Cf *carob bean*

caraway The fruits of *Carum carvi* an Umbelliferae, used as an aromatic stimulant and flavoring agent **c oil** The essential oil of c seeds d 0 907 0 915, b 180–230 containing carvone and *d*-limonene, used for flavoring **c water** Aqua carum Water flavored with c oil

carbachol Chloryl, moryl Carbyl choline chloride
carbacidometer Air tester
carbagel Calcium chloride on porous carbon, used for dehydration
carbamamidine Guanidine
carbamase An enzyme, splitting proteins to amines
carbamate A salt of carbamic acid, it contains the monovalent NH_2COO— radical **ethyl-** Urethane
carbamic The divalent radical, —NH COO—, derived from carbamic acid, as Ph NHCOO Ph, phenylcarbamic-phenyl ester
carbamic acid NH_2COOH Amidocarbonic acid, aminoformic acid The theoretical, first and simplest aminoacid, known as a number of salts, carbamates Cf *thionamic acid* **amino-** Carbazic acid **carbamyl-** Allophanic acid **cyano-** See *cyano c* **dithio-** See *dithio c* **nitro-** See *nitro c* **phenyl-** Carbanilic acid
carbamide An isomer of urea, q v **c chloride** Carbamyl chloride
carbamidine Guanidine
carbamido Uramido, uramino The monovalent radical, NH_2CONH—, derived from urea **phenyl-** The radical PhNH CO NH—
carbaminate Carbamate
carbamonitrile Cyanamide
carbamyl The monovalent radical, NH_2CO—, derived from carbamic acid **c carbamic acid** Allophanic acid **c chloride** NH_2COCl = 79 48 Carbamide chloride Colorless needles, m 50 b 60, insoluble in water or alcohol Used in organic synthesis Cf *Friedel-Craft reaction* **c cyanide** Oxamonitrile
carbamylic ester Phenyl urethane
carbanil Phenyl cyanate **c aldehyde** Formanilide
carbanilic acid $C_7H_7O_2N$ = 137 06 Phenylcarbamic acid, Ph NH COOH
carbanilide $C_{13}H_{12}ON_2$ = 212 25 Diphenylurea, PhNH CO NHPh Colorless needles m 236, slightly soluble in water, soluble in alcohol or ether
carbanilino- Phenylcarbamyl A prefix indicating the radical PhNHCO—
carbanilo- A prefix indicating the radical, Ph NH— **c nitrile** Cyanoanilide
carbanion Carbonate ion, CO_3^{--}
carbarsone $C_7H_9N_2O_4As$ = 260 05 *N*-Carbamyl arsanilic acid, *p*-carbaminophenyl-arsonic acid A white powder, insoluble in water, soluble in carbonate solutions, used as an amebicide Cf *tryparsamide, acetarsone*
carbazic acid $CH_4O_2N_2$ = 76 03 Aminocarbamic acid, hydrazine carboxylic acid, hydrazinoformic acid NH_2 NH COOH
carbazide A compound containing the divalent —NH NH CO NH NH— radical **semi-** A compound containing the monovalent NH_2-CO NH NH — radical **sulfo-** A compound containing the divalent —NH NH CS NH-NH— radical **sulfosemi-** A compound containing the monovalent NH_2CS NH NH— radical Cf *carbohydrazide*
carbazolacetic acid $C_{14}H_{11}O_2N$ = 224 1



carbazole $C_{12}H_9N$ = 167 1 Dibenzopyrrole, diphenylenimide The heterocyclic system,



Colorless crystals, m 245, b 351, used as a stabilizer for explosives **acetyl-** See *acetyl c* **N-ethyl-** $C_{14}H_{14}N$ = 196 2 Colorless crystals, m 68 **hexahydro-** $C_{12}H_{15}N$ = 173 2 Colorless crystals, m 99, b 267 **N-methyl-** $C_{13}H_{12}N$ = 182 1 Colorless crystals, m 87 **naphthopheno-** See *naphthophenocarbazole* **tetrahydro-** $C_{12}H_{13}N$ = 171 12 Colorless crystals m 119
carbazone A compound containing the divalent —N N CO NH NH— radical (See *carbodiazone*) **sulfo-** A compound containing the divalent —N N CS NH NH— radical
carbazotate Picrate
carbazyl The monovalent radical, $C_{12}H_8N$—, derived from carbazole, it forms 5 isomers
carbazylic acid An organic acid of the type R—C(NH)NH_2 Cf *carbylic acid*
carbene Cuprene
carbenes Constituents of bitumen which are insoluble in carbon tetrachloride or chloroform, but soluble in carbon disulfide Cf *asphaltheneS*
carbenzol A distillate from shale tar containing phenols, used medicinally in skin diseases
carbethoxy The monovalent radical, —COOEt Cf *carbomethoxy*
carbethylic acid Ethyl carbonate
carbide Carbonide, carburet (cf *acetylide*) A binary carbon compound of a metal Some carbides decompose readily in water and give acetylene (Li_4C, K_4C, CaC_2, SiC_2, BaC_2), others form methane (Al_4C_3, B_2C), or hydrogen and methane (MgC_2, Mn_3C, Cr_3C), or a mixture of hydrogen, methane and acetylene (rare earth carbides), while those of the rare metals (ThC_2 U_2C_3) form solid liquid or gaseous hydrocarbons and some carbides (as SiC Ti_xC_y) are extremely stable Cf *crystolon carboly*
carbimide Isocyanic acid
carbinol (1) The monovalent radical, —CH_2OH characteristic of primary alcohols Cf *carbinols* (2) Methanol (3) Acetyl methyl carbinol, occurring in butter and responsible for its flavor and aroma **acetyl-** Acetol **allyl-** Δ^3-1-Butenol **anthryl-** Anthracene carbinol **benzyl-** Phenethyl alcohol **butyl-** primary-Amyl alcohol, secondary- 2-Methyl-1-butanol, tertiary- 2-Dimethylpropanol **diethyl-** 3-Pentanol **dimethyl-** Secondary- *propanol* **diphenyl-** Benzohydrol **ethyl-** Propanol **hexamethyl-** 2-Octanol **methyl-** Ethanol **phenyl-** Benzylalcohol **propyl-** n-Butyl alcohol, n-butanol **triethyl-** 3-Ethyl-3-pentanol **trimethyl-** Tert-*Butyl alcohol* (tert butanol)
carbinols Primary alcohols An aliphatic or aromatic compound of the general formula R CH_2 OH, as

methylcarbinol	Me CH_2OH
ethylcarbinol	Et CH_2OH
propylcarbinol	Pr CH_2OH
phenylcarbinol	Ph CH_2OH

carbitol $C_6H_{14}O_3$ = 134 11 Diethyleneglycol ethylether, $EtO(CH_2)_2O(CH_2)_2OH$ A colorless, volatile liquid, d 1 132, b 195, soluble in water, alcohol or ether Used as a solvent for resins and nitrocellulose, in lacquer manufacture, in cosmetics and shaving cream **butyl-** $C_8H_{18}O_3$ = 162 2 Diethyleneglycol-butylether, $BuOCH_2OCH_2CH_2OH$ A colorless, volatile liquid, b 222, used as a solvent in the manufacture of lacquers

carbo Charcoal **c animalis** A charcoal prepared from bones and other animal matter, used as a decolorizing agent **c lignius** A charcoal prepared from wood (wood charcoal) Used for decolorizing solutions and in blowpipe analysis **c sanguinarius** Blood coal Charcoal prepared from animal blood

carbobenzoyl A compound containing the monovalent radical, —CO C_6H_4 COOH **c formic acid** Phthalonic acid **c acetic acid** Colorless, m 90 **c propionic acid** Colorless, m 137

carbocinchomeronic acid Cinchomeronic acid

carbocyanine A group of dyes used as photographic sensitizers, *e g* , pinacyanol, sensitol-red Cf *cyanine, isocyanine pseudocyanine*

carbocyclic A homocyclic compound of carbon, or an organic ring-compound in which all the ring atoms are carbon (*e g* , benzene) as opposed to heterocyclic compounds

carbodiazone A compound containing the divalent —N N CO N N— radical **sulfo-** A compound containing the divalent —N N CS - N N— radical

carbofrax A refractory material consisting of silicon carbide, bonded together by varying amounts of refractory clays or other ceramics

carbohydrase A member of a class of hydrolytic enzymes (q v) which split carbohydrates

carbohydrates Organic compounds which are synthesized by plants and contain C, H, and O, the latter two in the proportion of water Their general formula is $C_x(H_2O)_y$

Monosaccharides x and y are 2 3, 4, 5, 6, or 7
Disaccharides, x is 12, y is 11
Trisaccharides x is 18 y is 16
Polysaccharides x and y are integers greater than 18
Natural c are generally dextorotatory, except fructose and inosite

CARBOHYDRATES

I	*Monosaccharides*	
1	Bioses	$C_2H_4O_2$
a	aldoses—glycoaldehyde	
b	ketoses—none	
2	Trioses	$C_3H_6O_3$
a	aldoses—glycerose	
b	ketoses—dioxyacetone	
3	Tetroses	$C_4H_8O_4$
a	aldoses—erythrose	
b	ketoses—erythrulose	
4	Pentoses	$C_5H_{10}O_5$
a	aldoses—arabinose, xylose, ribose	
b	ketoses—arabinulose	
5	Hexoses	$C_6H_{12}O_6$
a	aldoses—dextrose, galactose, mannose	
b	ketoses—levulose, sorbose	
6	Heptoses	$C_7H_{14}O_7$
a	aldoses—mannoheptose	
II	*Disaccharides*	$C_{12}H_{22}O_{11}$
1	Lactose (milk sugar)	
2	Maltose (malt sugar)	
3	Sucrose (cane sugar)	
4	Melibiose	
5	Trehalose	
III	*Trisaccharides*	$C_{18}H_{32}O_{16}$
1	Raffinose	
2	Melezitose	
IV	*Tetrasaccharides*	$C_{24}H_{42}O_{21}$
1	Lupeose	
2	Stachyose	
V	*Polysaccharides*	$C_x(H_2O)_{x-1}$
1	Dextrins	
a	achroodextrins	
b	erythrodextrins	
2	Starch group	
a	starches	
b	inulins	
c	glycogens	
d	lichenins	
3	Cellulose group	
a	Celluloses	
b	hemicelluloses	
1	pentosans—gum arabic	
2	hexosans—galactans, agar-agar	
VI	*Conjugated Saccharides*	
1	Gums and mucilage group Consisting of saccharides and acids	
2	Glucosides, q v Consisting of saccharides and some other compound	
3	Tannins, q v Consisting of saccharides and tannins	

carbohydrazide CH_6ON_4 = 90 08 Carbazide (q v), *s*-diaminourea, NH_2 NH CO NH NH_2

carbohydrazidine See *oxidiamide dihydrazide*

carbohydrazones Carbazides

carbohydride Hydrocarbon

carboids Kerotenes

carbolate Phenate An ester of "carbolic" acid (phenol), hence a compound containing the monovalent PhO—radical

carbolfuchsin Ziehl's stain A staining solution containing 5 pts fuchsin, 25 pts phenol, 50 pts alcohol, and 500 pts water

carbolic acid Phenol **c liquid** Cresylic acid **c oil** The fraction of coal tar, b 180–230, it is rich in phenols

carbolmethyl violet A microscope staining solution made by mixing 10 pts of an alcoholic solution of methyl violet 6B with 90 pts of a 5 % aqueous phenol solution

carbolon A trade name for *silicon carbide*

carboloy A trade mark for cemented *tungsten carbide*, which is used for high-speed machine tools and is second in hardness to diamond

carbolxylene A microscope clearing solution, made by mixing 3 pts xylene and 1 pt phenol

carbometer A device for measuring the amount of carbon dioxide in air

carbomethene Ketene

carbomethoxy The monovalent radical, —COOMe Cf *carbethoxy*

carbon C = 12 010 Atomic number, 6 A non-metallic bio-element which exists in three allotropic forms amorphous (coal), graphite and crystalline (diamond) It occurs native as coal, graphite and diamond, in combination with hydrogen as petroleum, with oxygen as carbon dioxide It is an essential element for all vegetable and animal life Its principal valency is four but a few compounds of mono-, di-, and tri-valent carbon have been prepared The main characteristic of carbon is that its atoms have a greater affinity for one another than for other atoms, thus the carbon atoms link with one another in endless variety and give rise to thousands of different (organic) compounds This behavior of the carbon atom is due to its valency of four, and as eight electrons are neces-

sary for a stable system, the carbon atoms may be weakly positive or weakly negative and form non-polar compounds The binary compounds of carbon are

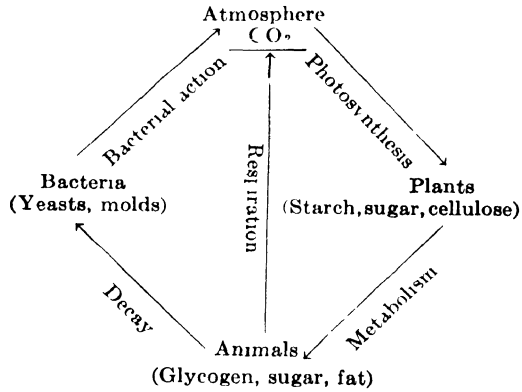
carbides	M_xC_y
hydrocarbons	C_xH_y
carbon-x-ides	C_xX_y
carbonyls	CO^-

Cf *active c , gas c , charcoal, graphite diamond, lampblack electrode*

c apparatus An instrument for determining the total carbon in coal, coke, and other fuels **c atom** Tetrahedronal c *asymmetric-* C linked to four different types of atoms or radicals *primary-* C having one bond satisfied by carbon, *e g* , at the end of a chain *quaternary-* C surrounded by four carbon atoms *secondary-* C linked to two c atoms *tertiary-* C linked to three c atoms **c bisulfide** C disulfide **c black** Lamp black **c bond** The non-polar linkage between two carbon atoms, A and B, which consists of a pair of electrons at equal or unequal distances from each carbon atom It may be electrically neutral, as in (1), or negative (B in *2*), or positive (B in *3*),

(1) A B or A−−B or A−o—B
(2) A B or A+−B or A—o-B
(3) A B or A−+B or A-o—B

c bronze An alloy for bearings **c chains** The successive arrangement of linked carbon atoms in a compound (**closed-**) Aromatic compounds, (**open-**) Aliphatic compounds **c compounds** See *organic compounds* The characteristics of carbon compounds are (1) non-polarity, they do not ionize, and since their reactions are molecular and not ionic, they have a low velocity and can be controlled by temperature, (2) polymerism, the combination of similar molecules to larger and complex molecules, (3) isomerism and asymmetry, (q v), (4) combustibility, on heating, all carbon atoms oxidized to carbon dioxide and other reaction products **c cycle** The circulation of carbon between a living organism and the surrounding environment as illustrated by the diagram



c dichloride C_2Cl_4 = 165 84 Ethylene perchloride A colorless liquid, $d_{20°}$ 1 619, b 122 **c dioxide** CO_2 = 44 01 Carbonic acid gas, carbonic anhydride A heavy, colorless incombustible gas, d_{air} 1 53, m −65, b $_{5\ 3atm}$ −56, soluble in water slightly soluble in alcohol It is shipped as compressed liquid in steel tanks, and is used extensively in many industries, viz for carbonating beverages, in refrigerators and fire extinguishers, for destruction of vermin and as a fertilizer **c disulfide** CS_2 = 76 13 A colorless refractive liquid with a characteristic odor, $d_{22°}$ 1 256, m −112 b 46 2, nearly insoluble in water, soluble in alcohol or ether Used medicinally as a local anesthetic and counter-irritant, in organic synthesis as a reagent, and as a solvent for S, I, rubber, etc **c group** The fourth group of the periodic system (q v) **c hexachloride** C_2Cl_6 = 236 77 Carbon trichloride ethyl perchloride, hexachloroethane Colorless crystals $d_{20°}$ 1 99, m 182, b 187, insoluble in water, soluble in alcohol or ether **c light** An electric arc light with C electrodes **c monosulfide** CS = 44 04 A colorless gas, b −130, very unstable and polymerizes to a red solid **c monoxide** CO = 28 01 A colorless poisonous gas, d_{air} 0 967, m −205 7, b −190, slightly soluble in water It is formed during incomplete combustion of C **c oxysulfide** COS = 60 07 Carbonyl sulfide A colorless gas, d_{air} 2 104 m −138 2 b 50 2 slightly soluble in water mixed with air it is explosive **c paper** A tissue paper coated with a mixture of grease lampblack, and used to make copies of writings typings or drawings **c print** A photographic process of making artistic reproductions of negatives **c residue** Conradson carbon The %C produced from a lubricating oil heated in a closed crucible under definite conditions **c subnitride** Acetylene dinitrile **c suboxide** C_3O = 68 02 A colorless gas d_{air} 1 11 m −107 b 7, decomp by water soluble in ether It is considered to be

C=C=C—O or O C C C O
└—O—┘

(*Michael's formula*) (*Diehl's formula*)

It has a pungent odor, and is lachrimatory and suffocating With water it forms malonic acid **c subsulfide** C_3S_2 = 100 0 A deep red liquid, m −0 5, pungent odor, it polymerises on heating **c tetrabromide** CBr_4 = 331 85 Tetrabromomethane* Colorless scales, d 3 42 m 92, b 189, insoluble in water, soluble in alcohol or ether **c tetrachloride** CCl_4 = 153 84 Tetrachloromethane*, phenoxin, pyrex, A colorless liquid, $d_{5°}$ 1 584, m −19 5, b 76, slightly soluble in water, miscible with alcohol or ether Used as a local anesthetic, and fire extinguisher, as a non-flammable solvent for resins, rubber, oils, etc , as cleaning agent, to replace benzene, and in organic synthesis as a reagent **c tetrafluoride** CF_4 = 88 0 Tetrafluoromethane*, fluoromethane A colorless gas, b −126, formed as by-product in the manufacture of aluminum from cryolite **c tetraiodide** CI_4 = 519 84 Tetraiodomethane* Red crystals, $d_{20°}$ 4 32, decomp on heating, insoluble in water, soluble in alcohol or ether **c trichloride** Hexachloroethane

carbonaceous Containing carbon

carbonado Bort A hard, black diamond, used for cutting purposes

carbonatation The formation of carbonates by the action of carbon dioxide, wrongly known as *carbonation*

carbonate A salt of the theoretical carbonic acid containing the divalent CO =radical

All carbonates are readily decomposed by acids The carbonates of the alkali metals are soluble, all others are insoluble **bi-** A salt containing the monovalent HCO_3— radical they are also termed acid carbonates **chloro-** See *chlorocarbonate*

c minerals A group of rock-forming minerals, as

calcite	$CaCO_3$
aragonite	$CaCO_3$
dolomite	$CaMg(CO_3)_2$
magnesite	$MgCO_3$
siderite	$FeCO_3$

carbonation (**1**) Carbonization (**2**) The precipitation of lime by carbon dioxide *e g* , in sugar refineries (**3**) The saturation of water with carbon dioxide *e g* , in soda water manufacture, this is more properly known as *carbonatation* (q v)

carbonic A compound containing tetravalent carbon Cf *carbonium*

carbonic acid (1) H_2CO_3 Meta-carbonic acid, hydroxyformic acid $CO(OH)_2$ or HO COOH The hypothetical acid of carbon dioxide and water, known only in the form of its salts (carbonates) and acid salts (bicarbonates), as amides (carbamic acid, urea), and acid chlorides (carbonyl chloride) (2) An old term for carboxylic acid **c acid hydrate** The compound $CO_2 6H_2O$ **ortho-** The compound $C(OH)_4$ It does not exist in the free state, though its esters are known

carbonic acid esters An organic compound in which the H of carbonic acid is substituted by a radical **meta-** Compounds of the general formula RO CO OR **ortho-** Compounds of the general formula, $C(OR)_4$

carbonic anhydride Carbonic acid

carbonic ester Carbonic acid ester **ethyl-** $CO(OEt)_2$ = 118 1 A colorless liquid, b 126 **ethylene-** $CO(OC_2H_3)_2$ = 114 1 Colorless crystals, m 39 b 236 **methyl-** $CO(OMe)_2$ = 90 1 A colorless liquid, b 91 **methylethyl-** EtO CO OMe = 104 1 A colorless liquid, b 109 **methylpropyl-** PrO CO OMe = 118 1 A colorless liquid, b 131

carbonic ether Ethyl carbonate

carbonide Carbide

carboniferous (1) Containing carbon (2) Belonging to the coal-age, see *geologic era*

carbonite (1) Small charcoal briquettes See *briquet* (2) A high-explosive consisting of 17–30 % nitroglycerin, 24–30 % $NaNO_3$ and 37–44 % flour

carbonitrile Cyanide, nitrile The radical —CN indicated by the *prefix* cyano- or the *suffix* nitrile or carbonitrile

carbonium A compound with divalent or trivalent carbon, hence the condition in which a carbon atom has temporarily a quartet or sextet of electrons This exceptional structure has been held responsible for the presence of color and reactivity

carbonization (1) The transformation of organic matter into charcoal (2) The distillation of coal, as in gas and coke manufacture **high temperature-** Heating coal out of contact with air in a gas oven or coke oven to 1000–1300°C, with the formation of gas, tar, oil, ammonia and coke **low temperature-** Heating of coal to 450–700°C, with the formation of gas, petroleum (hydrocarbons from pentane to octane, and amylene to octene) and coke

carbonize To convert to carbon, to char or to burn incompletely

carbonizer A concentrated aluminum chloride solution used in the textile industry to remove cellulose from wool

carbonoid A tetragonal form suggested for the structure of carbon, which has four equal faces, each of which corresponds with one valency Cf *benzenoid*

carbonometer A device for determining the carbonic acid content of blood Cf *carbometer*

carbonoxysulfide Carbon oxysulfide

carbon rheostat An electric resistance consisting of a number of carbon plates mounted between castings on a base of asbestos and wood in such a way that pressure can be placed on the plates by means of a screw and their total resistance thus altered

carbonyl The divalent =CO radical Cf *carbonyles, thionyl* **c amido phenol** Oxybenzoazole **c bromide** $COBr_2$ = 187 83 Bromophosgene A poisonous liquid, d 2 44 b 64 5 **c chloride** $COCl_2$ = 98 92 Phosgene A poisonous gas, m —75 b 8 2, decomp in water or alcohol, used in organic synthesis, and gas warfare **c dioxy** The bivalent radical —O - CO O— **c hemoglobin** A combination of CO and hemoglobin which is highly poisonous **c pyrrole** $CO(C_4H_4N)_2$ = 160 1 Colorless crystals, m 0 63, b 238 **c sulfide** Carbon oxysulfide **c thiocarbonanilide** $C_2ON_2SPh_2$ = 254 1 Colorless crystals, m 87 **thio-c thiocarboanilide** $C_2N_2S_2Ph_2$ = 270 1 Colorless crystals, m 79

carbonyles Carboxides A group of compounds of carbon monoxide and metals, some of them volatile, as, nickel carbonyl, $Ni(CO)_4$

carboraffin An activated charcoal used chiefly for decolorizing sugar solutions

carborundum A registered trade name for silicon carbide

carbosant $C_{31}H_{46}O_3$ = 466 37 Santalyl carbonate, $(C_{15}H_{23})O COO(C_{15}H_{23})$ Carbonic acid ester of sandalwood oil An oily yellow liquid, nearly tasteless and odorless insoluble in water, soluble in alcohol, ether or chloroform

carbostyril C_9H_7ON = 145 15 2-hydroxyquinoline, 2-quinolinol, α-oxyquinoline, 2(1)-quinol-one Colorless prisms, m 199, slightly soluble in water, soluble in alcohol or ether **ethyl-** See *ethyl c* **hydro-** C_9H_9ON = 147 15 Colorless crystals m 163 **hydroiso-** C_9H_9ON = 147 15 Crystals, m 71 **iso-** C_9H_7ON = 145 15 Crystals, m 208 **methyl-** Lepidone **nitro-** $C_9H_6O_3N_2$ = 190 2 Colorless crystals, m 168 **octohydro-** $C_9H_{15}ON$ = 153 19 Crystals, m 151 **oxy-** $C_9H_7O_2N$ = 161 16 Colorless crystals, m 300 **pseudo-** C_9H_7ON = 145 15

carbostyrilic acid Kynuric acid

carbox metal An alloy of 84 % Pb, 14 % Sb, 1 % Fe and 1 % Zn

carboxide (1) Same as carbonyl (2) The keto group (3) A mixture of 1 pt ethylene oxide and 9 pts CO_2, used as fumigant for destruction of insects in grain, foodstuffs, tobacco, etc

carboxy Carboxyl

carboxyhemoglobin A compound of carbon monoxide and hemoglobin formed in the blood after carbon monoxide poisoning

carboxyl Oxatyl, carboxy The monovalent acidic —COOH group The basic capacity of an organic acid is dependent on the number of carboxyl groups present *E g* , acetic acid is

mono-basic, oxalic acid is dibasic, citric acid is tribasic, as they contain respectively one, two, or three c radicals **c nitrogen** See *nitrogen*

carboxylase An enzyme in yeast, which splits the carboxyl group into CO_2 **co-** Vitamin B_1 pyrophosphate

carboxylic acid A compound of the type R—COOH See *acids* Its nitrogen analog is *carbazylic* acid Cf *carbylic acid*

carboy Demijohn A large glass flask protected by wicker work or a wooden box, holding 10–13 gallons and used for the transport of acids, etc **c inclinator** A support for a c , enabling it to be inclined and emptied easily

carbro process A method of making color-prints from color-photographs, similar to the ozobrom process

carbromal Adalin

carbrosolide A trade name for silicon carbide

carburation (1) Carbonization as applied to internal combustion engines (2) *Carburization*

carburet Carbide

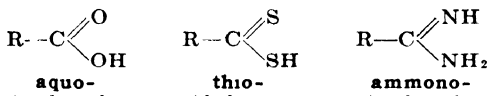
carburettor (1) A device for making illuminating gas from water gas by spraying oil on hot surfaces over which the water gas passes (2) That part of the internal combustion engine in which vaporisation of the fuel occurs

carburite A mixture of equal parts carbon and iron, used for recarburizing steel in the electric furnace

carburization The dissolution of carbon in molten metals, as iron, steel, etc , produced by heating the metal in a stream of carbon monoxide or of a hydrocarbon **case-** Carburization on the surface

carbylamine* (1) Isocyanide (2) Ethylisocyanide

carbylic acid A group-name for organic acids which have carbon in their acid radical, as,



aquo- (carboxylic acids) **thio-** (dithionic acids) **ammono-** (carbazylic acids)

Cf *siliconic acid, stannonic acid*

carcel unit The brightness of the carcel lamp burning 42 grams of colza oil per hour 1 carcel unit = 9 6 candles = 7 5 German standard candles (q v)

carcinogen A substance which produces cancer in living tissues as, benzopyrene

carcinomic acid An unsaturated fatty acid isolated from cancerous serum and tissue

cardaissin A substance extracted from suprarenal glands of cows, used as a heart stimulant during operations

cardamom The seeds of *Elettaria cardamomum*, a Zingiberaceae of tropical Asia Used as an aromatic or carminative in the form of an infusion, tincture or fluid extract, and as a spice **c oil** The essential oil of c , d 0 895–0 905, it contains terpinene, dipentene and limonene **Malabar-** d 0 933–0 943, contains cineol **Siam-** d 0 905, contains borneol

cardiac Pertaining to the heart (*καρδία* = heart) **c sedative** A drug which lessens the frequency of heart action, as aconite, nitrites, veratrum **c stimulant** A drug which increases the force and frequency of the heart-beat, as, digitalis, strophanthine, caffeine, or camphor

cardiogram The tracing produced by the cardiograph either on smoked paper, or with ink on white paper **electro-** A photographic rec of the electric heart-currents, which deflect galvanometer mirror that reflects light from small bulb on to photographic paper

cardiograph A device to record the movement the heart, especially its force and character consists of a small diaphragm placed over t heart or artery which transmits the heart-b by airpressure to a recording diaphrag **electro-** A sensitive galvanometer with which t electric pulsations of the heart are measured

cardioid Heart-shaped **c condenser** A vice for concentrating light used in the ult microscope

cardol $C_{21}H_{30}O_2$ = 314 3 An irritant and o liquid from the seeds of *Anacardium occident* (cashew nuts)

carene $C_{10}H_{16}$ = 136 2 4 7 7-trimethyl- norcarene, 3 7 7-trimethyl-Δ^3-bicyclo (0 1 4) he tane A hydrocarbon of the terpene grou occurring in essential oils **d-**, Colorless, swe smelling oil, d 0 8586, b 170, $[\alpha]_D$ = 7 69°, constituent of Indian turpentine

Carex Red couch grass A genus of perenn grass-like herbs of the Cyperaceae

Carey-Foster Bridge An electrical-resistar set which consists of three bridge wires, t shunts and four sets of radio coils

cargentos Colloidal silver oxide containing small amount of casein, used as a germicide

Carica The papaw or melon tree *Car papaya*, a Caricaceae of South America **papaya c xanthin** Kryptoxanthin

caricin (1) A glucoside from the seeds of car Cf *papain* (2) A protease, papain

Carissa A genus of spiny shrubs of Apocynace from Asia and Australia

carissin A glucoside from the bark of *Car ovata*, used as a cardiac stimulant

carotinoid Carotenoid

Carius, Georg Ludwig 1829–1875 A Germ chemist, noted for research in many branches chemistry **C furnace** A combustion furna with five iron tubes

carlic acid $C_{10}H_{10}O_6$ = 226 1 An acid from t mold fungus, *Penicillium Charlesii* Cf *caro acid*

Carliczek gauze A brass wire gauze the in vidual wires are covered with asbestos

carlosic acid $C_{10}H_{12}O_6$ = 228 1 An acid fro the mold fungus *Penicillium Charlesii* S *carolinic acid*

Carl's solution A preservative for insect spe mens consisting of 170 cc 95 % alcohol, 60 c 40 % formaldehyde, 20 cc glacial acetic acid a 280 cc water Cf *fixative*

Carlsbad salt (1) Natural Sal carolinum gen inum, sal thermarum carolinarum The sal obtained by evaporation of the water of t springs at Carlsbad (Karlovy Vary Czech slovakia) (2) Artificial Sal carolinum fac tium Sal carlsbadense A mixture of 44 Na_2SO_4, 2 % K_2SO_4, 18 % NaCl, and 36 $NaHCO_3$

carminative A drug relieving colic and promo ing the expulsion of gas from the gastro-intes nal tract

carmine Coccinellin A red coloring matt obtained by precipitating a decoction cochineal with alum It is of a mixture carminic acids, carmine red, and other su stances Bright red, friable pieces, soluble ammonia water, insoluble in water or dilu acids, is used as a microscopical stain (*E*

Beale, Grenacher, Hoyer, Mayer, Nikiroff stains) **ammonia-** A solution of carmine in ammonia water **blue-** See *indigo c* **borax-** An alkaline c stain containing borax, and used to stain the nuclei of cells **indigo-** See *indigo c* **lithium-** See *Orth's stain* **c lake** A compound of carmine and alumina **c red** $C_{11}H_{12}O_7$ = 256 1 Purple lustrous crystals, obtained as a split-product of carminic acid, used as microscope stain

carminic acid $C_{22}H_{20}O_{13}$ = 492 15 Cochinilin A glucosidae hydroxyanthrapurpurin derivative from cochineal Purple-brown crystals, m 136 soluble in water or alcohol used as reagent for albumin and aluminum, as a microscope stain, and pH indicator changing at pH 5 5 red (acid) to magenta (alkaline)

carminite A lead ore containing phosphates, arsenates, and vanadates

carmoisine A carmine-red dye used in foodstuffs

carnallite $KCl,MgCl_2\,6H_2O$ = 277 85 A native, potassium, magnesium chloride found in the Stassfurt mines of Germany Cf *sylvine*

carnauba (1) The Brazilian wax palm, *Copernicia cerifera*, or (2) its root, used as an alterative **c wax** Brazil wax A wax obtained from the fresh young leaves of carnauba Yellowish or greenish masses, m 83–88, acid no 4–8, sap val 80–95, iod no 1–13 It consists mainly of myricyl cerotate, used as a polish and for phonograph records

carnaubic acid $C_{24}H_{48}O_2$ = 368 37 The monobasic acid $C_{23}H_{47}COOH$ m 72, in carnauba wax and beef kidney

carnaubyl alcohol $C_{24}H_{49}OH$ = 354 39 A constituent of carnauba wax and wool fat m 69, insoluble in water

carnegieite $Na_2Al_2Si_2O_8$ A sodium feldspar

carnegine $C_{13}H_{19}O$ = 221 15 An alkaloid from Cactaceae It is a dimethyl derivative of salsoline, q v Cf *dioscorine*

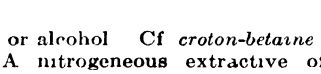
carnelian Cornelian

Carnelley, Thomas 1852–1890 An English chemist noted for his *Physico-Chemical Constants* (1885–87)

carneol Obsolete for cornelian

carnine $C_7H_8O_3N_4\,H_2O$ = 214 2 A colorless crystalline alkaloid obtained from muscles, meat extract, yeast, and certain fishes, slightly soluble in water Cf *xanthine*

carnitine $C_7H_{15}O_3N$ = 161 2 Novain γ-trimethyl-β-oxybutyro-betaine A base found in the muscle tissue of animals, chiefly cephalopods



Soluble in water or alcohol Cf *croton-betaine*

carnomuscarine A nitrogeneous extractive of muscles

carnosine $C_9H_{14}O_3N_4$ = 226 3 Ignotine, β-alanyl histidine Colorless crystals, from meat extracts, m 219 (decomp) Cf *anserine*

Carnot, Sadi 1796–1832 A French engineer **C function** The ratio between the lost and utilized heat of a living body **C theorem** The work obtainable from a given quantity of heat absorbed in a machine that is working in a reversible cycle, depends only on the temperatures of the source of heat and refrigerator

carnotite A radioactive mineral consisting of the vanadate of uranium and potassium, (23 per cent V)

Carnoy's fluid A mixture of absolute alcohol and glacial acetic acid used to fix animal tissues before staining

Caro, Heinrich 1834–1910 A German industrial chemist **C's acid** Persulfuric acid, H_2SO_5 or $HO\,SO_2\,O\,OH$

carob beans St John's bread The pods of *Ceratonia siliqua*, a Leguminosae, rich in sugar and gum used as fodder Its seeds were the carats" (q v) of jewellers Cf *tragon* **c gum** The gum of c beans, used as an emulsifier in ice-cream, lozenge and toilet cream manufacture, and as substitute for tragacanth

caroba The Brazilian caraiba tree *Jacaranda procera*, a Bignoniaceae

carobic acid A colorless crystalline acid from the leaves of caroba

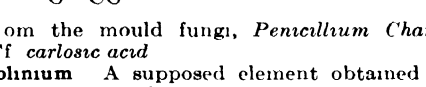
carobine An alkaloid of caroba

carobone A balsamic resin from the leaves of caroba

carol $C_{10}H_{18}O$ = 154 2 Carane-ol 5-hydroxy-carane A monobasic alcohol derived from carane and a constituent of many essential oils

carolic acid $C_9H_{10}O_4$ = 182 1 An acid from the mould fungi *Penicillium Charlesii* Cf *carlic acid*

carolinic acid $C_9H_{10}O_6$ = 214 1



from the mould fungi, *Penicillium Charlesii* Cf *carlosic acid*

carolinium A supposed element obtained from thorium minerals

carolite Carrollite

carone $C_{10}H_{16}O$ = 152 2 5-Ketocarane A ketone of essential oils, derived from carane A colorless, oily, odorous liquid, b 210

carony bark Angostura bark

carotenase An enzyme of the liver which splits carotene in half, thus producing vitamin A

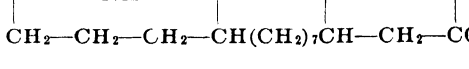
carotene $C_{40}H_{56}$ = 536 6 Carotin carotol, primary vitamin A A lipochrome m 174 b 287, occurring in leaves carrots and other foodstuffs, where it is associated with chlorophyll, also in animal tissues, blood serum, milk fat, etc It is the precursor of vitamin A and exists in several isomeric forms α- (the smaller portion) is optically active, m 172 max absorption bands at 521 and 485 mμ β- (the larger portion) is optically inactive m 182, max absorption bands at 511 and 478 mμ Cf *xanthophyll, carotenoids* **red-** Lycopin

carotenoids Carotinoids, polyenes A group name for lipochromes or carotene-like plant pigments which are deposited in animal tissues They may be hydrocarbons alcohols ketones or acids, characterized by a series of alternate double bonds Cf *cholane ring, cerebrosides* See Table

carotin Carotene

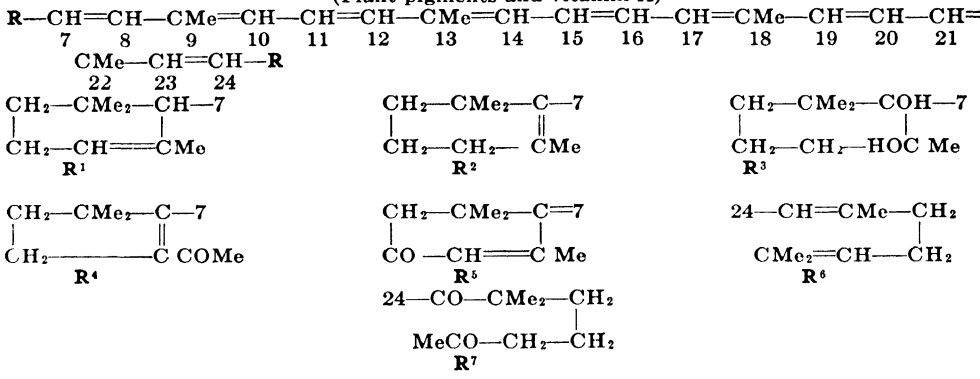
carotinoids Carotenoids

carpaine $C_{14}H_{25}O_2N$ = 239 3 An alkaloid from the leaves of *Carica papaya* a Caricaceae Colorless crystals soluble in alcohol ether or chloroform, m 119, used as a diuretic and heart



stimulant, and resembles digitalis in action **c hydrochloride** $C_{14}H_{25}O_2N\,HCl$ = 275 67

CAROTENOIDS
(Plant pigments and vitamin A)



Polyene Hydrocarbons

$C_{40}H_{56}$	alpha-carotene	R^{1}-7	24-R^{2}
	beta-carotene	R^{2}-7	24-R^{2}
	gamma-carotene	R^{2}-7	24-R^{6}
	delta-carotene	R^{1}-7	24-R^{6}

Polyene Alcohols

$C_{20}H_{29}OH$	vitamin A	R^{2}-7	15-OH	
$C_{40}H_{55}OH$	kryptoxanthin	R^{2}-7	24-R^{2}	-OH at 3
	rubixanthin	R^{2}-7	24-R^{6}	-OH at 3
$C_{40}H_{58}O_2$	β-oxycarotene	R^{3}-7	24-R^{2}	
$C_{40}H_{53}O_2$	xanthophyll	*from green plants*		
$C_{40}H_{56}O_2$	zeaxanthin	*from seeds, seed pods*		
$C_{40}H_{56}O_4$	violaxanthin	*from pansies, orange rinds*		
$C_{40}H_{56}O_4$	taraxanthin	*from dandelion*		
$C_{40}H_{56}O_6$	fucoxanthin	*from brown algae*		
$C_{35}H_{50}O_3$	capsanthin	*from paprika*		

Polyene Ketones

$C_{40}H_{50}O_n$	rhodoxanthin	R^{5}-7	24-R^{5}
$C_{40}H_{56}O_n$	semicarotenone	R^{2}-7	24-R^{7}
$C_{40}H_{54}O$	dehydrosemicarotenone	R^{4}-7	24-R^{2}

Polyene Acids

$C_{20}H_{24}O_4$	crocetin	HOOC-9	22-COOH
$C_{27}H_{38}O_4$	azafrin	R^{3}-7	20-COOH
$C_{25}H_{30}O_4$	bixin	MeOOC-8	23-COOH

The structures of these compounds are shown by connecting the indicated radicals at the carbon atoms of the chain

White crystals m 225 soluble in water and used in hypodermic medication

carpamic acid $C_{14}H_{27}O_3N$ = 257 2 An acid formed on hydrating carpaine

Carpenter, Sir Harold 1875-1940 A British metallurgical chemist

carposide A glucoside obtained from carica, and identical with *caricin*

Carr oven A single-walled vacuum oven

carragheen Irish moss

Carrel-Dakin solution An isotonic NaOCl solution used for bathing and irrigating wounds Cf *Dakin solution*

carrene Methylene chloride

carrollite Co_2CuS_4 A rare, native, cobalt-copper sulfide

carron oil An emulsion of linseed oil in lime-water, used for burns First used at the Carron iron works, Scotland

carrotin Carotene

carroting The preparation of hair for felting

carstone A ferruginous sandstone of Norfolk (England)

carthamein An oxidation product of carthamin

carthamic acid Carthamin

carthamin $C_{14}H_{16}O_7$ = 296 2 The red coloring matter of the safflower, *Carthamus tinctorius* Dark red scales, insoluble in water, soluble in alkali carbonate solutions, used as a dye and coloring matter

carthamus African saffron A genus of composite plants, as *C tinctorius*, false or American saffron or safflower, cultivated in Asia, used as a dye, condiment and for making rouge

cartilagin Chondrigen The protein of cartilage, or the white, elastic substance of the bone surface, changed, by boiling, to chondrin

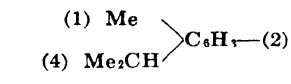
carubinose *d*-Mannose

carum Caraway Cf *ajava*

carvacrol $C_{10}H_{14}O$ = 150 16 2-hydroxy-p-cymene, isopropyl-o-cresol, isopropylhydroxy-toluene, 2-cymophenol, 2-methyl-5-isopropyl-phenol, oxycymol, 1-methyl-2-hydroxy-3-iso-propylbenzene, Me $C_6H_3(OH)C_3H_7$ An aromatic constituent of essential oils, camphor, origanum, caraway, savory and other Labiatae A thick, colorless, oily liquid, d 0978, m 0, b 236, insoluble in water, soluble in alcohol, ether or alkalis Used in perfumery, and as a vermifuge and fungicide **c iodide** $C_{10}H_{13}OI$ = 276 06 Iodocrol An almost odorless compound, used as an iodoform substitute

carvacrotic acid A colorless crystalline acid derived from carvacrol

carvacryl The monovalent radical, derived from

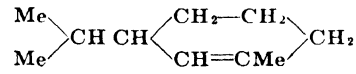


carvacrol **c amine** Cymidine

carvene d-Limonene

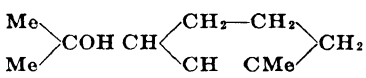
carveol $C_{10}H_{16}O$ = 152 16 2-hydro-xylimonene, $\Delta^{1\ 8}$(9)-terpadiene-ol-2, 1-methyl-2-hydroxy-4-isopropylene-tetrahydro-benzene, $MeC_6H_7(OH)C_3H_5$ A constituent of several essential oils of the Labiatae family, b 232

carvestrene $C_{10}H_{18}$ = 138 11 1-m-terpene, 1-methyl-3-isopropyl-tetrahydro-benzene,



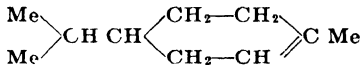
A hydrocarbon in essential oils

carvestrol $C_{10}H_{18}O$ = 154 2 1-m-menthenol, 1-meta-terpenol-8 The alcohol derivative of carvestrene



carvol Carvone

carvomenthane $C_{10}H_{18}$ = 138 14 Δ^1-terpene, 1-methyl-4-isopropyl-tetrahydro-benzene

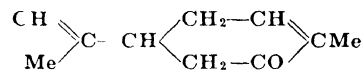


A hydrocarbon from carvone A colorless liquid, d 0 806 b 175

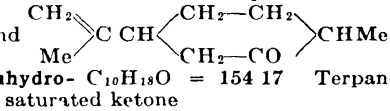
carvomenthol $C_{10}H_{20}O$ = 156 2 2-*p*-menthanol An isomer of menthol in essential oils, d 0 904, b 222, soluble in alcohol

carvomenthyl The monovalent radical, $-C_{10}H_{17}$, derived from carvomenthane **c amine** $C_{10}H_{17}NH_2$ = 153 2 Tetrahydro-carvyl-amine A colorless liquid, b 212

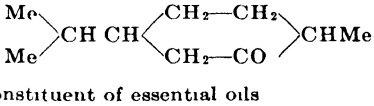
carvone $C_{10}H_{14}O$ = 150 16 $\Delta^{6\ 8(9)}$-terpadienone-2, $\Delta^{6\ 8(9)}$-2-p-menthadienone, 1-methyl-2-oxy-4-isopropylene-Δ^6-tetrahydro-benzene



A constituent of the oils of caraway, cumin and dill A colorless liquid, b 225 **dihydro-** $C_{10}H_{16}O$ = 152 16 $\Delta^{8\ 9}$-terpenone The compound



tetrahydro- $C_{10}H_{18}O$ = 154 17 Terpanone-2 The saturated ketone



A constituent of essential oils

c anil $C_{10}H_{13}O\ NHPh$ = 241 2 A light-yellowish oil, b 180, which darkens with age

carvylamine tetrahydro- Carvomenthylamine

Carya The hickory tree, *Carya tomentosa* (Juglandaceae) of North America, cultivated for its wood and fruits (pecans)

caryin A crystalline compound from the bark of carya

caryinite A native phosphate and arsenate of lead

caryl- The monovalent radical, $C_{10}H_{17}$— derived from carane **c amine** 5-carylamine $C_{10}H_{17}NH_2$

caryocinesis Karyokinesis

caryophyllin $C_{30}H_{48}O_3$ = 456 4 Oleanolic acid A ketone from oil of cloves, soluble in alcohol or ether

caryophyllinic acid $C_{20}H_{32}O_8$ = 400 3 An acid derived from caryophyllin

caryophyllum Cloves The flower-heads of *Eugenia caryophyllata*, a Myrtaceae They are brown in color, have a strong fragrant and spicy odor, and contain an oil used as a flavoring and aromatic stimulant

casca The Spanish and Portuguese word for "bark" **c bark** Erythrophloeum

cascara amarga Honduras bark The bark of *Picramnia antidesma* a Simarubaceae of tropical America, used as a tonic and alterative **c sagrada** Sacred bark Chittem bark, bearwood The bark of *Rhamnus purshiana*, a shrub of the Western United States It is a cathartic, stimulant and laxative, and is used as a fluid extract, or tincture See *peristaltin, cascarin, anthraglucosagradin*

cascarilla The bark of various *Croton* and *Cinchona* species, especially *Croton eluteria* The fluid extract or tincture is used as a stomachic tonic

cascarillic acid $C_{11}H_{20}O_2$ = 184 14 An acid from the oil of cascarilla Colorless liquid, d 9324, m −15 b 270

cascarilline $C_{11}H_{18}O_4$ = 226 2 Colorless bitter crystals from the bark of *Croton eluteria*

cascarin A colorless crystalline glucoside from Cascara sagrada, used as a hypodermic purgative

case harden To harden wrought iron by heating it in contact with carbon or potassium ferrocyanide A surface layer of steel is produced See *carburization, cementation*

caseanic acid $C_9H_{16}O_7N_2$ = 264 15 An acid from casein

casease A bacterial ferment that dissolves casein Cf *caseinase*

caseate Caseinate

caseation The curdling of milk and the transformation of it into a cheesy mass

casein The protein of milk, and principal constituent of cheese A white substance, soluble in acids and alkalis Used as food, technically, in combination with formaldehyde, as a plastic and for synthetic resins, in the leather industry, as a substitute for linseed oil in making pigments, for making albumin, rubber, and gelatin for films, and as a glue when mixed with lime The composition of a typical casein is

carbon	53 %
hydrogen	7 %
oxygen	22 65 %
nitrogen	15 7 %
sulfur	0 8 %
phosphorus	0 85 %

Its isoelectric point is pH 4 7, hence it occurs as

neutral casein at	pH 4 7
metal caseinate	above pH 4 7
casein salt	below pH 4 7

animal- Casein **blood-** Obsolete name for albuminose **fibrous-** See *aralac, lanital* **gluten-** Vegetable casein **milk-** Casein **saliva-** Ptyalin **vegetable-** A protein from

the seeds of various cereal plants, forming 10–20 % of the gluten of flour

caseinase Rennase

caseinate Caseate A compound of casein with a metal, as, sodium c

caseinic acid $C_{12}H_{24}O_5N_2$ = 276 21 An acid from casein

caseinogen A compound protein of milk which yields casein by the action of digestive ferments

Casella acid *2 7*-Naphthol sulfonic acid

cashew The nut of *Anacardium occidentale*, a tree of tropical America Cf *anacardium* **c oil** A yellow oil, used in lacquers and paints cf *harvel coating*

casimirin A glucoside from the seeds of white sapota or *Casimiroa edulis*, a Rutaceae of Mexico, used as a hypnotic and analgesic

casoid A synthetic plastic made from a casein basis

cassareep The evaporated juice of the bitter cassava, used in the West Indies as a preservative for meat

cassava Manioc, mandioc, manihot, etc A group of Euphorbiaceae cultivated in South and Central America as **bitter-** *Manihot utilissima* and **sweet-** *Manihot aipi* Their large tuberous roots contain starch, and are used in preparing tapioca and Brazilian arrowroot

cassel brown A brown pigment found near Cassel (Germany) It is a fossilized humus of the tertiary period **c yellow** A form of lead oxychloride

Casseler green Barium manganate

casseliase A mica peridotite from Kentucky

casselose A nephelite-melilite basalt from Texas

casserole A laboratory porcelain dish with a handle

Cassia (1) An obsolete term for sweet smelling trees (2) A genus of leguminous herbs and trees (3) An inferior cinnamon from *Cinnamomum cassia*, used as spice and as a source of oil **purging-** The pulp of the pods of *Cassia fistula* **c bark** Chinese cinnamon **c buds** The unripe fruit of various cinnamon species **c leaves** Senna **c oil** Chinese oil of cinnamon An essential oil from the bark of *Cassia chinensis* It is darker and heavier than cinnamon oil, and less agreeable to the taste **c seeds** The fruits of *Cassia fistula*, a tree of East India, used as a laxative and for poultices

cassina Holly from the sea coast of Southern U S , its leaves are used in a beverage

cassiopeium Cp = 175 0 The name given to lutecium, *q v* by Auer von Welsbach, who separated it from ytterbium in 1905

cassiterite SnO_2 Tinstone, block tin, tin spar, stream tin Native stannic oxide, a tetragonal brown, black, red or yellow mineral, d 6 9, hardness 6–7, generally found as rounded pebbles in the streams of Malaya

cast (1) To form a molten substance into a definite shape or state by allowing it to cool in a mold (2) Cf *casts*

castanea The leaves of *Castanea vulgaris*, the chestnut tree of the United States, used as fluid extract for whooping cough

castanhao oil Brazil nut oil A liquid fat expressed from the seeds of *Bertholletia* species

castelamarin $C_9H_{14}O_8$ = 170 11 A bitter principle, m 269, from *Castela nicholsoni*, a Simarubaceae Cf *amargosa bark*

castine An alkaloid from *Vitex Agnus castus*, a Verbenaceae

castonin A globulin from European chestnut

castor (1) The beaver, *Castor fiber*, an amphibious rodent (2) Castoreum A brown, strong-smelling, solid substance from the preputial follicles of the beaver, used as an antispasmodic and stimulant **c beans** The seeds of *Ricinus communis* **c oil** Ricinus oil The fixed oil expressed from the castor bean A transparent, pale-yellow liquid, $d_{25°}$ 0 945–0 965, used as a mild purgative Cf *dericin, ricinolein* **c pomace** The solid residue from the extraction of c oil from the c bean Used as fertilizer and contains 4 1–6 6 % N, 1–1 5 % P_2O_5 and 1–1 5 % K_2O **c seeds** C beans

castoreum Castor **c oil** Essential castor oil A pale-yellow liquid obtained by distillation of castoreum

castoric acid An acid in castoreum

castorin A white fatty substance in castoreum

casts Cylindrical structures formed in uriniferous tubules, and found in urine sediment **blood-** C consisting of erythrocytes, and indicating a renal hemorrhage **epithelial-** C consisting of epithelial cells and indicating acute nephritis **fatty-** C consisting of fat globules or fatty acids, and indicating a degeneration of the kidney **granular-** C consisting of granular material and indicating an inflammatory kidney **hyaline-** C consisting of the basic material of casts, commonly found in all kidney disorders **pus-** C consisting of pus cells or leucocytes, indicating renal suppuration **waxy-** C consisting of the light-yellow basic material commonly found in amyloid disease

cata- A prefix derived from the Greek κατα, meaning down, against back or of a lower order Cf *ana-*

catabiotic Capable of using up or dissipating **c force** The energy derived by an organism from the metabolism of its food

catabolism Disintegration or the breaking down of tissues, the destructive metabolism by which living matter is transformed into waste materials and eliminated from the body Cf *anabolism*

catadyn An oligodynamic catalyst (q v) used for sterilization, as, silver

catalase (1) An oxidizing enzyme of blood and the tissues which splits peroxides to oxygen and water (2) The oxidizing enzyme of fresh tobacco leaves Cf *peroxidase*

catalasometer An instrument which measures the activity of the catalase in a liquid (*e g* , milk) from the change in the level of a liquid in the graduated tube passing through the stopper of the closed vertical cylinder in which the reaction occurs

catalinite Beach pebbles of Santa Catalina Island, a green, red or brown variety of quartz

catalysant The substance on which a catalyst acts Cf *substrate*

catalysate The product of catalysis

catalysis Contact action or cyclic action The effect produced by a small quantity of a substance on a chemical reaction, after which the substance (catalyst) appears to remain unchanged Theories

(1) Chemical Formation of an intermediate compound, *chemical* catalyst, q v

(2) Adsorption Contact action, *mechanical* catalyst, q v

(3) Radiation Excitation by light, *photochemical* catalyst, q v

heterogenous- The acceleration of a chemical reaction in a heterogeneous system, *e g* , a

solid catalyst in a gas mixture **homogenous-** The acceleration of a chemical reaction in a homogeneous mixture, *e g*, catalyst and reacting substances are either gases, or liquids **iso-** The phenomenon of two catalytic influences in the same system and at the same time **isomeric-** The transformation of a substance to an isomeric form by a catalyst **negative-** (1) The retardation of a reaction by a catalyst, *e g*, mannitol reduces the oxidation of P (2) The stopping of a reaction by a substance added to the system, *e g* O_2 stops the reaction of H_2 and Cl_2 **photo-** The acceleration of a reaction by light **photochemical-** The action of light as a catalyst **pseudo-** Acceleration of a chemical reaction by a chemical catalyst

catalyst Catalyzator, catalyzer, catalytic agent A substance which effects catalysis **chemical-** A substance which changes the speed of a chemical reaction, probably by taking part in its chemical reaction, but which is formed again as a reaction product, hence is again present in its original concentration at the end of the reaction An example is the rôle of nitric acid in the lead chamber process of making sulfuric acid **inducing-** Promoter A substance which stimulates or aids in catalysis **mechanical-** A substance which influences the speed of a chemical reaction without itself undergoing a change, *e g*, the reaction of $2H_2O_2 = 2H_2O + O_2$ is accelerated by colloidal Pt, or Au **negative-** Retarder A substance which retards a chemical reaction **positive-** Accelerator A substance which accelerates a chemical reaction Cf *enzyme, ferment, vitamin, sensitizer*

catalytic Pertaining to catalysis **c action** Catalysis **c agent** Catalyst **c force** The mechanical expression of the change in the speed of a chemical reaction produced by a catalyst **c poison** Anticatalyzers, paralyzers A substance which counteracts the effect of a catalyst *e g* HCN will prevent the catalysis of H_2O by colloidal Pt **c process** Contact process The manufacture of industrially important substances by catalysis, *e g*, fixation of atmospheric nitrogen, manufacture of sulfuric acid (*contact process*)

catalyzer Catalyst

catamorphism The chemical and physical changes produced on rock by the action of wind and water Cf *anamorphism*

cataphoresis Kataphoresis The downward motion of electrically charged particles suspended in a medium under the influence of an electric field Cf *endosmosis* Its antonym *anaphoresis* implies upward motion

catapleite A complex zirconium silicate

catechin $C_{15}H_{14}O_6$ = 290 01 An acid substance from catechu, mahogany wood, and kino An amorphous yellow powder, soluble in water, alcohol or alkalis, used for tanning and in calico printing **c a** $+3H_2O$ *dl*-catechol, acacatechin The principal constituent of acacia catechu Thin needles, sintering at 100, and m 214 **c b** $+4H_2O$ *d*-catechol, gambir catechin Thin needles, m 93–95, soluble in alcohol or ether **c c** $+4H_2O$ *d*-epicatechol Thin needles, anhydrous at 274

catechol (1) Pyrocatechol (2) Catechin **benzoylpyro-** Dihydroxybenzophenone **dimethoxy-** Veratrol **methyl-** Guaiacol

catechu Cutch, cashoo, black catechu An extract of the dark heart-wood of *Acacia catechu*, used as tincture, fluid extract, or powder, as an astringent in diarrhea, leucorrhea, and hemorrhages Cf *japonic acid* **pale-** Gambir **c palm** Areca

catechuic acid Catechin

catechuretin $C_{34}H_{28}O_{12}$ = 676 22 A substance produced from catechu by the action of sulfuric acid

catechutannic acid A reddish, amorphous substance obtained from catechu, believed to be the anhydride of catechuic acid

catelectrode Cathode

catenary The curve assumed by a chain suspended at each end

catgut An aseptic cord prepared from animal intestines (*e g* sheep) and used for ligatures

cathartic A drug which causes the evacuation of the bowels, *e g* castor oil, croton oil, magnesium sulfate Cf *purgative, laxative, aperient, hydragogue*

cathartic acid $C_{180}H_{96}O_{82}N_2S$ A glucoside and active principle of senna

cathartin (1) A bitter principle of senna (Lassaigne and Feneulle) (2) A compound from the ripe fruits of *Rhamnus cathartica* (Winkler) (3) A compound from jalap

cathartogenin A split product of cathartic acid

cathartomannite $C_{21}H_{44}O_{19}$ A non-fermentable carbohydrate-like substance from senna

cathetometer A precision instrument for the measurement of small vertical displacements It consists usually of a microscope mounted on a rigid vertical rod, with cross wires and a scale

cathidine, cathine, cathinine Three alkaloids from African tea, the leaves of *Catha edulis*, a Celastraceae of Northern Africa Cf *katine*

cathine $C_9H_{13}ON$ = 151 11 *d*-nor-*l*-ephedrine A crystalline alkaloid, m 77, soluble in water, from bushman's tee (boesmanstee), the leaves of *Catha edulis*, a Celastraceae, from N and S Africa Cf *celastrine, katine*

cathode Kathode, negode, katode The negative pole or electrode of a galvanic battery, cell, electric current or electric device **c deposit** (1) A precipitate of a metal produced by electrolysis (2) A metallic mirror formed on the glass near the cathode of vacuum tubes See *cathodic sputtering*

cathode rays Negative rays A stream of negatively charged electrons issuing from the cathode of a vacuum tube perpendicular to the surface, with velocities (10^9 to 10^{10} cm /sec) depending upon the existing potential difference When they are stopped by a solid substance they produce heat, phosphorescence, x-rays pressure, or photographic action The charge on a single electron is $4\ 77 \times 10^{-10}$ e s u, its mass 9×10^{-28} grams, or $\frac{1}{1800}$ of an H atom, its diameter 4×10^{-13} cm They are analogous to the β-rays of radioactive matter

cathodic sputtering The disintegration of the cathode metal in an electric discharge tube, as a result of which the surrounding glass is covered with a mirror of finely-divided cathode metal

catholyte The liquid in the immediate neighborhood of the cathode during electrolysis Cf *anolyte*

cation Kathion, cathion, negion (1) A positively charged atom, radical or group of atoms, which passes to the cathode or negative pole during electrolysis (2) A positively charged gas molecule

cationotropy A case of ionotropy (q v) in which a H^+ or M^+ breaks off a molecule and leaves a

negative ion in dynamic equilibrium Cf *prototropy*

catlinite Pipestone A red clay from the Upper Missouri Region, used by the Indians for pipes

catoptric An optical system with metallic reflectors instead of glass mirrors

catoptrics A branch of physics that deals with mirrors and reflected light

catoptron A mirror

catoptroscope A device for examining objects by reflected light

Cauchy's formula An equation by which the wavelength, λ, and frequency, n, measured in air are converted to vacuum conditions $(n - 1)10^7 = a + b/\lambda^2 \times 10^{-8} + c/\lambda^4 \times 10^{-16}$ At 15°C and 760 mm the values are for a = 2726 43, b = 12 288, c = 0 3555 At 0°C and 760 mm, a = 2875 66, b = 13 412, and c = 0 3777

caulophyllin A resinous precipitate obtained by pouring concentrated tincture of caulophyllum into water

caulophylline An alkaloid from blue cohosh, the root of *Caulophyllum thalictroides* Colorless, odorless crystals

caulophylloid The combined principles from caulophyllum, used for the relief of congestive and spasmodic conditions of generative organs

caulophyllosapogenin $C_{56}H_{88}O_9$ = 904 68 A glucoside, m 315 from caulophyllum

caulophyllum Squaw root, blue cohosh The rhizome and roots of *C thalictroides*, a Berberidaceae of North America It is a sedative, diuretic, and antispasmodic, used as fluid extract and tincture

caulosaponin $C_{54}H_{88}O_{17}$ = 1008 7 Leontin A glucoside, m 255 from caulophyllum

caustic (1) Corrosive or burning (2) The hydroxide of a light metal, *e g*, caustic soda (3) A curve or surface of maximum brightness produced by the concentration of rays of light after reflection or refraction (4) A drug which destroys the soft tissues of the body, used to destroy pathological tissues, an escharotic **lunar-** Silver nitrate **Vienna-** KOH fused with lime Cf *soda-lime* **volatile-** Ammonium hydroxide

c curve The line produced by the intersection of a number of reflected or refracted rays of light **c lime** Calcium oxide **c potash** Potassium hydroxide **c soda** (1) Sodium hydroxide (2) An impure, solid, or ground sodium hydroxide containing 76–78 % of sodium oxide used in the manufacture of soap, paper, paints, leather, chemicals, and drugs, also for softening water, mercerizing cotton, refining oils, and in the preparation of cleansers

causticity The extent to which a substance is caustic It is given (as a percentage) by the expression 100(2x − y)/y, where x and y are the cc of hydrochloric acid necessary to make the solution neutral to phenolphthalein and methyl orange, respectively Hence it expresses the relative proportions of carbonate and hydroxide

causticized ash A mixture of soda-ash (Na_2CO_3) and caustic soda (NaOH), containing from 15–45 % NaOH Used as water softener, for cleansers, and in the manufacture of leather

Cavendish, Henry 1731–1810 An English philosopher and chemist noted as a pioneer in specific heat and eudiometry and as the discoverer of hydrogen He determined the compositions of water, air and nitric acid

Caventou, Joseph Bienaimé 1795–1877 A French pharmacist and discoverer of brucine, strychnine and quinine (with Pelletier)

cavitation The production of emulsions by disruption of a liquid into a two-phase system of liquid and gas, when the hydrodynamic pressure in the liquid is reduced to the vapor pressure

cawk Barytes

cayaponine A purgative alkaloid from *Cayaponia globosa* a Cucurbitaceae of Brazil

cayenne pepper Capsicum

Cb The symbol for *columbium*

cc Abbreviation for cubic centimeter

Cd The symbol for cadmium

Ce The symbol for cerium

ceanothine An alkaloid from New Jersey tea, the root of *Ceanothus americanus* a Rhamnacea of the Eastern United States Used as a purgative in dysentery, syphilis, etc

ceara rubber The coagulated latex of *Manihot glaziovii*, an Euphorbiaceae of Brazil and Argentine

cebil gum The reddish-yellow tears from *Piptadenia cebil*, a Leguminosae of Brazil Cf *angico*

cebur balsam Tagulaway

cecilose A pyroxenite or websterite from Maryland

cedar A group of trees of the pine family **red-** Juniperus **white-** Thuja

c gum Pale-yellow tears from *Cedrela toona* (Indian mahogany) a Meliaceae of Queensland **c leaves oil** C oil **c oil** The essential oil, d 0 870–0 890 from *Juniperus virginiana*, used in microscopy as clarifying agent and for oil-immersion lenses It contains limonene, cadinene borneol and esters **c wood oil** Essential oil from the wood of *Cedrela odorata*, a large tree of the West Indies and South America An odorous liquid, d 0 945–0 960, soluble in alcohol, containing cedrene and cedrol

cedarite Chemavinite

cedrarine Orexin

cedrene $C_{15}H_{24}$ = 204 2 A hydrocarbon, the liquid part of oil of red cedar, d_{15}° 0 984, b 237 **c camphor** Cedrol

cedrin An active principle of cedron Colorless bitter crystals, soluble in water used as an antiperiodic

cedrol $C_{15}H_{26}O$ = 222 2 Cedrene camphor The crystalline portion m 87, b 294 of oil of red cedar

cedron The seeds of *Simaba cedron*, a Simarubaceae of Central America, used as a febrifuge

cedronella Lemongrass

cedronine An alkaloid from cedron

cel A unit of velocity, the velocity imparted by 1 dyne in 1 second to 1 gram

celadonite A species of glauconite

celandin Chelidonium

celandine Pilewort **greater-** Chelidonium **lesser-** Pilewort

celastin Menyanthin

celastrine An alkaloid from the seeds of *Celastrus scandens* and other Celastraceae A white crystalline powder, a stimulant causing an increase in body temperature Cf *cathine*

celery The vegetable *Apium graveolens*, an Umbelliferae Cf *apiol*, *apigenin* **c seeds** Used as a spice and for making **c seed oil**, which contains selinene and apiol A colorless liquid, d 0 870–0 895

celestine $SrSO_4$ A native strontium sulfate deposited in sedimentary rocks

celite A diatomaceous earth (*e g*, kieselguhr) used to aid filtration

cell **(1) Biological** The anatomical unit of life of which all living matter is constituted, and from which it develops It consists essentially of a small protoplasmic mass which is an ever-changing and ever-circulating colloidal chemical system of proteins, and is differentiated into a nucleus and cell body According to its structural character this protoplasm is divided as follows

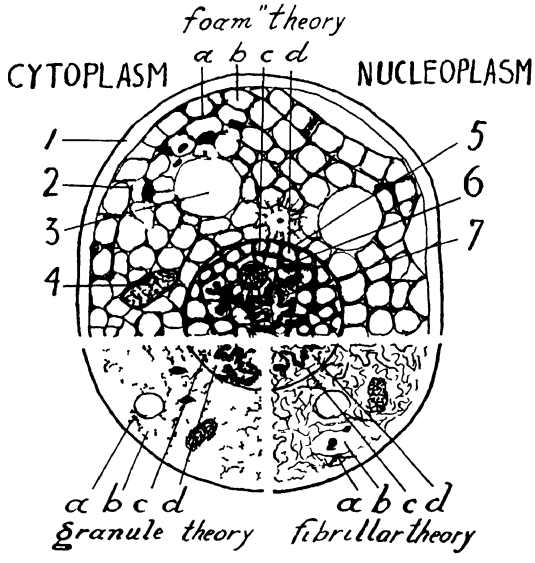
protoplasm

cytoplasm (cell body) *normally pH 6 6*		nucleoplasm (cell nucleus) *normally pH 7 5*	
a	b	c	d
spongioplasm (the solid portion or fibers)	hyaloplasm (the liquid portion or fluid)	linin (the solid portion)	nucleoplasm (the liquid portion)

Each one of these structural elements of protoplasm may form or contain further specialized units of matter, as

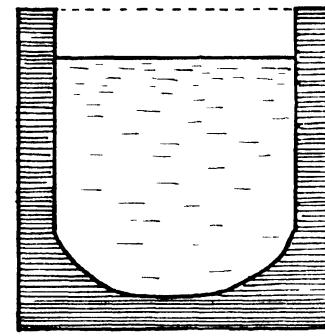
in the cell body		*in the nucleus*	
1	cellular membrane	5	nuclear membrane
2	granules	6	nucleolus
3	vacuoles	7	chromatin and chromosomes
4	plastids		

(2) Galvanic An electrical element, or device for transforming chemical into electrical energy, the action of which is due to the passage of ions through an electrolyte It usually consists of a metal or other substance immersed



Cell (schematic)

in an electrolyte containing ions of that substance, and connected by a liquid bridge (*e g*, a tube containing an electrolyte), to a second electrode which is similar in type to but not identical with the first Cf *galvanic battery*, *concentration c* A cell consists of the containing vessel, two electrodes (anode and cathode) one or more electrolytes providing anions and cations and the respective metals **(3) General** Any container *e g*, filled with an absorbing liquid, as a light filter **air-** The air-containing chambers of the lungs or of vegetable tissues **alkali-** Photoelectric c **amoeboid-** A cell resembling an amoeba, *e g*, a leucocyte **animal-** The cells of animal tissues **asexual-** A cell which reproduces itself without external



Cell (definition 3)

stimulus **bichromate-** An electric amalgamated zinc-carbon cell Voltage = 2 0 volts The electrolyte is a 12 % solution of potassium dichromate containing (approximately) 9 % of sulphuric acid **blood-** See *blood* **Bunsen-** See *Bunsen* **cadium-** See *cadmium* **carrier-** Leucocyte **chromatophore-** A biological unit containing coloring matter **Clark's-** See *Clark* **columnar-** An elongated cell, a number of which form part of the epithelial tissue **concentration-** A galvanic c produced by a combination of 2 electrodes consisting of the same substance (usually a metal), immersed in solutions containing ions of the substance which differ only in the concentrations of the ions concerned, *e g*, the system Ag/0 1N $AgNO_3$/0 01N $AgNO_3$/Ag **Daniell-** An electrical zinc-copper cell, (about 4 volts) **daughter-** A cell produced by the division of another (mother) cell **dead-** A c which has ceased to perform vital functions, it may serve for mechanical protection, *e g*, horn, hair, or cork cells **diffusion-** A percolator for the extraction of sugar from beets **dry-** See *dry* **electrical-** (1) An accumulator (2) A voltaic c (3) An electrolytic c **electrolytic-** (1) A c used for electroplating (2) Galvanic c **electroresponsive-** See *electroresponse* **embryonic-** A c from which the various tissues develop **epithelial-** A cell of the skin **galvanic-** See *cell* (2) and *galvanic* **giant-** An abnormally large cell **Leclanché-** An electrical zinc-carbon cell, (about 1 5 volts) **locomotive-** A cell capable of independent movement **optical-** See *selenium* **oxidation-reduction-** An electrolytic cell utilizing an oxidation-reduction reaction **photo-conductive-** p-electric, p-emissive, p-voltaic See *photo* **reversible-** An electrolytic cell in which the energy spent in reversing the chemical changes in the cell is approximately equal to that given out by the direct operation of the cell **secondary-** (*biol*) A cell formed by the coalescence of other cells (*electr*) An accumulator **sele-**

nium- See *selenium* **standard-** A device for obtaining a definite voltage, *e g* , cadmium cell **transition-** (*biol*) A cell whose characteristics, are between two well defined types of cells, and which is supposed to change from one type to the other (*electr*) A voltaic cell which contains an electrolyte undergoing a definite change at some temperature, *e g* , $ZnSO_4 7H_2O$ changes at 39°C to $ZNSO_4 6H_2O$, with corresponding change in the e m f , hence a Clark cell (q v) must be kept below 39°C **voltaic-** See *cell* (2) **Weston-** Cadmium cell

c constant Resistance capacity **c division** See *karyokinesis*

cellase Cellulosase A ferment which digests cellulose

cellit Technical acetyl cellulose

cellobiose $C_{12}H_{22}O_{11}$ = 342 17 Cellose A disaccharide, glucose-β-glucoside, m 225, obtained as intermediate product in the hydrolysis of cellulose, used as bacteriological reagent

celloidin Collodion wool A concentrated solution of pyroxylin Used in microscopy for embedding specimens or section-cutting

cellon Tetrachlorethane

cellophane The registered trade name for the elastic, transparent, heat-resistant, water- and oil-insoluble, gas-tight cellulose film obtained by the precipitation of a viscose solution with ammonium salts Used as a substitute for celluloid, guttapercha and parchment paper

cellose Cellobiose

cellosolve $C_4H_{10}O_2$ = 90 08 Glycol ethyl ether hydroxyether, *2*-ethoxyethanol*, ethyleneglycol ethylether, glycolmonoethylether, $EtOCH_2CH_2OH$ A colorless liquid, d 0 935, b 135 3 soluble in water alcohol or ether, used as a solvent **butyl-** $C_6H_{14}O_2$ = 118 11 Glycol butyl ether, *2*-butoxyethanol*, ethyleneglycol monobutylether, $BuO CH_2 CH_2OH$ A colorless liquid d 0 931, b 170 6, used as a solvent, especially for brushing lacquers **ethyl-** Cellosolve **methyl-** $C_3H_8O_2$ = 76 0 Ethyleneglycol monomethylether, methoxyhydroxy ethane, methoxyethanol*, $MeO(CH_2)_2OH$ A volatile liquid, d 0 930, b 134, miscible with toluene or turpentine Used as solvent for nitrocellulose in the manufacture of lacquers

c acetate $C_4H_8O_3$ = 104 0 Hydroxyethylacetate, glycol monoacetate $MeCOO(CH_2)_2OH$ A colorless volatile liquid, d 0 976, b 153, soluble in toluene, used for lacquers **c butylate** $C_6H_{14}O_2$ = 118 1 A colorless liquid d 0 902, b 170 used as solvent for nitrocellulose

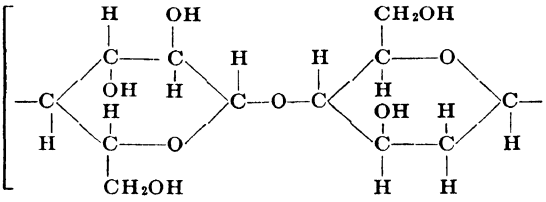
cellotropin C_6H_4O Ph COO $C_6H_{11}O_5$ = 376 16 Monobenzoyl-arbutin A white, odorless and tasteless powder, insoluble in water or ether, soluble in alcohol, used for pulmonary tuberculosis and scrofula

celluloid Zylonite xylonite A malleable substance prepared from nitrocellulose (pyroxylin or nitrated cotton) and camphor, pressed into various shapes and rendered less inflammable by the addition of ammonium phosphate and other ingredients Used in the manufacture of many articles, and sometimes in dentistry and surgery

cellulosans Pentosans associated with cellulose in wood

cellulosase Cellase

cellulose $(C_6H_{10}O_5)x$ = (162)x A carbohydrate constituent of the walls and skeletons of vegetable cells A polymer of the glucose-residue units



to O of next glucose-residue A *c micelle* is considered to contain from 1500–2000 such units arranged in 40–60 *cellobiose* chains, each containing from 15 to 20 pairs of glucose-residues It is almost pure in pith, absorbent cotton, and filterpaper, and is a colorless, transparent mass, insoluble in water, alcohol, ether, or other solvents, but soluble in copper ammonium hydroxide and also dissolved by sulfuric acid with the formation of amyloid (parchment paper) (See *collodion celluloid, pyroxylin, gun cotton, nitrocellulose, rayon, acetylcellulose viscose*) The sources of c are

1 Seed fibers (87–91 %), as, cotton kapok and other flosses
2 Woody fibers (58–62 %), as, pine
3 Bast fibers (32–37 %), as, straw, flax hemp ramie
4 Leaf fibers, as, sisal and manila hemp

C is divided into the following fractions by digestion with 17 5 % NaOH α-insoluble, β-soluble, but reprecipitated by acids, γ-soluble and *not* reprecipitated by acids **Cross and Bevan-** The c isolated from vegetable material by successive chlorination and alkali treatment, according to original method of Cross and Bevan **hemi-** See *hemicellulose* **holo-** See *holo* **pseudo-** Hemicellulose c **acetate** The esters of cellulose and acetic acid used extensively in industry (cellit, cellon sicoid, sericose boroid, cellolite) as imitation leather, fabrics, yarns, hairs, bristles, gold leafs, filaments, sponges, films, wind shields, phonograph records, aeroplane dopes, solid alcohol or cigar tips **(mono-)** $C_6H_9O_4 COOMe$ = 205 00 C monoacetate **(di-)** $C_6H_8O_3(COOMe)_2$ = 246 11 C diacetate **(tri-)** $C_6H_7O_2(COOMe)_3$ = 288 19 C triacetate A colorless, amorphous, white mass, insoluble in water, alcohol or ether **(tetra-)** $C_6H_6O(COOMe)_4$ = 330 17 C tetraacetate White, amorphous mass, softening 150, insoluble in ordinary solvents **(penta-)** $C_6H_5(COOMe)_5$ = 372 24 C pentacetate White amorphous mass, insoluble in water, soluble in alcohol **c nitrate** The esters of cellulose and nitric acid, used extensively in explosives and in the lacquer industry under the misnomer *nitrocellulose* There exist, according to the degree of nitration **(tri-)** $C_{12}H_{17}O_7(NO_3)_3$ = 459 23 C trinitrate **(tetra-)** $C_{12}H_{16}O_6(NO_3)_4$ = 504 23 C tetranitrate Both are white amorphous masses, d 1 66, insoluble in ordinary solvents, soluble in absolute alcohol or glacial acetic acid They are the principal constituents of collodion **(penta-)** $C_{12}H_{15}O_5(NO_3)_5$ = 549 23 C pentanitrate White amorphous substance, d about 1 66, insoluble in alcohol, benzene, ether, soluble in a mixture of alcohol and ether **(hexa-)** $C_{12}H_{14}O_4(NO_3)_6$ = 594 23 C hexanitrate The principal constituent of gun-

cotton. White amorphous substance, d.1.66, ignites about 160, insoluble in ordinary solvents.

celotex. A structural insoluting material or wall board produced by pressing bagasse or other fibers; d.0.19–0.24, tensile strength 26.2Kg./cm.^{2}

celsian. A barium feldspar, $BaAl_2Si_2O_8$.

Celsius, Anders. 1701–1744. A Swedish astronomer who originated the celsius thermometer scale. **C. scale.** A thermometer scale from which developed the centigrade scale (q.v.).

celtium. Ct. A supposed element (at. no. 72) of the rare earth group, discovered by Urbain and Dauvillier in zirconium minerals. Cf. *hafnium.*

cement. (1) A plastic material which hardens and forms a firm connecting medium between two or more solids. (2) Portland cement. A fine gray powder, probably containing $3CaO.SiO_2$, $3CaO.Al_2O_3$, and $2CaO.SiO_2$. It is made by mixing and grinding a calcareous material (limestone, marl or chalk) with an argillaceous one (clay or shale, $Al_2O_3.SiO_2$), and heating it in ovens to 1350–1800°C until it begins to vitrify. The clinker thus produced is pulverized, mixed with 2 % gypsum, and ground to 200-mesh. The composition is: CaO 62–67, SiO_2 18–20, Al_2O_3 4–8, Fe 2–3, Mg 1–4, K, Na 0.5 %, Ti, Mn traces. Used for concrete, which is made by mixing 1 part cement, 2 parts sand and 4 parts of gravel, and for each 100 pounds of cement 6 gallons of water. The resulting concrete, properly handled will have a crushing strength of 3000 lbs. after one month and 4000 lbs. or more after a year. **adamantine-** A mixture of powdered pumice stone with silver amalgam, used in dentistry to fill cavities of teeth. **bituminous-** Cement prepared from natural pitch. **chalcedony-** A mortar and cement made from chalcedony. **clinker-** Uncrushed portland cement. **copper-** Dental c. **dental-** See *dental c.* **glass-** A mending material for broken glass, as a mixture of resins. **glycerin-** A glue containing glycerin. **hydraulic-** A cement that sets under water, as Portland cement. **porcelain-** A substance used to mend porcelain. **portland-** A hydraulic cement made by calcining limestone and clay or rivermud. **quick-setting-** A mixture of 11–20 % alkyd resin, 35 % of nitrocellulose solution, 11–21 % solvent and 4–8 % plasticizer. **refractory-** See *refractory c.* **roman-** A quick-setting cement obtained by mixing burnt clay with lime and sand. **rubber-** A mixture of un-vulcanized rubber and sulfur dissolved in oil; used for coating objects. **silicate-** See *dental c.* **zinc oxide-** See *dental c.*

cementation. (1) The setting or hardening of a plastic material. (2) Heating wrought iron in a bed of charcoal or hematite, and its conversion into steel, (blister steel). (3) Heating one metal in contact with another, and production of a coating of the latter.

cementing. To bind together. **c. electron.** Electrons of the atomic nucleus which hold protons together.

cementite. The iron carbide, Fe_3C, which occurs in steel.

cenospheres. An opaque spherical structure in coal.

cent. A contraction of the Latin centum (a hundred), or centesimus (a hundredth).

Centaurea. A genus of composite herbs, containing 470 species, *e.g., C. behen,* behenic acid; *C. jacca,* centaurin; *C. cyanus,* cyanin.

centaureidin. $C_{18}H_{18}O_8$ = 362.2. A flavone decomposition product of centaurin.

centaurin. A glucoside from the roots of *Centaurea jacea.*

centaurine. An alkaloid from *Erythrea centaurium.*

centaury. The various species of *Erythraea,* used for general tonic preparations. **American-** Sabbatia.

centi- A prefix denoting $\frac{1}{100}$.

centigrade. A thermometer scale based upon the freezing point (0°) and boiling point (100°) of water. It was originated by Celsius, hence 1°C = 1° centigrade = 1° Celsius.

centigram. The one-hundredth part of a gram: 1 cg. = .01 gm. = 10 mg. (= 0.154 grains troy).

centiliter, centilitre. The one-hundredth part of a liter: 1 cl. = .01l. = 10 mils. or 10 cc. (0.61 in.^{3}).

centimeter, centimetre. The one-hundredth part of a meter: 1 cm. = .01 m. = 10 mm. (0.3937 inches). **cubic-** A cube whose edge is 1 cm. long. It differs from the milliliter which is $\frac{1}{1000}$ part of a liter; thus $\frac{1}{1000}$ liter = 1 ml. = 1.00027 cc. Cf. *cubic centimeter.*

centimeter-cube. Cubic centimeter.

centinormal. N/100. See one hundredth *normal* solution.

centipoise. 0.01 poise (q.v.). A unit of viscosity or fluidity. The viscosity of water at 20°C is taken as 1.00. Cf. *rhe, dissipation.*

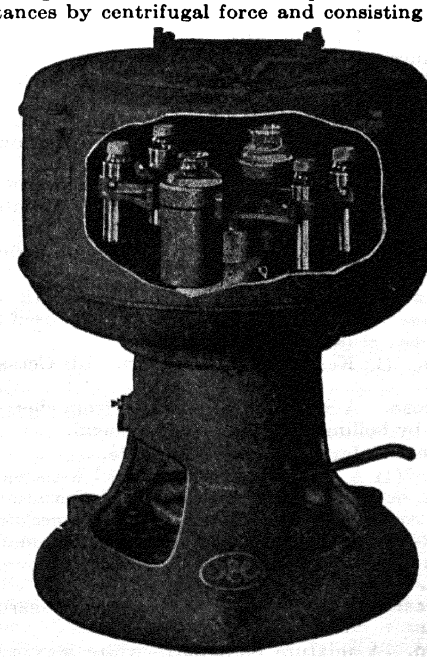
centner. (1) A German standard weight. It equals 50 kg. or 110.2 lbs. (Eng.). (2) A drachm weight divided into 100 equal portions.

centrifugal. Tending to move outwards, away from a center. **c. force.** That tendency of a body moving round another body in a curve to leave its axis of motion.

centrifugalization. Centrifugation.

centrifugation. A process of separating solids from liquids, or liquids of different specific gravity by subjecting them to fast rotation.

centrifuge. A machine for the separation of substances by centrifugal force and consisting of a



Centrifuge.

rapidly rotating container, in which are placed test-tubes, bottles, or large quantities of material **c tube** A heavy walled glass container, which may be graduated, suitable for use in a centrifuge

centrifuging Subjecting to centrifugation

centripetal Antonym of centrifugal Tending to move towards the center

centron The positive nucleus of an atom, Cf *proton*

centrosome A small, round, highly refractive body of protoplasm between nucleus and cell-body, taking an active part in cell division See *karyokinesis*

cephæ See words beginning with *cephae-* and *cepha-*

cephaeline $C_{14}H_{19}O_2N$ = 233 2 An alkaloid from the root of *Cephaelis ipecacuanha* (Rio ipecac) and *Cephaelis acuminata* (Carthagena ipecac) Colorless, white crystals sparingly soluble in water, used as an emetic **c hydrochloride** $C_{14}H_{19}O_2N$ HCl = 269 67 Colorless, white crystals, soluble in water, used as an emetic

Cephaelis A genus of Rubiaceae of Central and South America, which yields ipecacuanha

cephalanthin A glucoside from *Cephalanthus occidentalis* or button-bush, a Rubiaceae of North America

cephaletin An amorphous, bitter principle from swamp dogwood, *Cephalanthus occidentalis*, a Rubiaceae of North America

cephalin (1) Kephalin (2) A white crystalline acid principle from *Cephalanthus occidentalis*

ceptor A characteristic of an organism which is responsible for its transformation, *e g*, amboceptor, chemoceptor, receptor (q v)

cera Wax **c alba** Bleached or white beeswax **c flava** Unbleached or yellow beeswax

ceramic ink A ground mixture of 1 pt K_2CO_3, 1 pt borax, 2 pts litharge and 2 pts cobalt salt Mix with oil to a paste, write on glass or porcelain and burn in with the bunsen burner to produce a permanent marking

ceramics The art of making objects such as vases, reliefs, and pottery, from clay, and burning into them the various metallic colors The chemical composition of c ware is shown by the diagram

cerane $C_{26}H_{54}$ = 366 42 Isohexacosane Colorless crystals, m 61, b $_{0.7mm}$207, insoluble in water

cerargyrite. AgCl Hornsilver, argentum cornu A native isomer of silver chloride

cerasein Cerasin A resin from the bark of *Prunus* (*Cerasus*) *sarotina* (wild cherry), used as diuretic, sedative, and antipyretic

erasin. (1) Kerasin (2) Cerasein (3) Cerasinose

erasinose A carbohydrate derived from cherry-gum by boiling with dilute sulfuric acid

erasite. A Japanese variety of iolite

erate (1) A compound of oil or lard with wax, resin, or spermaceti The official preparations are *camphor-*, *cantharides-*, *lead subacetate-*, *rosin-*, etc (2) A soap or metallic salt made from lard (3) A cerotate

eratin Keratin

eratinase A hydrolytic enzyme from carob beans

eratum A mixture of 3 parts white wax and 7 parts of lard

cerberetin $C_{19}H_{26}O_4$ = 318 3 A decomposition product of cerberin A citron-yellow powder, m 85

cerberidin A glucoside from *Thevetia cerbera* A yellow, amorphous powder, soluble in water and used as a substitute for digitalis

cerberin $C_{27}H_{44}O_8$ = 492 4 A glucoside from the seeds of *Cerbera odallam* and *Thevetia neriifolia*, an Apocynaceae of the East Indies, used as a substitute for senna Cf *odallin*, *thevetin*

cereal (1) An edible seed of Gramineae, *e g*, wheat, rye, oats, rice, maize, barley (2) A preparation of (1)

cerealin An enzyme or protein contained in bran, and similar to diastase, it converts starch into glucose

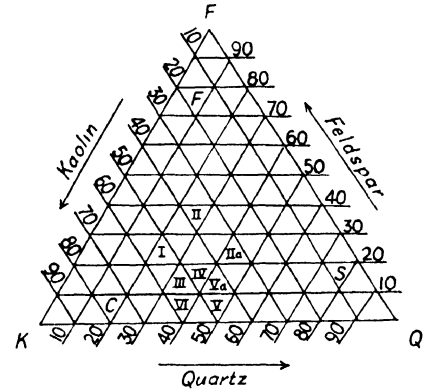
cerebral Pertaining to the brain **c excitants** Drugs which stimulate the brain to activity **c depressants** Drugs which temporarily suspend or depress the functions of the brain

cerebric acid A fatty acid from the white substance of brain tissue

cerebrin $C_{17}H_{33}O_3N$ = 299 4 A colorless, fatty principle, obtained from brain tissue by boiling with barium hydroxide

cerebrine Cerebrum siccum Dried brain substance, used in the treatment of neurasthenia

cerebron $C_{40}H_{81}O_6N$ = 671 8 An amino lipotide from the white brain tissue



Ceramic ware

I = hard porcelain
II = soft porcelain
III = Japanese porcelain
IV = stoneware
V = whiteware
Va = German whiteware
VI = calcareous whiteware
C = clay
S = sand
F = feldspar

cerebronic acid $C_{25}H_{50}O_3$ = 478 5 and $C_{24}H_{48}O_3$ = 466 5 A mixture of α-hydroxy-pentacosanic acid and α-hydroxytetracosanic acid, m 80 5, obtained by hydrolysis of the white brain substance

cerebrose $C_6H_{12}O_6$ Brain sugar A carbohydrate of brain tissue, identical with galactose

cerebroside Galactoside A group of nitrogeneous, fatty substances found in the white

matter of the brain, free from phosphorus, and containing galactose and a complex fatty acid Cf , *phrenosin, sphingosine, kerasin, cholane ring, carotenoids*

Mosander in 1839 Cerium forms two series of compounds with valencies

+3 cerous-	Ce^{+++}
+4 ceric-	Ce^{++++}

CEREBROSIDES

$$Me(CH_2)_7CH_2\ CH_2(CH_2)_{12}CH_2CONH\ CH_2\ CH\ CHOH\ CH\ CH(CH_2)_{12}Me$$

a *b* *R*

kerasin (as shown) *R* is —O—CH(O—CH(CH$_2$OH)—CHOH—CHOH)CHOH

phrenosin *b* is CHOH (instead of CH_2)

nervon *a* is CH ⁄CH (instead of $CH_2\ CH_2$)

cerebrospinal Pertaining to the brain and spinal cord

cerebrospinase An oxidizing ferment in the cerebro spinal fluid

ceresin Earth wax, ozocerite A purified mineral wax (ozokerite), m 58, d 0 753 Used as a substitute for beeswax, sometimes hard paraffin wax is added to it

cerevisin A dried brewer's yeast derived from the yeast *Saccharamyces cerevisiae*

cerevisterol A sterol from yeast, m 265 3 Cf *ergosterol, cholane ring*

ceria Cerium dioxide

ceric (1) A compound containing tetravalent cerium Ce^{++++} (2) Pertaining to wax **c. acid** Cerotic acid **c ammonium nitrate** $Ce(NO_3)_4\ 2NH_4NO_3$ = 548 3 Small, orange crystals, very soluble in water or alcohol, and readily reduced to cerous compounds, used in the preparation of pure cerous salts **c fluoride** $CeF_4\ H_2O$ = 224 13 An amorphous white powder, insoluble in water, used in ceramics **c hydroxide** $Ce(OH)_4$ = 208 0 A yellow powder, insoluble in water, slightly soluble in acids or alkalis **c nitrate** $Ce(NO_3)_4$ = 388 3 Orange, hygroscopic crystals, soluble in water or alcohol **c oxide** CeO_2 = 172 3 Cerium dioxide, ceria A light yellow powder, d 7 65, m 1950, insoluble in water, soluble in concentrated sulfuric acid, used in ceramics and Welsbach mantles **c sulfate** $Ce(SO_4)_2\text{-}4H_2O$ = 404 5 White or yellow needles, soluble in water, decomp in excess with the formation of a basic salt Used as reducer in photography, and in analytical chemistry as an oxidizing agent for vanadyl ions and in the volumetric determination of hydroquinone

ceride A tertiary lipid formed by the union of higher monovalent alcohols and fatty acids

ceridin Cerolin

cerin (1) $C_{30}H_{50}O_2$ = 442 3 A sterol and constituent of cork, colorless, small, acicular crystals (2) Cerotic acid

cerinic acid Cerotic acid

ceriometry Volumetric analysis with ceric sulfate solution

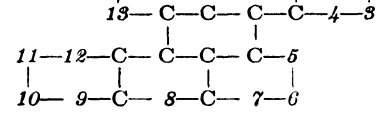
cerite A native hydrous silicate of the rare earths, found in the gneiss at Bastnaes, Sweden, which also contains cerium, lanthanum, and didymium **fluo-** Fluocerite

cerium Ce = 140 13 A rare earth element, atomic number 58 An iron-gray, ductile, malleable metal, d 7 042, m 623, b 1400, it burns in air like magnesium, decomp in water, and is readily soluble in acids It occurs as silicate (cerite and allanite) and phosphate (monazite), together with other rare earth metals It was discovered in 1803 by Klaproth, independently by Berzelius and Hisinger, and first isolated by Mosander in 1839 Cerium forms two series of compounds with valencies

+3 cerous-	Ce^{+++}
+4 ceric-	Ce^{++++}

The metal is prepared by electrolysis of the fused chloride, and is used in alloys for gas-lighters (mischmetall) and other pyrophoric or spark-producing metals, for machine gun tracer bullets, as "getter" of noble gases in radio tubes as scavenger in steel making, and for flash light powders The compounds are poisonous, and are used in large quantities for incandescent gas mantles **c compounds** See under *ceric* and *cerous* **c dioxide** Ceric oxide

cerodi- A prefix indicating the heptacyclic ring structure



as in

cerodiamidine, *8* and *16* are N
cerodioxene, *8* and *16* are O
cerodithiene, *8* and *16* are S

cerolein A constituent of bees-wax, soluble in cold alcohol

cerolin Ceridin A fatty constituent of yeast, used in the treatment of acne

ceromel Honey in the comb, or a mixture of wax and honey

ceromelissic acid $C_{31}H_{60}O_2$ = 494 6 An acid, m 94, from lardacein

ceropic acid $C_{36}H_{68}O_{30}$ = 980 7 A white microcrystalline acid from the needles of *Pinus sylvestris* a Coniferae

ceroplastic acid $C_{33}H_{70}O_2$ = 498 6 An acid m 97, from lardacein

cerosate A compound containing the monovalent radical, $C_{23}H_{47}COO$—, derived from cerosic acid

cerosic acid $C_{23}H_{47}COOH$ = 368 5 Tetracosanic acid A fatty acid, m 85, from cerosin

cerosin Cerosinyl cerosate A wax found as coating on sugar cane

cerosinyl The radical, $C_{24}H_{49}$—, derived from cerosic acid

cerotate A compound containing the monovalent $C_{26}H_{53}COO$— radical, derived from cerotic acid Cf *carnauba wax*

cerotene $C_{27}H_{54}$ = 378 5 An unsaturated hydrocarbon from wax Cf *cerylene, carotene*

cerotic acid (1) $C_{26}H_{53}COOH$ = 410 5 Cerotinic acid, heptacosanoic acid* cerotin, cerinic acid The monobasic, fatty acid of wax A white, amorphous powder, or small granules, m 82 5, insoluble in water soluble in alcohol Cf *neocerotic acid* (2) $C_{25}H_{51}COOH$ = 396 41

Hexacosanoic acid* White needles, d 0 836, m 88, insoluble in water

cerotin Ceryl cerotate

cerotinate Cerotate

cerotinic acid Cerotic acid

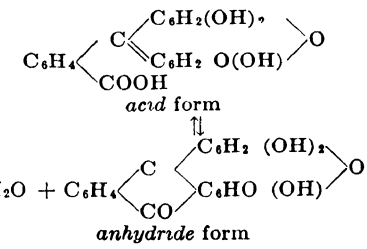
cerotol Ceryl alcohol

cerous Containing trivalent cerium, Ce^{+++} **c acetate** $Ce(C_2H_3O_2)_3$ H_2O = 335 2 White crystals m 115 soluble in water **c ammonium nitrate** $Ce(NO_3)_3$ $3NH_4NO_3 10H_2O$ = 681 56 Large transparent crystals, soluble in water or alcohol, used in the manufacture of Welsbach mantles **c benzoate** $Ce(C_7H_5O_2)_3$ = 503 3 A white powder, soluble in hot water or alcohol **c bromate** $Ce_2(BrO_3)_6$ $9H_2O$ = 1070 4 White crystals, very soluble in water **c bromide** $CeBr_3$ $7H_2O$ = 506 1 White, hygroscopic crystals, very soluble in water or alcohol **c carbonate** $Ce_2(CO_3)_3$ $5H_2O$ = 550 4 A white powder, insoluble in water but soluble in ammonium carbonate solution or dilute acids **c chloride** $CeCl_3$ = 246 6 White crystals, $d_{15°}$ 3 88, m 848, soluble in water or alcohol (**cryst**) $CeCl_3$ $7H_2O$ = 372 7 Large, slightly pink, transparent crystals, very soluble in water or alcohol, used in the manufacture of Welsbach mantles **c citrate** $CeC_6H_5O_7$ = 329 4 A white powder, insoluble in water, soluble in dilute acids **c fluoride** CeF_3 = 197 13 Colorless crystals, d 5 8, m 1324, slightly soluble in water **c hydroxide** $Ce(OH)_3$ = 191 2 A yellowish powder, insoluble in water, soluble in acids **c hypophosphite** $Ce(H_2PO_2)_3$ H_2O = 353 3 A white powder, insoluble in water, soluble in dilute acids, used medicinally for phthisis **c iodide** CeI_3 $9H_2O$ = 682 7 White or pink crystals, very soluble in water or alcohol **c lactate** $Ce(C_3H_5O_3)_3$ = 407 5 A white powder, sparingly soluble in water **c malate** $Ce_2(C_4H_4O_5)_3$ = 676 5 A white powder, soluble in water **c. nitrate** $Ce(NO_3)_3$ $6H_2O$ = 434 5 White, transparent crystals, very soluble in water or alcohol, used in making Welsbach mantles **c oxalate** $Ce_2(C_2O_4)_3$ - $9H_2O$ = 706 8 A pinkish, crystalline powder, usually containing La and Pr salts, insoluble in water Used as a raw material in the preparation of rare earths, and medicinally as a sedative and tonic **c oxide** Ce_2O_3 = 328 5 A gray powder, d 6 9, insoluble in water, soluble in acids **c phosphate** $CePO_4$ = 235 3 Yellowish, rhombic crystals $d_{14°}$ 5 92, insoluble in water or acids **c salicylate** $Ce(C_7H_5O_3)_3$ = 551 5 A white powder, insoluble in water **c sulfate** $Ce_2(SO_4)_3$ = 568 7 Monoclinic or rhombic crystals, d 3 912, soluble in water (**cryst**) $Ce_2(SO_4)_3$ $8H_2O$ = 713 1 Pinkish, small crystals, soluble in water, used to prepare aniline black **c valerate.** $Ce(C_5H_9O_2)_3$ = 443 5 A white powder, sparingly soluble in water

ceroxylin $C_{20}H_{32}O$ = 288 26 A crystalline substance found in the waxy exudation of *Ceroxylon andicola*, the wax palm of South America

certified Describing an instrument, especially a measuring device such as a buret or pipet, which has been tested in an official laboratory and its correctness recorded on a certificate Cf *standardized*

cerulein Coerulein $C_{20}H_{12}O_7$, or $C_{20}H_{10}O_6$ - H_2O = 364 14 A coloring matter from gallein, which exists as a normal acid and as an internal anhydride



ceruleum A blue pigment consisting of cobaltous stannate and calcium sulfate

cerulic acid An oxidation product of coffee

cerulignone $C_{16}H_{16}O_6$ = 304 0 Cœrulignone, *3 3′ 5 5′*-tetramethoxydiphenoquinone, cedriret Dark, steel-blue needle-shaped crystals, obtained by treating crude pyroligneous acid with potassium dichromate **hydro-** Hydrocerulignone

cerumen Wax from the human ear

cerusa, ceruse, cerussa White lead

cerussite $PbCO_3$ A white native lead carbonate and common mineral, produced by the action of CO_2 and water on lead ores

cervantite Sb_2O_4 A native antimony tetroxide secondary mineral formed by the oxidation of antimony sulfide

ceryl The monovalent radical, $C_{26}H_{53}$—derived from ceryl alcohol **c alcohol** $C_{26}H_{54}O$ = 382 43 *1*-Hexacosanol*, cerotin, *n*-hexacosyl alcohol A monatomic alcohol derived from Chinese wax and wool fat Colorless crystals, m 79, insoluble in water, soluble in alcohol or ether **(iso-)** An isomeric alcohol from Java wax White crystals, m 62, insoluble in water soluble in alcohol or ether **c cerotate** $C_{53}H_{106}O_2$ = 774 80 An ester of ceryl alcohol and cerotic acid, $C_{26}H_{53}OOC\ C_{26}H_{53}$ Colorless crystals, m 84, forming the main portion of Chinese wax **c palmitate** $C_{42}H_{84}O_2$ = 620 8 An ester of ceryl alcohol and palmitic acid, $C_{15}H_{31}COO\ C_{26}H_{53}$, and a constituent of opium wax

cerylate A compound containing the monovalent $C_{27}H_{55}O$— radical, derived from ceryl alcohol

cerylene $C_{47}H_{94}$ = 378 54 A hydrocarbon distilled from Chinese wax, which resembles paraffin Cf *cerotene*

cerylic Ceryl

cesiated Coated with cesium, as, the cathode of a thermionic discharge device

cesium, cæsium Cs = 132 91 A rare element of the alkali family, atomic number 55 A silver-white, soft, metal which resembles sodium, d 187, m 26 4, b 670, and reacts violently with water It is the most electro-positive element, and has a valency of one Cesium occurs in small quantities in a few mineral waters and minerals and in the ashes of a few plants, and is prepared by the distillation of cesium hydroxide with magnesium powder in a stream of hydrogen gas It was discovered by Kirchhoff and Bunsen in 1860 by means of the spectroscope, and isolated in 1881 by Setterberg Cesium metal is a substitute for rubidium, *q v*, and its salts are used as reagents in microchemistry, as a getter or gas absorbent in radio tubes, as a source of metallic vapor in power tubes, as a sensitive coating in photoelectric cells, and medicinally as an anti-shock compound in administering arsphenamine

c acetate $CsC_2H_3O_2$ = 191 93 Deliquescent white crystals, m 194, soluble in water, alcohol or ether **c alum** C aluminum sulfate **c aluminum sulfate** $Cs_2Al_2(SO_4)_4 \cdot 24H_2O$ = 1136 50 C alum Colorless crystals, soluble in water **c ammonium bromide** CsBr NH_4Br = 309 68 A white, crystalline powder, soluble in water, used as a nerve-sedative in epilepsy **c ammonium chloride** CsCl $3NH_4Cl$ = 328 75 A white, crystalline powder, soluble in water **c antimonous chloride** $6CsCl \cdot SbCl_3$ = 1131 5 Antimony c chloride Cesium chlorostibate, (Cs_6SbCl_9) A yellowish, crystalline powder, slightly soluble in water **c benzoate** $CsC_7H_5O_2$ = 253 85 A white powder, very soluble in water **c bicarbonate** $CsHCO_3$ = 193 8 White crystals soluble in water **c bisulfate** $CsHSO_4$ = 229 8 C acid sulfate White crystals, soluble in water **c bitartrate** $CsHC_4H_4O_6$ = 281 85 C acid tartrate White rhombic crystals, soluble in water **c bromate** $CsBrO_3$ = 260 8 White crystals soluble in water **c bromide** CsBr = 212 7 A colorless, crystalline powder, $d_{21}°$ 4 455, soluble in water, used medicinally for heart disturbances due to nervousness **c carbonate** Cs_2CO_3 = 325 6 White hygroscopic crystals, soluble in water or alcohol, used in breweries and in soda-water manufacture **c carbonate, acid** C bicarbonate **c chlorantimonate** C antimonous chloride **c chloride** CsCl = 168 3 Colorless, regular crystals, $d_{20}°$ 3 972, m 646, it sublimes on further heating, soluble in water, alcohol, or ether Used in breweries and in soda-water manufacture **c chloroplatinate** Cs_2PtCl_6 = 674 0 Pale yellow octahedra, soluble in water **c chromate** Cs_2CrO_4 = 381 7 Yellow crystals, soluble in water **c cyanide** CsCN = 158 8 White crystals, soluble in water **c dichromate** $Cs_2Cr_2O_7$ = 481 8 Yellowish-red crystals, soluble in water **c fluosilicate** Cs_2SiF_6 = 407 4 C silicofluoride White, regular crystals, $d_{17}°$ 3 375, soluble in water **c formate** $CsCHO_2$ = 177 82 Deliquescent white powder, m 265 very soluble in water The *monohydrate* loses H_2O at 41°C **c hydroxide** CsOH = 149 8 A white, grayish or yellowish, molten mass, d 4 018, m 275, it is deliquescent, and very soluble in water **c iodate** $CsIO_3$ = 307 6 White crystals, soluble in water **c iodide** CsI = 259 7 White crystals, $d_{25}°$ 4 51, m 621, soluble in water or alcohol, used medicinally as a substitute for potassium iodide **c ion** The electrically-charged cesium atom, Cs^+, obtained in solutions of soluble cesium salts **in water c manganese chloride** $2CsCl \cdot MnCl_2 \cdot 3H_2O$ = 512 51 C chloromanganite (Cs_2MnCl_4) Pink crystals, soluble in water **c nitrate** $CsNO_3$ = 194 8 Colorless, tetragonal, shining prisms, $d_{28}°$ 3 687, m 414, decomp on further heating, soluble in water, slightly soluble in alcohol, sometimes used in pyrotechnics **c nitrite** $CsNO_2$ = 178 8 White crystals, soluble in water **c oxalate** $Cs_2C_2O_4$ = 353 62 A white powder, soluble in water **c oxide** (1) Cs_2O = 281 6 Normal c oxide, c monoxide An orange crystalline powder, $d_9°$ 4 78, soluble in water or alcohol (2) Cs_2O_2 = 297 6 C dioxide (3) Cs_2O_3 = 313 6 C trioxide (4) Cs_2O_4 = 329 6 C tetroxide, c peroxide **c perchlorate** $CsClO_4$ = 232 2 White crystals, soluble in water **c periodate** $CsIO_4$ = 323 6 White crystals, soluble in water **c permanganate** $CsMnO_4$ = 251 8 Violet prisms, soluble in water **c peroxide** Cs_2O_4 = 329 6 C tetroxide A yellow granular powder decomp violently in water **c platinic chloride** C chloroplatinate **c rubidium alum** C rubidium aluminum sulfate **c rubidium aluminum sulfate** $CsRb(SO_4)_2 \cdot 24H_2O$ = 1064 93 C rubidium alum Colorless crystals, soluble in water **c rubidium ammonium bromide,** $CsBr \cdot RbBr \cdot 6NH_4Br$ A white, crystalline powder, soluble in water, used as a nerve sedative **c rubidium bromide** CsBr RbBr = 378 10 A white, crystalline powder, soluble in water, used medicinally as a substitute for potassium bromide **c rubidium chloride** CsCl RbCl = 289 18 A yellowish, crystalline powder, slightly soluble in water **c salicylate** $CsC_7H_5O_3$ = 269 85 A white powder, very soluble in warm water **c silicofluoride** C fluosilicate **c sulfate** Cs_2SO_4 = 361 7 Colorless needles, d 4 24, soluble in water, insoluble in alcohol Used in breweries and in soda-water manufacture **c sulfide** There are several sulfides, but none is used industrially (1) Cs_2S = 297 6 C monosulfide (2) Cs_2S_2 = 329 6 C disulfide (3) Cs_2S_3 = 361 6 C trisulfide (4) Cs_2S_5 = 425 6 C pentasulfide **c sulfite** Cs_2SO_3 = 345 6 White crystals, soluble in water **c tartrate, acid** C bitartrate **c tetroxide** C peroxide **c trinitride** CsN_3 = 175 0 Used as getter in radio tubes **c trisulfide** See *c sulfide*

cespitine $C_5H_{13}N$ = 87 1 A base obtained from coal tar, and isomeric with amylamine

cetaceum Spermaceti

cetane $C_{16}H_{34}$ = 226 25 Hexadecane * A hydrocarbon of the paraffin series, colorless solid, d 0 775, m 20, b 287 5

cetate A salt of cetic acid

cetene $C_{16}H_{32}$ = 224 33 Cetylene *2*-hexadecyne*, Δ^1-hexadecene, hexadecylene $CH_2 \cdot CH(CH_2)_{13}CH_3$ An unsaturated hydrocarbon d 0 789, m 4, b 274, obtained from cetyl alcohol by treatment with P_2O_5

cetenylene $C_{16}H_{30}$ = 222 23 An unsaturated hydrocarbon and homolog of heptine Cf *hexadecine*

cetic A compound containing the monovalent $C_{16}H_{33}$— radical

cetic acid $C_{15}H_{30}O_2$ = 242 23 A fatty acid from spermaceti

cetin $C_{15}H_{31}COOC_{16}H_{33}$ Cetylcetylate The cetic acid ester, and principal constituent of spermaceti A colorless, crystalline mass, m 50, b 360, insoluble in water, soluble in alcohol or ether

cetol Cetyl alcohol

cetoleic acid $C_{22}H_{42}O_2$ = 338 4 An unsaturated, monobasic acid, $Me(CH_2)_9CH{:}CH(CH_2)_9COOH$, an isomer of erucic acid it is a constituent of marine animal (whale, codliver, shark, herring) oils

Cetraria (1) A genus of lichens (2) Iceland moss

C vulpina	vulpic acid
C islandica	Island moss, cetrarin

cetraric acid $C_{18}H_{16}O_8$ = 360 2 A crystalline dibasic acid from Iceland moss

cetrarin $C_{30}H_{30}O_{12}$ = 582 3 Cetrarinic acid A white, crystalline, bitter principle of Iceland moss, insoluble in water, but soluble in hot

alcohol, carbonate or hydroxide solutions Used in anemia, chlorosis, and phthisis as a blood-forming agent, it is also a stomachic and expectorant **c base** A brown, amorphous mixture of cetrarin, cetraric acid, stearic acid, and other substances from Iceland moss, used similarly to cetrarin

cetrarinic acid Cetrarin

cetyl Hexadecyl The monovalent radical, $C_{16}H_{33}$—, isomeric with the cetic radical **c alcohol** $C_{16}H_{33}OH$ = 242 35 Ethal, cetylic alcohol, *1*-hexadecanol*, cetol, primary hexadecyl alcohol, pentadecylcarbinol A colorless, tasteless, waxy powder, m 39 5, b 344, $d_{50°}$ 0 808, insoluble in water, soluble in alcohol or ether, and used for eczema **c amine** $C_{16}H_{33}NH_2$ = 241 26 Hexadecylamine Colorless substance insoluble in water **c cyanide** Margaronitrile **c ether** $C_{32}H_{66}O$ = 466 51 *1*-Hexadecyl oxyhexadecane*, hexadecyl ether $(C_{16}H_{33})_2O$ White leaflets, m 55, slightly soluble in water **c iodide** $C_{16}H_{33}I$ = 352 3 *1*-Iodohexadecane* Colorless scales, m 22, insoluble in water soluble in alcohol or ether

cetylate (1) A salt of palmitic acid containing the monovalent $C_{15}H_{31}COO$— radical (2) A compound derived from cetyl alcohol containing the monovalent $C_{16}H_{33}O$— radical

cetylene Cetene

cetylic acid Palmitic acid

cetylide $(C_{15}H_{31}O_2)_3C_{16}H_{18}(OH)_3$ = 1026 01 A compound formed by the hydrolysis of cerebrin

cevadate A salt of cevadic acid containing the monovalent C_4H_7COO— radical

cevadic acid $C_5H_8O_2$ = 100 01 Methyl crotonic acid, tiglic acid A constituent of cevadin

cevadilla Sabadilla

cevadilline Sabadilline

cevadine $C_{32}H_{49}O_9N$ = 591 5 The veratrine of Merck An alkaloid from the seeds of sabadilla Colorless needles, m 205, insoluble in water, soluble in alcohol or ether Decomp by hot KOH to cevine and cevadic acid

cevilline $C_{29}H_{47}O_7N$ = 521 5 An alkaloid produced by the saponification of cevadilline

cevine $C_{27}H_{43}O_8N$ = 509 5 An alkaloid produced by the hydrolysis of cevadine

cevitamic acid Vitamin C

cevollite A fibrous zeolite alteration-product of melilite

ceyssatite A white earth consisting of almost pure silica from Ceyssat, France, used as an absorbent powder in eczema

Cf Abbreviation for, confer or compare

Cg Abbreviation for centigram

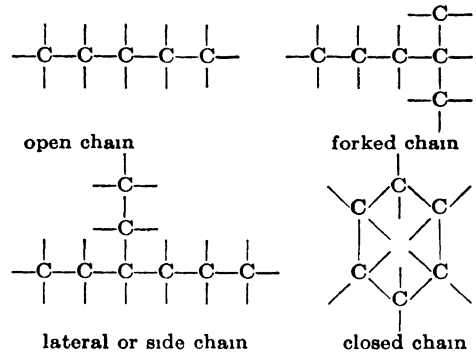
C G S or **c g s** An abbreviation for centimeter-gram-second units, (1874)

Ch Abbreviation for chain

chabazite $CaAl_2Si_4O_{12}\ 6H_2O$ Phacolite, cabazite A zeolite, sometimes produced artificially by the action of water on cement Cf *acadialite, gmelinite*

Chaddock burner A small furnace made of pottery and used as a non-corrosive gas burner **C clamp** A wooden test tube holder **C support** A burette stand with wire springs for holding two burettes

chain (1) A series of connected successive events or substances, as in chain reaction, or periodic chain (2) A number of similar atoms linked together by homopolar bonds, as in a carbon chain (3) A measure of length 1 chain = 4 rods = 100 links = 20 11684 m **branched-** See (1) lateral- (2) forked- **carbon-** A series of connected C-atoms **closed-** A ring formed by a chain of atoms, *e g*, the benzene ring



forked- A branch of two smaller chains from the end atom of a longer chain **lateral-** A branch chain in the middle of a longer chain **open-** A number of atoms joined together in a line **periodic-** See *periodic system* **side-** (1) Lateral c (2) Usually applied to a chain attached to a ring (3) An atomic group of the protoplasm which reacts with a non-protoplasmic group See *Ehrlich theory* **straight-** An open c with no forks or branches

c reaction A series of successive reactions, each of which depends upon the preceding one, generally of the type 1, a, b, a, b, where 1 is the initial reaction and a and b the c reactions which take place so long as reagents are present Two types

A Matter chain

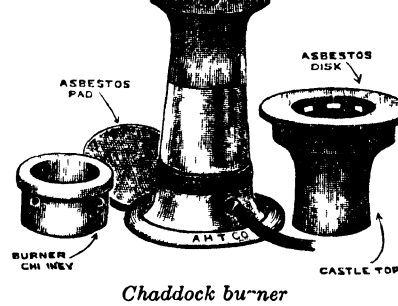
(1) $Cl_2 + E = 2Cl$
(a) $Cl + H_2 = HCl + H$
(b) $H + Cl_2 = HCl + Cl$

B Energy chain

(1) $Cl_2 + E = Cl_2^*$
(a) $Cl_2^* + H_2 = HCl^* + HCl$
(b) $HCl^* + Cl_2 = Cl_2^* + HCl$

In both cases the result is

$$xCl_2 + xH_2 \rightarrow 2xHCl$$



Chaddock burner

chainomatic An analytical balance on which no separate weights for less than 0 1 gm are used The weight of a substance is determined by adjusting the length of the fine chain that hangs from one of the arms of the beam, and measuring this length on a perpendicular scale

chains Describing a growth of bacteria in the form of a chain **long-** A c consisting of more than eight bacteria **short-** A c composed of two to eight bacteria

chalcacene $C_{30}H_{20}$ = 380 15 A pyrolytic product from acenaphthene Red needles with bronze lustre, m 359, isomeric with rhodacene

chalcanthite $CuSO_4 5H_2O$ A native, blue, crystalline copper sulfate formed by the evaporation of cupriferous mine waters

chalcedony A cryptocrystalline and amorphous form of silica, SiO_2 or quartz, which occurs in a variety of colors and shapes and is sometimes used as a semi-precious stone

agate—banded forms
cornelian—opaque variety
chrysoprase—green opaque variety
bloodstone—dark opaque variety with blood red spots
jasper—red, green, or black varieties
silicified wood—jasper-like variety
moss agate—milky variety, with dendritic markings of manganese oxide which resemble plants
onyx—a variety of agate, with straight alternating light and dark bands
plasma—green mottled variety
prase—gray-green variety
sardonyx—golden or blood-red variety

chalcedonyx A variety of white and gray layered agate

chalcocite Cu_2S A native copper sulfide, d 5 5–5 8

chalcomorphite A native, hydrous, calcium aluminum silicate

chalcone (1) $C_{15}H_{12}O$ = 208 10 Betaphenylacrylophenone, benzalacetophenone The compound Ph CH CH CO Ph (2) Aralkylic ketones A group of natural yellow and orange substituted benzalacetophenone derivatives of the type Ar CO CH CHAr′, as, curcumin, eriodictyol, hesperitin and maringinin Cf *flavones*

chalcophanite ZnO $2MnO_2$ $2H_2O$ A metallic bluish-black zinc manganite

chalcophyllite $Cu_7As_2O_{12}$ $14H_2O$ A native copper arsenate produced by the oxidation of enargite, occurs in hexagonal, green, transparent crystals, d 2 4–2 6

chalcopyrite $CuFeS_2$ A metallic, yellow, copper iron sulfide, d 4 1–4 3

chalcopyrrhotite $CuFe_4S_6$ A brownish-yellow, copper iron sulfide

chalcosiderite $CuFe_6(PO_4)_4$ $8H_2O$ A bright-green native copper *iron* phosphate

chalcostibite $CuSbS_2$ Wolfsbergite A native, metallic, gray, copper sulfantimonide, d 4 8–5 0

chalcuite A bluish-green turquoise from New Mexico

chalk $CaCO_3$ Creta, calcite A native, amorphous, calcium carbonate, deposited from ocean oozes and largely composed of the residues of shells See *calcium carbonate* **French-** A grade of talc

chalking (1) To treat with chalk, *e g* , in the dye industry by passing cotton through a suspension of 6 pts chalk in 1000 parts water (2) To form a powder which is easily rubbed off, *e g* , from paints

chalkogenide A compound containing a chalkogen

chalkogens The elements oxygen, sulfur, selenium and tellurium

chalmersite $CuFe_2S_3$ A native copper iron sulfide

chalybeate A drug or natural water that contains iron salts, used as a blood tonic

chalybite Spathic iron ore A native form of ferrous carbonate Cf *siderite*

chamaeliretin A resin-like substance from chamaelirin

chamaelirin. The bitter principle of false unicorn root, *Chamaelirium luteum*, a Liliaceae, a bitter and poisonous saponin-like glucoside Cf *helonoid*

chamazulene $C_{15}H_{18}$ = 198 14 A blue hydrocarbon from chamomile oil

chamber (1) A boxlike receptacle, **as cloud-** A c making traveling particles visible **fog-** Cloud c **ionization-** A partly evacuated box, with galvanometer for detecting rays (2) The leaded room used in sulfuric acid manufacture, q v **c acid** Impure 60–70 % sulfuric acid from the lead chambers of the c process **c crystals** Nitrosyl sulfate **c process** A process for the manufacture of sulphuric acid in lead chambers from the interaction of sulfur dioxide, air, steam, and oxides of nitrogen

Chamberland, Charles, Edouard 1851–1908 A French bacteriologist **C filter** A porous clay cylinder for filtering bacteria from solutions **C flask** A glass flask with a tubulated side-tube, for growing bacteria

chamelirin Chamaelirin

chamomile A genus of composite plants, especially *Anthemis* species **common- English or Roman-** The flowers of *Anthemis nobilis*, used as a tonic and febrifuge **German-** See Matricaria **wild-** Stinking mayweed The plant *Anthemis cotula* See *anthemidine*

c oil Essential oil from the *Anthemis nobilis* flowers A bluish liquid, d 0 905–0 915, soluble in 6 pts 70 % alcohol It contains esters of butyric angelic and tiglic acids **German-** The essential oil of *Matricaria*, d 0 930–0 940, it contains esters of caproic acid, azulene and chamazulene

chamomillin A bitter principle of chamomile

chamosite A constituent of berthierine

Chamot microscope A microscope designed especially for microchemical work by E M Chamot

champacol $C_{17}H_{30}O$ = 250 24 A camphor from the wood of *Michelia champaca*, a Magnoliaceae of Java Colorless, crystalline needles, or yellowish masses, m 87, insoluble in water, soluble in alcohol or ether

Chandler, Charles Frederick 1836–1925 An American chemist, noted as a teacher and pioneer in the application of chemistry

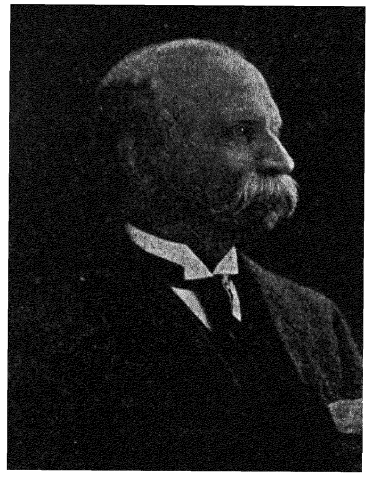
chandoo Chundoo The best quality of raw opium, prepared for smoking by roasting, extraction, evaporation and fermentation Cf *mudat yenshee* **c dross** Yenshee

change of state Passing from the solid to the liquid or from the latter to the gaseous state, or the reverse The change from the solid to the liquid state is **fusion** or **melting**, the reverse change, **freezing** or **solidification** The change from the liquid to the gaseous state is **vaporization** or **boiling**, the reverse change, **condensation** or **liquefaction** The change from the gaseous to the solid state is **sublimation**

Chaperon cell A voltaic cell consisting of amalgamated zinc and copper in a solution of potassium hydroxide, 0 98 volt

Chapman pump. A brass filter pump for attachment to a water faucet.

char. (1) To carbonize or burn incompletely. (2) Charcoal.



Charles Frederick Chandler.

charas. A drug from hemp resin.

charcoal. A form of amorphous carbon derived from the incomplete combustion of animal or vegetable matter (*e.g.*, bones or wood). Used for adsorption of gases or coloring matters etc., in blowpipe analysis and as a pigment (c. black). **activated-** See *activated.* **animal-** C. prepared from bone or blood. **vegetable-** or **wood-** C. prepared by the incomplete combustion of wood. Used medicinally for hyperacidity and some forms of indigestion; commercially, as clarifying and decolorizing agent, and in gas masks. Its source (*e.g.*, wood, nut shells or fruit stones) determines its quality. Cf. *carbonization, norit.*

Chardin filter paper. A filter paper specially prepared for the filtration of agar-agar for culture media.

Chardonnet silk. A rayon (q.v.) made by a viscose process.

charge. (1) A load or burden, *e.g.*, the charge of ore in a furnace, the charge of electricity in a condenser or the charge of carbon dioxide in a soda-water fountain. (2) In physics a definite quantity of electricity. **atomic-** The electricity carried by an atom or ion, which depends on the valency or the number of valence electrons. 1 electron corresponds with 1.1×10^{-19} coulombs. 1 gram-equiv. atom of a univalent element carries 9,6489 coulombs (1 Faraday). **elementary-** The c. of an electron, $e = 4.770 \times 10^{-10}$, q.v. **fictitious-** The quantity of electricity contained in the material of a condenser as distinguished from the true charge of the plates. **ionic-** See *ionic c.* **nuclear-** See *atomic structure.* **residual-** The quantity of electricity remaining in a condenser after discharge. **specific-** The ratio e/m_0. Cf. *electron.*

charging rod. (1) A piece of sealing wax, hard rubber, or glass used for charging electroscopes. (2) A device in which a celluloid tube is rubbed over flannel to charge electroscopes positively or negatively.

chargometer. A hydrometer in a glass syringe with rubber bulb, used for testing the density of the acid in electrical batteries.

Charles, Jacques Alex Caesar. 1746–1822. A French chemist who cooperated in the formulation of the gas laws. **C. law.** Dalton's law, Gay-Lussac law. The volume of a gas at 0°C. increases with each degree centigrade by $\frac{1}{273}$, provided the pressure is constant. The pressure of a gas increases with each degree centigrade by $\frac{1}{273}$, provided the volume is constant. Hence the ratio between the increase in pressure per degree and the value of the pressure at 0°C. (pressure coefficient) is the same for all gases.

Charleston phosphate. A soft phosphate mineral containing 27 per cent of P_2O_5.

charlock. The seeds of *Sinapis* (*Brassica*) *arvensis*, field mustard, used as condiment.

Charlton white. Lithopone.

charpie. Lint.

charring. To carbonize.

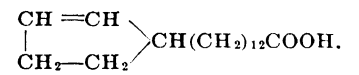
Chatterton's compound. A cement for glass.

chaulmestrol. A brand of ethyl chaulmoograte used in leprosy.

chaulmoogra oil. A yellow oil expressed from the seeds of *Taraktogenos Kurzii* a Bixineae of India, d.0.946–0.951, m.5–20, iodine number 103.5; it contains chaulmoogric, gynocardic and hydnocarpic acids. Used medicinally for leprosy and skin diseases. Cf. *gorli oil, gynocardia oil, maroti oil.*

chaulmoogrene. $C_{18}H_{34}$ = 250.3. n-dococyl-Δ^4-cyclopentane. A hydrocarbon derived from chaulmoogric acid.

chaulmoogric acid. $C_{18}H_{32}O_2$ = 280.3. 1-(α-carboxy-n-dodecyl)-Δ^4-cyclopentene, cyclopentenyl tridecoic acid,



A colorless crystalline acid obtained from chaulmoogra oil, m.68, soluble in alcohol.

chaulmoogryl alcohol. $C_{18}H_{33}OH$ = 266.3. An alcohol obtained from chaulmoogric acid.

chaulmugra. Chaulmoogra.

chavibetol. $C_{10}H_{12}O_2$ = 165.9, allyl-3.4-guajacol, 1-hydroxy-2-methoxy-5-allyl-benzene. A colorless liquid, b.254. **iso-** Betelphenol, 1-hydroxy-2-methoxy-5-propenyl-benzene, a constituent of essential oils. Cf. *eugenol.*

chavicic acid. An amorphous acid obtained from chavicine.

chavicine. An alkaloid from black pepper.

chavicol. $C_9H_{10}O$ = 134.1. p-allyl phenol $C_6H_4(OH)C_3H_5$. A constituent of betel oil; a colorless oil, d.1.035, b.237. **methyl-** Estragole.

chavosot. A p-allylphenol, used in dentistry as a bactericide.

chebulinic acid. (1) $C_{29}H_{23}O_{19}$. A principle from the seeds of *Terminalia chebula*, an East Indian tree. Used as an intestinal antiseptic. (2) $C_{41}H_{34}O_{27}$ = 958.0. An acid derived from tannin. (3) $C_{34}H_{30}O_{23}$ = 806.2. Eutannin. An acid from myrobalans. Rhombic prisms, decomp.234, soluble in hot water, alcohol or acetone.

checkerberry. Gaultheria.

cheese. A food prepared from the casein of skimmed or unskimmed milk, and flavored by the activity of certain bacteria.

cheddite. A high explosive consisting of 70–90 % $KClO_3$, 0–20 % aromatic nitro compounds and 0–15 % paraffin.

cheiramidine $C_{22}H_{26}O_4N_2\,H_2O$ = 400 24 An alkaloid from the bark of *Remijia purdieana*, a Rubiaceae

cheiramine A secondary alkaloid from the bark of *Remijia purdieana*

Cheiranthus Wall-flower The herb *C cheiri*, a Cruciferae which yields alkaloids, glucosides and acids

cheirantic acid An oleic-type acid from the oil of the wallflower, *Cheiranthus cheiri*

cheirantin A glucoside from *Cheiranthus cheiri*, a Cruciferae

cheirin A glucoside of digitalis-like action from *Cheiranthus cheiri*

cheirinine $C_{18}H_{35}O_{17}N_3$ = 567 4 An alkaloid from the leaves of *Cheiranthus cheiri*, a Cruciferae Colorless crystals, sparingly soluble in water

chekan, cheken The shrub *Myrtus cheken*, a Myrtaceae of Chile, its bark is used as an astringent

chekenetin $C_{11}H_7O_6\,H_2O$ = 253 1 Olive colored crystals from the leaves of *Myrtus* (or *Eugenia*) *cheken*, a Myrtaceae of Chile

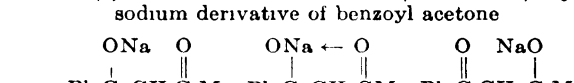
chekenine $C_{13}H_{11}O_3$ = 215 1 A volatile alkaloid from the leaves of *Myrtus cheken*, rhombic yellow scales

chekenone $C_{40}H_{44}O_8$ = 652 4 A crystalline principle from the leaves of *Myrtus cheken*, a Myrtaceae of Chile

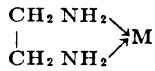
chelafrin Adrenalin

chelate [Greek *chele*—a crab's claw] Pertaining to a molecular structure in which a ring can be formed by the residual valencies (unshared electrons) of neighbouring atoms **c compound** An organic compound in which atoms of the same molecule are co-ordinated In the following examples the arrow indicates co-ordination

(1) Metallic derivatives of β-diketones, *e g*, sodium derivative of benzoyl acetone



(2) Coordinate compounds of metals with ethylene diamine



c groups Atomic groups capable of forming rings by one or two co-ordinate bonds, q v

chelen Ethyl chloride

chelerythrine $C_{21}H_{17}O_4N$ = 347 2 A narcotic alkaloid related to sanguinarine from the seeds of *Chelidonium majus*, a Papaveraceae Red crystals, m 203, slightly soluble in alcohol or ether

chelidamic acid $C_7H_5O_5N$ or $C_5H_3ON(COOH)_2$ = 183 1 3-oxypyridine-1 5-dicarboxylic acid ammonchelidonic acid

chelidonamic acid $C_7H_7O_6N$ = 201 1 An acid derived from chelidonic acid by boiling with ammonia

chelidonate A salt of chelidonic acid containing the divalent $C_7H_2O_6$— radical

chelidonic acid $C_7H_4O_6$ = 184 0 Pyrone dicarboxylic acid An acid from *Chelidonium majus* resembling meconic acid Cf *komanic acid, comenic acid, chelidamic acid*

chelidonine $C_{20}H_{19}O_5N$ = 353 2 An alkaloid from *Chelidonium majus* and opium Colorless shining tablets, m 130, insoluble in water, soluble in alcohol or ether, used as a narcotic **homo-** See *homochelidonine*

c hydrochloride $C_{20}H_{19}O_5N\,HCl$ = 388 67 White crystals, slightly soluble in water or alcohol, and a mild narcotic **c phosphate** A white crystalline powder used as a mild narcotic for stomachic and intestinal pains **c sulfate** $(C_{20}H_{19}O_5N)_2\,H_2SO_4$ = 804 49 A white crystalline powder, soluble in water and used as a sedative (small doses) and stimulant (larger doses)

Chelidonium (1) A genus of papaveraceous plants, *e g*, *C majus*, greater celandine (2) Celandin The leaves and stems of *C majus*, used as a cathartic and for skin diseases Cf *chelerythrine, glaucopicrine*

chelidonoid The combined principles of *Chelidonium majus* It contains chelidonine, chelerythrine, protopine, and other alkaloids*

chelidoxanthine A yellow crystalline bitter principle from *Chelidonium majus*

chelonin A brown, bitter, amorphous powder from *Chelone glabra* (snake head), a Scrophulariaceae used as a tonic

chelonoid The combined principles of *Chelone glabra* used as irritant, cathartic, and anthelmintic

chemavinite Cedarite, Canadian amber A mineral resin from Hudson Bay, containing C, H, O and N

chemical (1) Pertaining to chemistry (2) A substance of definite and known composition, see *chemicals* **c action** A change in the molecular composition of a substance produced either by heat, light, electricity, or by chemical means See *reaction* **c activity** Reactivity **c affinity** See *affinity* **c antidote** A substance that is used to counteract the effect of a poison, *e g*, oils soaps milk, acids, alkalis, albumin, charcoal, carbonates, hydrates, sulfates, starch, or tannin **c burns** The corrosive effect of chemicals on the skin, for

CHEMICAL BURNS

(*Emergency treatment to be applied as soon as possible*)

acids, alkalis	wash with a large amount of water
chromic acid	wash with sodium polysulfide, and follow with tannic acid
cyanides	potassium permanganate or ammonium sulfide
phenol	ethyl alcohol or sodium sulfate solution
phosphorus	solution of copper sulfate, followed by milk of magnesia
sodium	remove the sodium, wash with water and tannic acid solution

emergency treatment see table **c change** Reaction **c compound** See *compounds* **c constitution** See *structure* **c denudation** The process by which the solid salts of the soil are dissolved by water and carried to the sea **c energy** The energy relations of chemical reactions Intensity is expressed by chemical affinity or chemical potential, whilst the capacity is expressed by the equivalent weight or the active mass of substance **c entities** The fundamental concepts of chemistry, as, atoms, ions, molecules and free radicals **c equation** The expression of a chemical reaction in terms of chemical formulas, *e g*,

A + B	=	C + D
reacting substances		reaction products

(ionic-) The general statement of a chemical reaction which shows only those substances actually undergoing a change, thus

$$Ba^{++} + SO_4^{--} = BaSO_4$$

(molecular-) The specific statement of a chemical reaction showing the relative proportions of substances used, thus

$$BaCl_2 + H_2SO_4 = BaSO_4 + 2HCl$$

c microscopy The utilization of the microscope in chemistry, *e g*, for identification of substances, qualitative and quantitative analysis, determination of melting and subliming points, and refractive indexes and the behavior of substances in polarized light **c pulp** Wood treated by the soda, sulfite, or sulfate process for paper making **c reaction** See *reaction* **c shorthand** See *symbols* **c slide rule** An adaptation of the slide-rule for chemical calculations, and including chemical symbols and the atomic and molecular weights of the common substances See *slide rule* **c societies** The largest are in order of foundation

Chemical Society of London	founded 1841
Société Chimique de Paris	founded 1858
Chemische Gesellschaft, Berlin	founded 1867
American Chemical Society, Washington	founded 1876

c solvents See *solvents* **c system** An equilibrium established by the interaction of substances It is characterized by the presence of definite proportions of the reacting substances and of their reaction products Cf *phase rule, system*

hemicals A compound or a substance of a definite molecular composition Generally the term *chemical* is restricted to a substance consisting of a single molecular species, while the term *drug* refers to a substance derived from the vegetable or animal sources and often a mixture of substances Classification

General chemicals
- Inorganic, as acids, alkalis and salts
- Organic, as alkaloids, dyes, sugars
- Metals and alloys

Coal tar products
- Intermediates
- Dyes and stains
- Medicinals and bacteriological stains
- Photographical chemicals, developers, dyes

Reagents
- Tested, analysed or standardized chemicals
- Volumetric solutions
- Indicators

Chemicals may be marketed as cones (as silver nitrate), cubes (as litmus), crystals, flakes (as naphthalene), fused, granulated, lumps, pearls (as iron salts), powdered, scales, or sticks

The *grade* or the purity of chemicals on the market are

C P	chemically pure, the highest grade
U S P or B P	tested to conform with the requirements of the U S or British Pharmacopoeia, respectively
A R	analytical reagent
pure	of sufficient purity for general work
tech	a purity sufficient for technical work
crude	an impure grade

kinetic- Refrigerants Those c used for refrigeration

chemiluminescence The production of visible light during chemical reactions without an apparent increase in temperature See *luminescence*

chemistry The fundamental science of the structure of matter and the composition of substances, their transformation, analysis, synthesis, and manufacture **agricultural-** C applied to agriculture, soils, fertilizers, manures, and the growing of plants **analytical-** C which deals with the detection (qualitative) and determination (quantitative) of substances **animal-** C dealing with the composition of animal tissues and fluids, cf *bio-* **applied-** C applied to some useful end, either directly (through industry) or indirectly for the welfare of man **astro-** The investigation of the composition of celestial objects, as stars, and nebulae, it is a branch of astrophysics **bio-** The chemistry of life, or c that deals with the composition of animal and vegetable matter, the changes occurring in the living organism, the transformation of food into living material, and the elimination of waste-products **biological-** Bio- **commercial-** (1) The compounding and mixing of substances for some directly utilitarian purpose, usually for some patented or secret recipe **electro-** A branch of physical c dealing with the relation between electrical and chemical energy and their transformation cf *electrolysis, galvanic cells* **empirical-** The knowledge of chemical phenomena obtained by uncorrelated and unsystematized experimentation, chemistry based upon experience which is fragmentary and not embodied in a philosophy or system of science **engineering-** C applied to engineering, the composition of building materials testing and improvement **experimental-** The performance of experiments to illustrate or discover chemical facts **fermentation-** A branch of biochemistry dealing with the catalytic changes produced by enzymes and ferments **food-** C dealing with the composition and examination of foods, detection of adulterants, and the control of foods for human consumption **forensic-** The application of chemical knowledge for legal purposes, for the detection of crime **galvano-** Electro- **geo-** The investigation of the chemical resources of the earth's surface and the changes occurring in the atmosphere hydrosphere, and lithosphere **geological-** Geo- **histo-** The composition of or chemical changes occurring in the tissues of plants and animals **histological-** Histo- **historical-** The study of the development and evolution of chemical thought through the ages **industrial-** C applied to the industries **inorganic-** The c of polar compounds, usually of compounds which do not contain carbon **judicial-** Forensic- **legal-** Forensic- **manufacturing-** C applied to the large-scale preparation of substances **medical-** C applied to medicine, for the diagnosis and combating of disease **mechano-** A branch of physical c dealing with the mechanical properties of substances, *e g*, surface tension, density, strength, compressibility **meta-**

A branch of chemistry which deals with the subatomic properties of matter, (*e g*, radioactive substances) or with its characteristically atomic properties, as, adsorption, association, excitation **micro-** See *micro* and *chemical microscopy* **microscopical-** Micro- **mineral-** Mineralogical- or inorganic- **mineralogical-** C that deals with the composition and formation of minerals **organic-** The c of carbon compounds, generally those which are non-polar **pathological-** The c of the composition of abnormal tissues and body fluids, and the changes caused by disease **pharmaceutical-** Chemistry applied to the preparation, testing, and composition of drugs **philosophical-** The appreciation of chemical knowledge and its position in a system of science **photo-** The study of the relations of radiant and chemical energy and their transformation, the effect of light on the composition of substances **photographic-** C applied to photography and photographic processes **physical-** A branch of theoretical c which deals with the relation of energy and chemical force, and their transformation **physiological-** The c of the composition of and chemical changes in the healthy animal or vegetable organism **phyto-** The c of plants and plant functions **practical-** Experimental c as performed in the laboratory **pure-** A branch of theoretical c that deals with chemical forces alone **radio-** A branch of theoretical c which studies the composition and structure of the atom as revealed by the radioactive elements **sanitary-** The application of c to sanitation, water supply, disposal of domestic wastes, etc **stereo-** A branch of theoretical c which deals with the structure of molecules **stoichiometric-** A branch of theoretical c which deals with chemical force as expressed by atomic weight and valency, the proportions in which substances react and the distribution in space of the atoms of a molecule **structural-** A branch of stereochemistry dealing with the internal molecular arrangement of carbon compounds **synthetic-** Building up of compounds from simpler substances, especially of organic compounds (dyes, synthetic drugs, etc) **technical-** C applied to technology and to processes of manufacturing **theoretical-** The deduction of laws which govern the experimentally-established facts of chemistry and their mathematical relations **therapeutical-** A branch of medical chemistry dealing with the effect of drugs on the living organism **thermo-** The branch of physical c dealing with the relation of heat and heat radiations during chemical changes **topo-** See under *topochemistry* **toxicological-** A branch of forensic c dealing with the composition of poisons and their detection **vegetable-** The branch of biochemistry dealing with the composition of plants and the changes occurring during the performance of their normal functions **zoo-** The c of animals and animal functions, exclusive of man

chemoceptor The anchoring group in the protoplasm of a cell which unites the haptaphore of drugs and renders them capable of action

chemo-immunology The study of the chemical changes occurring during the immunization of an organism

chemokinesis Increasing the activity of an organism by the presence of a chemical substance

chemology A proposed alternative term for chemistry

chemolysis The dissolution of organic matter which occurs during decay, and is due to chemical reactions and not bacteria

chemoreceptor Chemoceptor

chemoresistance The specific resistance of a cell due to the presence of a chemical substance

chemosmosis Chemical reactions taking place through an intervening semi-permeable membrane, as in colloidal growth

chemosynthesis A chemical reaction in which the energy is not derived from oxygen (as in

- I *Theoretical Chemistry*
  - Ia PURE
    - 1 STOICHIOMETRY
    - 2 RADIOCHEMISTRY
    - 3 STEREOCHEMISTRY
  - Ib PHYSICAL
    - 4 MECHANOCHEMISTRY
    - 5 THERMOCHEMISTRY
    - 6 ELECTROCHEMISTRY
    - 7 PHOTOCHEMISTRY
- II *Practical Chemistry*
  - IIa OBJECTIVE
    - 8 INORGANIC CHEMISTRY
    - 9 ORGANIC CHEMISTRY
    - 10 ANALYTICAL CHEMISTRY
  - IIb SUBJECTIVE
    - 11 ASTROCHEMISTRY
    - 12 GEOCHEMISTRY
    - 13 BIOCHEMISTRY
- III *Applied Chemistry*
  - IIIa DIRECT
    - 14 SANITARY CHEMISTRY
    - 15 PHARMACEUTICAL CHEMISTRY
    - 16 MEDICAL CHEMISTRY
    - 17 FOOD CHEMISTRY
    - 18 FERMENTATION CHEMISTRY
    - 19 AGRICULTURAL CHEMISTRY
  - IIIb INDIRECT
    - 20 TECHNICAL CHEMISTRY
    - 21 INDUSTRIAL CHEMISTRY
    - 22 ENGINEERING CHEMISTRY
    - 23 COMMERCIAL CHEMISTRY
    - 24 MANUFACTURING CHEMISTRY

The Branches of Chemistry

photosynthesis, q v), but from oxidation by bacteria, as,

$$H_2S \rightarrow H_2SO_4$$
$$Fe^{++} \rightarrow Fe^{+++}$$
$$NH_3 \rightarrow N_2$$

chemotaxis Chemotropism The attraction or repulsion of cells by chemicals

chemotherapy The study of the action of molecules of definite structure on protoplasm on the assumption that certain radicals have a selective affinity with parts of the cells Cf *Ehrlich's side chain theory, chemoceptor*

chemotropism Chemotaxis **negative-** The repulsion of microorganisms by chemicals **positive-** The attraction of microorganisms by chemicals

chemurgic Chemistry applied to farming **C Council** An organization of Dearborn, Mich U S A , whose purpose is to advance the industrial use of American farm products through applied science At its first conference it signed 'under the shadow of a replica of Independence Hall," on May, 7th, 1935, a *Declaration of Dependence Upon the Soil and of the Right of Self-Maintenance*

chenocholic acid $C_{27}H_{44}O_4$ = 432 4 An acid derived from chenotaurolic acid by hydrolysis

chenopodin A bitter principle from *Chenopodium album* Cf *betaine*

chenopodium (1) The goosefoot family (2) American wormseed, Mexican tea The fruit of *C anthelminticum*, used as a mild cardiac stimulant **c oil** American wormseed oil The essential oil from the seeds of *C ambrosioides*, used as an anthelmintic **c seeds** The fruits of *C ambrosioides* or *C anthelminticum* American wormseed, an anthelmintic

chenotaurocholic acid $C_{29}H_{29}O_6NS$ = 519 3 An acid in goose's bile Cf *chenocholic acid*

chernawinite Canadian amber A resinous mineral similar to amber, found in Canada

cherry A tree of the subgenenus *Cerasus* of *Prunus* (Rosaceae) Cf *cerasinose* **wild-** See *wild*

cherrylaurel The leaves of *Prunus laurocerasus* a Rosaceae, used as sedative **c oil** The essential oil of c , d 1 054–1 066, soluble in 2 pts 70 % alcohol, contains, HCN and benzaldehyde **c water** The distillate of the crushed c leaves, used to kill beetles

Cheshunt mixture A substitute for Bordeaux mixture in which the lime is replaced by ammonium carbonate

chessylite Azurite

chestnut Castanea

chevkinite A complex mixture of hydrated oxides of K, Na Fe, Ca, Mn, La and Ce

Chevreul, Michel Eugéne 1786–1889 A French chemist noted for work on fats, soap and textile dyeing

Chew ductility machine An electrical device for determining the ductility of materials

chi The Greek letter χ It indicates the 22*nd* carbon atom

chibou The resin of *Bursera gummifera*, a tree of Florida and tropical America, used in plasters and ointments

chicle Gum chicle, balata, tuno gum The dried milky juice of the bully-tree (*Mimusops balata*), a Sapotaceae of Northern South America It consists of oxidized hydrocarbons and resembles caoutchouc and guttapercha Occurs as soft, grayish-white masses, tasteless, m 49, used in the manufacture of chewing gum

chicory The ground root of *Cichorium intybus*, a composite plant of Europe and Asia, naturalized in the United States Used as a coffee substitute or adulterant

chile Capsicum **c niter** Sodium nitrate **c saltpeter** Caliche The sodium nitrate found in large deposits in Chile

chilenite A silver bismuthide, Ag_6Bi

chilli, chilly Capsicum

Chimaphila Pipsissewa The dried leaves of *C umbellata*, an Ericaceae Used as a tonic, antiperiodic, diuretic, and astringent

chimaphilin $C_{24}H_{21}O_4$ = 373 1 Golden-yellow needles, odorless, tasteless, m 114, insoluble in water, soluble in alcohol or ether, obtained from the leaves of *Chimaphila umbellata*, used as a diuretic

chimaphiloid The combined principles from the leaves of *Chimaphila umbellata* Used as stimulant, alterative tonic, and diuretic

chimosis See *gastric digestion*

chimyl alcohol $C_{19}H_{40}O_3$ = 316 3 The glyceryl ether $C_{16}H_{33}OC_3H_5(OH)_2$ Cf *butyl* and *selachyl alcohols*

china (1) Cinchona bark (2) Porcelain **c clay** The product obtained by leaching weathered deposits of granitic rocks, so that the quartz and mica portions are removed Cf *kaolin* **c grass** Ramie **c jute** The fibre from *Abutilon avicennae*, a Malvaceae cultivated in China **c root** (1) Smilax (2) Galangal **c tallow tree** *Sapium sebiferum*, an Euphorbiaceae, whose seeds are rich in oil **c. wood oil** Tung oil

chinaldine Quinaldine

chinaphenine Et O C_6H_4NH CO $OC_{20}H_{23}ON_2$ = 485 29 Quinine carbophenetidine The quinine carbonic acid ester of phenetidine A white, tasteless powder, slightly soluble in water, soluble in alcohol, ether, benzene or chloroform, used as an antipyretic and antineuralgic

chinaphthol Quinanaphthol

chinaroot The dried rhizome of *Smilax china*, a plant of Southern China resembling sarsaparilla

chinaseptol Diaphtol

chinazoline Quinazoline

chinchona Cinchona bark

chindoline Quindoline

Chinese c blue Prussian blue **c cinnamon** Cassia bark **c oil** Tung oil **c wax** A wax formed on *Fraxinus chinensis* from the secretions of *Coccus ceriferus*, it consists chiefly of ceryl cerotate

chinic acid Quinic acid

chinidine Cinchonidine

chinindoline Quinindoline

chinine Quinine

chiniofon $C_9H_6ONIS + Na_2CO_3$ Yatren, *7-iodo-8-ozyquinoline-5-sulfonic* acid with sodium carbonate Yellow crystalline powder, which effervesces in water and forms sodium iodoxy quinoline sulfonate, used as an antidysenteric and amebicide

chinioidina Quinoidine

chinoform Quinoform

chinoidine Quinoidine

chinol Hydroquinol

chinoline Quinoline

chinopyrine Quinopyrine

chinoral Quinoral A compound of quinine and chloral, used as a hypnotic and antiseptic

chinosol $C_9H_6ON\,SO_3K\,H_2O$ Quinosol Oxyquinolin potassium sulfonate A white powder, used as an antiseptic, styptic, and antipyretic

chinothein A mixture of quinine, caffeine, and antipyrine

chinotoxine Quinotoxine A synthetic drug resembling curare in its action

chinotropine Quinotropine

chinovate (1) A salt of quinovatic acid (2) A compound of chinovase

chinovin Quinovin

chinovose A carbohydrate from cinchona bark

chinwood Taxus

chiococcic acid An acid compound from cahincic acid

chiolite Arksutite The mineral, $2NaF\,AlF_3$, d 2 84 It resembles cryolite

chiococcine An alkaloid from the roots of *Chiococca racemosa* or cahinca, which resembles emetine in its action

chionanthin $C_{22}H_{28}O_{10}$ = 452 22 A resin from the *Chionanthus virginica*, the poison ash or fringe-tree of North America, used as a tonic and sedative Cf *chionanthus*

chionanthoid The combined principles from the bark of *Chionanthus virginica*, used as a hepatic stimulant and cholagogue to increase appetite

chionanthus The bark of the fringe-tree, *C virginica*, (poison ash, Virginia snow flower, mist tree), an Oleaceae of Southern United States, used as fluid extract, as an aperient, tonic and diuretic

chipmunk crushers A grinding machine for ores and rocks

chiquito A fat obtained from *Combretum butyrosum*, a Combretaceae of tropical Africa

chirata Chiretta The dried herb of *Swertia* (*Ophelia*) *chirata*, a Gentianaceae of India, used as bitter tonic Cf *chiratin, ophelic acid*

chiratin $C_{26}H_{48}O_{15}$ = 600 5 A bitter crystalline glucoside from the *Ophelia chirata*, a Gentianaceae of Europe, India and South Africa It is a yellow, hygroscopic powder which is hydrolyzed to ophelic acid and chiratogenin

chiratogenin $C_{13}H_{24}O_3$ = 228 0 A split-product of chiratin

chironol $C_{28}H_{48}O$ = 400 37 An alcohol from *Opopanax chironium* an Umbelliferae

chitenidine $C_{19}H_{22}ON_2$ = 294 2 An oxidation product of quinine

chitenine $C_{19}H_{22}O_4N_2$ = 342 19 An oxidation product of quinine used in malaria

chitin $C_{15}H_{26}O_{10}N_2$ = 394 3 The horny substance which forms the framework of invertebrates (crabs, lobsters, beetles), and is the animal analog of the cellulose of plants Decomp to glucosamine and acetic acid when boiled with concentrated HCl

chitosamin Glucosamine

chitosan A split-product of chitin Chitin and chitosan are related to mucin and chondrosin, and thereby support the theory that the arthropods are the ancestors of the vertebrates

chitose $C_6H_{12}O_6$ = 184 1 A sugar formed from chitonic acid

chittim bark Cascara sagrada

chlamydobacteria Bacteria of various shapes that possess a rigid sheath or capsula, as, streptothrix, cladothrix, crenothrix, phragmidothrix, and thiothrix

chlamydozoa A minute animal organism, which is surrounded by a rigid sheath or capsula

chloanthite A native nickel arsenide

chlor- See *chloro-*

chloracetamic acid C_2HONCl_4 = 196 82 Tetrachloracetamide, $CCl_3\,CO\,NHCl$

chloracetamide See *acetamide*

chloracetate A salt of chloracetic acid which contains the monvalent CH_2ClCOO— radical

chloracetic acid $C_2H_3O_2Cl$ = 94 49 Carboxymethyl chloride, chloroacetic acid, $CH_2ClCOOH$ Colorless, rhombic crystals, $d_{54°}$ 1 398, m 51, b 189, insoluble in water, soluble in alcohol or ether **tri-** See *trichlor-*

chloracetone C_3H_5OCl = 92 51 Acetyl-methyl chloride chloroacetone, monochloracetone, $CH_2Cl\,CO\,CH_3$ A colorless liquid, $d_{16°}$ 1 162, b 119, insoluble in water, miscible with alcohol or ether It is liable to spontaneous explosion and should be carefully stored

chloracetonic acid $C_4H_7O_3Cl$ = 138 5 Chloroacetonic acid, $CH_2Cl\,C(OH)(Me)COOH$

chloracetophenone C_8H_7OCl = 154 5 C A P Phenacyl chloride, chloroacetophenone, $Ph\text{-}COCH_2Cl$ Rhombic crystals, d 1 32, m 59, b 245, used as a tear gas

chloracetyl Chloroacetyl The monovalent radical, $CH_2Cl\,CO$—, derived from chloracetic acid **c chloride** $CH_2Cl\,COCl$ = 112 93 A colorless liquid, d_0° 1 495, b 105, decomp by water or alcohol

chloracid An organic acid containing chlorine

chloracrylate A salt of chloracrylic acid containing the monovalent $C_2H_2Cl\,COO$— radical

chloracrylic acid $C_3H_3O_2Cl$ = 106 5 The compound $CHCl{=}CH{-}COOH$

chloral C_2HOCl_3 = 147 37 Trichloracetic aldehyde, trichloroacetaldehyde, trichloroethanal*, $CCl_3\,CHO$ A colorless, oily liquid, $d_{20°}$ 1 512, m −57 5, b 98, soluble in water, alcohol or ether, used as a hypnotic Cf *hydronal* **amylene-** Dormiol **anhydrogluco-** Chloralose **butyl-** See *butyl* **poly-** Hydronal **urethan-** Uralin **c alcoholate** $C_4H_7O_2Cl_3$ = 193 46 Trichlorethylate, $CCl_3\,CHOH\,OEt$ Colorless crystals, $d_{40°}$ 1 43, m 46, b 115, slightly soluble in water, soluble in alcohol or ether, used as a hypnotic **c amide** $CCl_3CHOH\,NH_2$ = 164 4 C ammonium, chloralformamide, chloramide White crystals, m 71, soluble in alcohol or ether It is a hypnotic and analgesic **c ammonia** C amide **c antipyrine** Hypnal. **c benzamide** $CCl_3CHOH(C_6H_5CONH)$ = 268 4 Colorless crystals, used as a hypnotic **c caffeine** A molecular mixture of caffeine and chloral soluble in water **c cyanhydrin** $CCl_3\text{-}CHOH\,CN$ = 174 4 C cyanhydride, c hydrocyanide, trichloracetonitrile Colorless crystals, m 60, b 218, soluble in water, alcohol or ether, used as a substitute for bitter almond water **c hydrate** $CCl_3CH(OH)_2$ = 165 39 Hydrated c, crystalline c Colorless deliquescent needles or plates, d 1 901, m 47 4, b 97 (decomp), soluble in water, alcohol or ether It is a hypnotic, antispasmodic, antiseptic, used extensively in medicine and as reagent for ergosterol **c hydrocyanide** C cyanhydrin **c hydrosulfide** $(CCl_3CHOH)_2S$ = 328 46 Colorless crystals, soluble in water **c sulfhydrate** $CCl_3CHOHSH$ = 181 77 Colorless prismatic crystals **c thiobenzamide** $CCl_3\,CHOH\,C_6H_5CSNH$ = 284 82 Colorless crystals, slightly soluble in water **c uric acid** Chloraluric acid

chloralbine $C_6H_6Cl_2$ = 148 9 Colorless crystals derived from trichlorphenol

chloralide A compound of chloral

chloralimide $CCl_3CH\ NH$ = 146 4 Colorless crystals, m 155, soluble in alcohol or ether, used as a hypnotic and analgesic

chlorallyl The monovalent C_3H_4Cl— radical derived from allyl

chlorallylene. Allyl chloride

chloraloin $C_{34}H_{30}O_{14}Cl_6$ = 874 92 A yellow, amorphous precipitate obtained by the action of chlorine on aloes

chloralose $C_8H_{11}O_6Cl_3$ = 309 4 Anhydroglucochloral Colorless crystals, m 185, slightly soluble in water, soluble in alcohol It is a hypnotic **para-** An isomeric by-product obtained by the action of chloral on glucose, it is without therapeutic effect It forms colorless crystals, m 227

chloralurethane Uralin

chloraluric acid $C_{14}H_{22}O_{11}N_{12}Cl_2$ = 651 5 Colorless crystals, obtained by the action of $HClO_2$ on uric acid

chloramide Chloral amide

chloramidobenzene Chloraniline

chloramine NH_2Cl = 51 53 Monochloramine A colorless, unstable, pungent, liquid An intermediate in the preparation of hydrazine from Cl_2 and NH_3 **chloramine-T** Chlorazene

chlorammine A process of chlorinating water by injecting chlorine and ammonia

chloranil $C_6Cl_4O_2$ = 245 84 Tetrachlorquinone, tetrachloro-*p*-benzoquinone Yellow scales, m 290 (sublime), slightly soluble in alcohol, soluble in ether, used as an oxidizing agent in the dye industry

chloranilam $C_6H_3O_2NCl_2$ = 207 9 Chloranilamidic acid Colorless crystals, formed from chloranil by the action of HCl

chloranilamide $C_6H_2O_2N_2Cl_2$ = 220 9 The amide of chloranilamidic acid

chloranilamidic acid Chloranilam

chloranilanilide $C_6Cl_2(NHPh)_2O_2$ = 359 06 Colorless crystals formed by heating chloranil, alcohol, and aniline

chloranilate A salt of chloranilic acid containing the divalent $C_6Cl_2O_4$— radical

chloranilic acid $C_6Cl_2O_2(OH)_2$ = 209 0 *2 5*-Dichloro-*3 6*-dihydroxy quinone A dibasic acid derived from chloranil Red leaflets, m 283, insoluble in water

chloraniline See *aniline*

chloranion The chlorate ion

chloranol $C_6H_2O_2Cl_4$ = 247 85 Tetrachloroquinol Pale yellow crystals, used as a reagent and in the dye industry

chlorantimoniate A double salt of a chloride with antimony trichloride

chlorargentate A double salt of a metal chloride with silver chloride

chlorargyrite Argentum cornu

chlorarsine Cacodyl chloride

chlorastrolite A variety of jade

chlorate A salt of chloric acid which contains the monovalent ClO_3— radical **c. ion.** The monovalent ion ClO_3^-, derived from chloric acid

chlorated A substance containing chlorine, especially when the chlorine is readily available as in chloride of lime

chloraurate A double salt of auric chloride with some other chloride, or a salt containing the monovalent $AuCl_4$— radical

chlorauric acid $HAuCl_4$ = 340 0 Yellow crystals, formed on evaporation of a solution of gold in aqua regia

chlorauride Auric chloride

chloraurite A double chloride of the type AuCl - MCl or a compound containing the —$AuCl_2$ radical

chlorazene $MeC_6H_4SO_2Na\ NCl\ 3H_2O$ = 281 5, Sodium p-toluene-sulfo-chloramine, mianine activin, tochlorine, chloroamine, tolamine, chloramine-T Dakin's antiseptic, mannolite A by-product in the manufacture of saccharin. Colorless crystals, soluble in water, used as an antiseptic, as a 0 5–4 % aqueous solution for the irrigation of wounds, and in the volumetric analysis of nitrites

chlorazol (1) $C_4H_3O_4NCl_2$ = 235 4 An acrid, pungent, oily liquid obtained from proteins (muscles, albumin, glutin) by the action of nitric and hydrochloric acid and distilling (2) A trade name for direct dyestuffs

chlorbenz- Chlorobenz-

chlorbenzamide Benzamide

chlorbenzene See *chloro-benzene*

chlorethanal alcoholate Somnol

chlorethane See *ethane*

chlorethanol C_2H_5OCl = 80 50 Chlorcarbinol, 2-chloroethyl alcohol $ClCH_2CH_2OH$ A colorless liquid, d 1 213, m −69, b 128 8

chlorethene Ethylene

chlorethyl Ethyl chloride

chlorethylene See *ethylene*

chlorethyl ether $C_4H_8Cl_2O$ = 142 98 Dichloroethyl ether, chlorex, $(ClCH_2CH_2)_2O$ A colorless liquid, d 1 213, b 178, used as solvent

chlorethylidene Ethylidene

chloretone $C_4H_7OCl_3$ = 177 4 Acetone chloroform, 2-trichloromethyl-2-propanol, *1 1 1*-trichloro-*2*-methyl propanol*, chlorobutanol, anesin, aneson, CCl_3CMe_2OH Colorless, odorous deliquescent crystals, m 80, sparingly soluble in water, soluble in alcohol, ether or oils, used as an anesthetic, antiseptic, hypnotic, and for seasickness

chlorex A trade name for dichloroethyl ether **c process** A method of refining lubricating oils with c

chlorhydrate Hydrochloride

chlorhydrin A compound containing both, the Cl and OH radicals, as, ethylene c , propylene c Cf *halohydrin, dichlorhydrin*

chloric acid $HClO_3$ An acid of pentavalent chlorine, which can exist only in solutions and as compounds Its salts are the chlorates **per-** $HClO_4$ An acid of heptavalent chlorine, which exists only in dilute solution and in the form of compounds such as the perchlorates

chloride A salt containing the monovalent Cl—, usually a binary compound of chlorine in which chlorine is the negative constituent **c of lime** Bleaching powder **c of soda** Sodium chloride **c ion** Chlorion A negatively charged atom Cl^-, formed by dissolving a soluble chloride in water

chloridion Chloride ion

chloridization (1) Chlorination (2) The treatment of ores with chlorine or hydrochloric acid, to produce the chloride of the principal metal present

chloridometer Chlorometer A device for estimating chlorides in urine

chlorimetry The quantitative determination of the available or free chlorine in compounds, especially in bleaching powder

chlorin. Crude dinitro resorcinol

chlorinate. To introduce chlorine into a compound, or to combine it with a substance

chlorinated Treated with chlorine **c lime** Bleaching powder containing not less than 30 % available chlorine **c solvents** A series of non-inflammable, stable, non-corrosive and non-explosive liquids formed by the action of chlorine on acetylene, *e g*

dieline	$C_2H_2Cl_2$, b 52
trieline	C_2HCl_3, b 85
eteline	C_2Cl_4, b 119
tetraline	$C_2H_2Cl_4$, b 144
pentaline	C_2HCl_5, b 159
perchloroethane	C_2Cl_6, b 185

chlorination The process of saturating with or introducing chlorine into a compound, especially the substitution of hydrogen atoms of an organic compound by chlorine atoms **exhaustive-** The successive substitution of all H atoms by Cl

chlorindin $C_{16}H_8O_2N_2Cl_2$ = 330 9 A chlorine substitution product of indin

chlorindoptene $C_3H_4OCl_4$ = 257 8 Colorless crystals obtained by the action of chlorine on indigo-blue

chlorine Cl = 35 457 A halogen element, atomic number 17 A greenish-yellow, poisonous gas with suffocating odor, m −102 0, b −33 60, d (liquid Cl) 1 4, d (gaseous Cl_2) 71 63 (H_2 = 2), or 2 49 (air = 1), soluble in water After fluorine it is the most electronegative element It is the most abundant halogen, and occurs as chlorides (sea-water, salt-deposits) in many minerals, and in all vegetable and animal tissues It is obtained as a by-product in soda manufacture, or by electrolysis of chlorides Discovered in 1774 by Scheele It consists of two isotopes Cl^{35} and Cl^{37} and is mono-, tri-, or penta-valent, hence, it gives the following series of compounds

− 1 chlorides	Cl^- *e g* NaCl
+ 1 hypochlorites	ClO^- *e g* NaOCl
+ 3 chlorites	ClO_2^- *e g* $NaClO_2$
+ 5 chlorates	ClO_3^- *e g* $NaClO_3$
+ 7 perchlorates	ClO_4^- *e g* $NaClO_4$

Used as a bleaching agent for textiles, straw and sponges, as a poison gas in chemical warfare, in the extraction of gold, as a disinfectant, germicide and insecticide, as an oxidizing and reducing agent in chemical synthesis **available-** (1) The chlorine that can be liberated from a substance (*e g*, bleaching powder) by acids (2) The chlorine equivalent of the active oxygen of an oxidizing agent (*e g*, a hypochlorite)

c cyanide Cyanogen chloride **c dioxide** ClO_2 = 67 5 C peroxide A yellowish, strong irritating gas, $d_{(air=1)}$ 2 315, m −76, b 9 9, or reddish liquid, d 1 5 It is soluble in water, decomp in alcohol, and is a strong oxidizing agent forming hypochlorites or peroxides, it explodes in contact with NH_3, CH_4, PH_3, or H_2S **c heptoxide** Cl_2O_7 = 182 9 The anhydride of perchloric acid A colorless, oily liquid, b 82, which readily decomposes and explodes **c hydrate** $Cl\ 8H_2O$ = 179 6 or $Cl\ 5H_2O$ = 86 91 Octahedric, yellow crystals, d 1 23, stable below 9, m −50 **c hydride.** Hydrochloric acid **c monoxide** Cl_2O = 86 9 Anhydride of hypochlorous acid A yellowish-red liquid or yellowish gas, $d_{(air)}$ 2 99, m −20, b 5, soluble in water or concentrated sulfuric acid but decomp by alkalis **c oxides** Cl_2O = c monoxide, anhydride of hypochlorous acid ClO_2 = c dioxide Cl_2O_7 = c heptoxide, anhydride of perchloric acid ClO_4 = c tetroxide The existence of Cl_2O_3 and Cl_2O_6 is doubtful **c water** A pale greenish-yellow liquid of strong chlorine odor, obtained by passing a stream of chlorine through water It contains 0 4 gram Cl per 100 cc, and if kept for any length of time, it decomposes to HCl and HOCl Used as a reagent in determining I, Br, quinine, uric acid, or xanthine, also as an oxidizing and bleaching agent and antiseptic

chlorinity The number of grams of halides (calculated as Cl) occurring in a kg of sea water It is related to salinity, S, thus S = 0 03 + 1 805 Cl

chloriodic acid Iodine monochloride

chloriodide A double salt containing an iodide and chloride

chloriodoform $CHCl_2I$ = 210 8 Dichloriodoform, formyldichloroiodide, dichloroiodomethane A yellow aromatic liquid

chlorion Chloride ion

chlorisatic acid $C_8H_6O_3NCl$ = 199 5 A chlorine substitution product of isatic acid

chlorisatide $C_{16}H_{10}O_4N_2Cl_2$ = 365 1 A chlorine substitution product derived from isatin, a white insoluble powder

chlorisatimide $C_{24}H_{15}O_4N_5Cl_2$ = 508 2 A chlorine substitution product of isatimide

chlorite (1) A salt containing the monovalent ClO_2^- radical derived from chlorous acid (2) A group of rock-forming minerals, *e g*, clinochlore, penninite, prochlorite

chlorition The negatively charged ClO_2^- formed by ionization of chlorous acid and chlorites

chloritoid Phyllite The mineral Al_2O_3,FeO, SiO_2,H_2O

chlorknallgas An explosive mixture of chlorine and hydrogen

chloro- Describing an organic compound which contains chlorine atoms substituted for hydrogen atoms The prefixes chlor- and chloro- are often interchangeable, but the former indicates a closer relationship of chlorine to the compound which it prefixes *E g*, chloracetate is a salt containing the radical CH_2ClCOO—R, and derived from chloracetic acid, while chloroacetate is a salt of the type CH_2 COO—R—Cl, that is, derived from acetic acid and chlorine

chloroacetophenone Chloracetophenone

chloroben Dichlorobenzene

chlorobenzaldehyde C_7H_5ClO = 140 5 Chlorobenzene carbonal*, Cl C_6H_4,CHO **o-** or *2-* m 11, b 208 **m-** or *3-* m 17, b 213 **p-** or *4-* m 47, b 214

chlorobenzoate A salt of chlorbenzoic acid containing the monovalent C_6H_4Cl COO— radical

chlorobenzoic acid See *benzoic acid, chloro-*

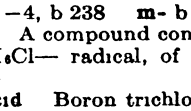
chlorobenzoyl C_7H_5OCl = 140 5 A colorless liquid derived from benzaldehyde and chlorine **c chloride** $C_7H_4OCl_2$ = 179 95 ClCO C_6H_4-Cl **o-** m −4, b 238 **m-** b 117 **p-** b 119

chlorobenzyl A compound containing the monovalent C_7H_6Cl— radical, of which 10 isomers are possible

chloroboric acid Boron trichloride

chlorobromacetate A salt of chlorbromacetic acid of the type CHClBr COOM

chlorobromacetic acid $C_2H_3O_2ClBr$ = 173 5



chlorobromglycide CH_2 CBr CH_2Cl = 155 5 A colorless liquid

chlorobromopropane Trimethylene chlorobromide
chlorobutadiene Chloroprene
chlorobutanol Chloretone
chlorobutyric acid Butyric acid
chlorobutyryl The radical $C_3H_2Cl\,CO$—
chlorocalcite Hydrophilite
chlorocamphene $C_{10}H_{12}Cl_4 = 273\,8$ A colorless liquid obtained by the action of chlorine upon terebenthene
chlorocamphor A number of chlorine substitution products of camphor, *e g*, monochlorated, dichlorated, etc
chlorocarbinol $CH_2Cl\,CH_2OH = 80\,5$ Chlorethanol
chlorocarbonate Chloroformate A compound containing the monovalent $ClCO\,O$— radical *e g*, methyl chlorocarbonate, $ClCO\,OMe$
chlorocarbonic acid Chloroformic acid
chlorocarvene $C_{10}H_{15}Cl = 170\,5$ A colorless liquid obtained by the action of chlorine upon carvene
chlorochromic acid The compound $HClrO_3Cl$, see *chromyl chloride*
chlorocinnamoyl The radical $C_6H_4Cl\,CH\,CH\,CO$—
chlorocinnose $C_9H_4OCl_4 = 269\,8$ Colorless crystals, obtained by the distillation of a mixture of cinnamic acid and P_2O_5
chlorocitraconyl $C_5H_4O_2Cl_2 = 166\,9$ An addition product of citraconyl and chlorine
chlorocitric acid See *citric acid*
chlorocodeine A chlorine substitution product of codeine
chlorocosane A liquid chlorinated paraffin which contains chlorine in stable combination
chlorocresol green $C_{21}H_{14}Cl_4O_5S = 521\,9$ *2 3 - 6 7*-Tetrachloro-*m*-cresol sulfon phthalein A gray powder used as pH indicator between 4 0 (yellow) and 6 0 (blue)
chlorocruorin A green pigment related to hemoglobin, found in certain molluscs
chlorocyanamide $CN\,NHCl = 76\,48$ A chlorine substitution product of cyanamide
chlorocyanide A double salt of a chloride and cyanide, MCl MCN
chlorocyanilide $C_{15}H_{12}N_3Cl_5 = 411\,4$ Colorless crystals
chlorocyanogen Cyanogen chloride
chlorodifluoromethane $CHClF_2 = 86\,5$ A colorless gas, m −146, b −39 8, used as an anesthetic and refrigerant Cf *freon*
chlorodracylic acid p- Chlorobenzoic acid
chlorofluoride A double salt of a chloride and fluoride, MCl MF
chloroform $CHCl_3 = 119\,37$ Trichloromethane* A colorless, volatile liquid- $d_{15°}\,1\,499$, m −63 2, b 61 2, almost insoluble in water, miscible with alcohol or ether Used as a solvent for oils, fats, iodine, bromine, rubber, and medicinally as an anesthetic, anodyne, and antispasmodic **aceton-** Chloretone **colloidal-** Desalgin **crystal-** Chloroformate **germanium-** See *germanium* **methyl-** $MeCCl_3 = 133\,4$ A colorless liquid, used as an anesthetic **nitro-** Chloropicrin **phenyl-** Benzotrichloride **c -d** $CDCl_3 = 120\,37$ Deuterochloroform, CH^bCl_3 A white solid, m 64 2–64 7, formed from CCl_3CHO and D_2O **c of crystallization** Chloroformate
chloroformate (1) A crystal deposited from a solution containing chloroform as a constituent of its crystal structure, cf *water of crystallization* (2) Chlorocarbonate An ester of chloroformic acid, as, palite
chloroformic acid $CHO_2Cl = 80\,5$ Chlorocarbonic acid The hypothetical acid, Cl COOH, esters of which are known
chlorofumaryl Fumaryl chloride
chlorogenic acid $C_{16}H_{18}O_9\,\frac{1}{2}H_2O$ An acid occuring in coffee and many other plants It is a depside of caffeic and quinic acid, m 208, and a constituent of caffetannic acid
chlorogenine $C_{21}H_{30}O_4N_2\,3\frac{1}{2}H_2O = 434\,73$ Alstonine An alkaloid from the bark of *Alstonia constricta* A brown powder, m 195, insoluble in water, soluble in alcohol or ether, used as an antipyretic and antiperiodic resembling quinine in its action
chlorolactic acid See *lactic acid*
chloromaleic acid $C_4H_3O_4Cl = 150\,5$ A substitution product of maleic acid, which forms colorless white crystals
chloromalonic acid See *malonic acid*
chloromenthene $C_{10}H_{17}Cl = 172\,6$ A substitution product of menthol, a yellow, oily liquid
chloromercuriphenol $C_6H_4(OH)ClHg = 329\,11$ Colorless crystals, m 152 5, soluble in sodium hydroxide
chloromesityl $C_5H_5Cl = 76\,5$ Mesityl chloride A substitution product obtained by heating acetone with P_2O_5
chloromesitylene $C_9H_{11}Cl = 154\,5$ A chlorinated mesitylene, $C_6H_2Me_3Cl$
chloromesitylide $C_3H_3Cl = 74\,5$ A crystalline substance obtained by the action of chlorine upon mesitylene
chlorometer Chloridometer
chloromethane Methyl chloride
chloromethyl The monovalent CH_2Cl— radical derived from methyl chloride **di-** The radical —$CHCl_2$ **tri-** The radical —CCl_3 **c chloroformate** Palite **c silicane** $CH_5ClSi = 80\,56$ Methylchlorosilane, $MeSiH_2Cl$ A colorless gas, $d_{-80°}\,0\,935$, m −134 5, b 7
chloromychmylic acid $C_4H_5O_3Cl_2 = 175\,0$ An acid from urine
chloronaphthalene See *naphthalene*
chloronitric acid (1) Nitroxylchloride (2) Aqua regia
chloronitrobenzene See *nitrobenzene*
chloronitrophenol See *nitrophenol*
chloronitrous acid Nitrogen oxychloride
chlorophenesic acid Dichlor-*phenol*
chlorophenic acid Monochlor-*phenol*
chlorophenisic acid See trichlor-*phenol*
chlorophenol See *phenol* **c indophenol** An oxidation-reduction indicator, q v **c red** $C_{19}H_{12}Cl_2O_5S = 423\,0$ Dichlorophenolsulfonphthalein A yellow powder, used as pH-indicator between 5 5 (yellow) and 6 5 (red)
chlorophenusic acid Pentachloro*phenol*
chlorophoenicite The mineral $(Zn,Mn)_3As_2O_8 \cdot 7(Zn,Mn)(OH)_2$ It is pale green by reflected and purple red by transmitted light **magnesium-** C containing Mg in place of Zn
chlorophyll The chromoprotein forming the green coloring matter of leaves and other parts of a plant A soft, green mass, insoluble in water but soluble in alcohol, ether, chloroform carbon disulfide, essential oils, or alkalis The solutions are fluorescent and colloidal It contains

70 % chlorophyll *a*, or $C_{55}H_{72}MgN_4O_5 = 892\,9$,
30 % chlorophyll *b*, or $C_{55}H_{70}MgN_4O_6 = 908\,9$

The alcoholic solution of *a* is bluish green, of *b*, yellowish green Both are phytol esters of porphin derivatives Among its split products are phtopyrrole (related to hemopyrrole of blood), aetiophyllin $C_{31}H_{34}N_4Mg$, (the chromophore group containing Mg, as hematin contains Fe) It is used as a non-poisonous coloring matter, and as a dye for oils, cosmetics, etc It is marketed in the form of copper and zinc compounds *α-* The purified chlorophyll ($C_{31}H_{29}N_3Mg$)NH CO(COOMe)$COOC_{22}H_{33}$ Cf *phylloerythrin, phylloporphyrin*

chlorophyllide An ester of chlorophyllin, as, chlorophyll is the c of phytol

chlorophyllin a $C_{34}H_{32}N_4O_5Mg$ A dicarboxylic acid from chlorophyll *a* Cf *porphin*

chloropicrin CCl_3NO_2 = 164 39 Nitrochloroform, aquinite, trichloronitromethan*, P S Colorless liquid, d_9° 1 692, m −69, b 112, insoluble in water, miscible with alcohol or ether It is an insecticide and emetic war gas

chloroplast A granule containing chlorophyll, the green protoplasmic part containing the chlorophyll of vegetable cells

chloroplatinate Platinichloride A double salt of platinic chloride combined with another chloride, or a salt of chlorplatinic acid containing the divalent $PtCl_6$= radical

chloroplatinic acid H_2PtCl_6 = 410 0 A dibasic acid, the platinum chloride of commerce

chloroplatinite Platinochloride A double salt of platinous chloride and another chloride, a salt of platinous acid containing the divalent $PtCl_4$= radical

chloroplatinous acid H_2PtCl_4 = 339 0 A dibasic acid containing divalent Pt

chloroprene C_4H_5Cl = 88 5 *2*-Chloro-*1 3*-butadiene*, CH_2 CH CCl CH_2 A colorless liquid, d 0 9583, b 59 4, synthesized from acetylene, it polymerizes under proper conditions, to form *α-* a soft, plastic resembling unvulcanized rubber, *β-* a volatile, fragrant product, one fraction b_{27mm} 92–97, another b_{27mm} 114–118, *μ-* a transparent, resilient nonplastic, elastic product resembling vulcanized rubber, *ω-* a granular, nonplastic, non-absorbent, balata-like, hard, amorphous product, becoming plastic at 60°C It is used in the manufacture of duprene

chloropyridine See *pyridine*

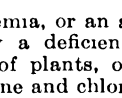
chloroquinoline C_9H_6NCl = 163 5 **(mono-)** A chlorine substitution product of quinoline

chlorosalol $C_{13}H_9O_3Cl$ = 248 53 Chlorphenol salicylate, chlorsalol, $C_6H_4(OH)COOC_6H_4Cl$ A colorless, crystalline powder, used as external antiseptic

chlorosamide $C_{21}H_{15}O_3N_2Cl_3$ = 449 52 Yellow scales, derived from chlorsalicylic acid and ammonia

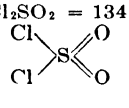
chlorosis (1) Anemia, or an abnormal condition characterized by a deficiency of hemoglobin, or, in the case of plants, of magnesium (2) The use of chlorine and chlorides in agriculture

chlorosulfonic acid HSO_3Cl = 132 5



Used in chemical warfare for fog screens

chlorosulfuric acid Cl_2SO_2 = 134 9 Sulfuryl chloride (Cl(O) S or



chlorotoluene Benzyl chloride

chlorotrinitrobenzene Picryl chloride

chlorous Describing a compound containing positive trivalent chlorine Cl≡, *e g*, chlorites

c acid $HClO_2$ = 68 5 An acid known only in solutions and as its salts (chlorites)

chlorovaleric acid Monochlorovaleric acid

chlorovalerisic acid Trichlorovaleric acid

chlorovalerosic acid Tetrachlorovaleric acid

chloroxalethylin $C_6H_9N_2Cl$ = 144 6 A tertiary amine derived from diethyl oxamide

chloroxalic acid Chloroxalethyline

chloroxalmethyline $C_4H_5N_2Cl$ = 116 5 A tertiary amine derived from dimethyl oxamide

chloroxalovinic acid $C_4HO_4Cl_5$ = 290 3 Pentachlorethyl-oxalic acid Colorless, hygroscopic crystals, soluble in water, alcohol or ether

chloroxyl A brand of cinchophen hydrochloride

chloroxylene Xylyl chloride

chloroxylonine $C_{22}H_{23}O_7N$ = 413 3 An alkaloid from the wood of *Chloroxylon swietenia*, the East Indian satinwood, a Rutaceae

chlorphenasic, chlorphenesic, chlorphenic, chlorphenisic, chlorphenosic See *chlorophen-*

chlorphenol See *phenol*

chlorxylene Xylyl chloride

chloryl (1) The monovalent ClO^- radical (2) Carbachol

chlorylene C_2HCl_3 = 131 38 Trichloro ethylene, CHCl = CCl_2 Colorless liquid, d 1 477, m −86 4, b 88, used as an antineuralgic

chocolate (1) A food preparation made from cocoa milk, and sugar which is variously flavored, and consumed either in solid cakes or used as a powder for beverages, etc (2) Theobroma paste Ground cocoa used as a basis for certain drugs

choke damp Black damp A mixture of CO_2 and other gases found in mines

chola Bile

cholagogue A drug that stimulates the flow of bile, *e g*, salicylates and bile salts

cholaic acid $C_{24}H_{40}O_2$ = 360 03 An acid derived from cholane

cholalic acid Cholic acid

cholane $C_{24}H_{42}$ = 328 39 A hydrocarbon parent-substance of sterols, hormones, bile-acids, and toad poisons It is related to the carotenoids and cerebrosides by ring fracture See table **c ring** Androstane ring A tetracyclic, saturated ring system See figure

cholanic acid $C_{24}H_{38}O_6$ = 361 3 An oxidation product of cholic acid

cholanthrene $C_{20}H_{14}$ = 254 0 A pentacyclic hydrocarbon with a strong carcinogenic action

cholate (1) A salt or ester of cholic acid, indicated by the $C_{24}H_{41}COO$— radical (2) Taurocholate A salt of taurocholic acid, indicated by the $C_{23}H_{39}O_3COO$— radical

choleate A salt or ester of choleic acid containing the monovalent $C_{23}H_{44}O_5NS$ COO— radical Cf *taurocholate*

cholecyanin Bilicyanin

choleic acid (1) Taurocholic acid (2) $C_{25}H_{42}O_4$ = 392 31 A monobasic acid from bile, m 190

glyco-, tauro- See *bile acids*

choleinic acid $C_{25}H_{42}O_4$ = 406 4 An acid found in small quantities in ox bile

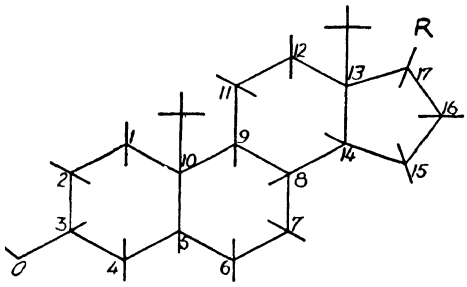
cholestane $C_{27}H_{48}$ = 372 35 A hydrocarbon, and stereoisomer of ergostane

cholestene $C_{27}H_{46}$ = 370 35 The unsaturated hydrocarbon of cholesterol

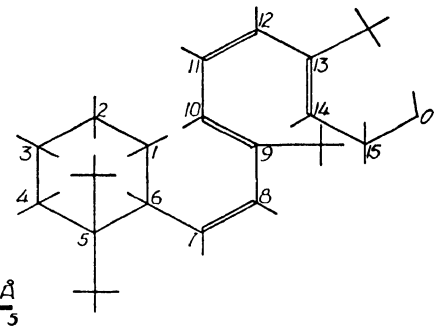
cholesterase An enzyme that hydrolyzes cholesterol

CHOLANE DERIVATIVES

(Compare also *carotenoids* and *cerebrosides*)



The Androstane or Cholane Ring



Vitamin A (Cf carotenoids)

Scale of Measurements in Å

0 5

The numbers represent carbon atoms, saturated unless otherwise specified, while R is a radical, as follows)

A	—CH_2Me	I	—CMe CH CH CO O
B	—CHOH Me		
C	—CO Me		
D	—CHMe COOH	J	—C CH O CO CH_2
E	—$CHMe(CH_2)_2COOH$	K	—$CHMe(CH_2)_2Me$
F	—CHMe CH CH CHMe $CHMe_2$	L	—$(CH_2)_4CONH(CH_2)_2SO_3H$
G	—$CHMe(CH_2)_3CHMe_2$	M	—$(CH_2)_4CONH\ CH_2\ COOH$
H	—CHMe CH CH CHEt $CHMe_2$	N	—$(CH_2)_4COOH$

Sterols	*Name (double bond)* (The numbers in parentheses indicate the position of the double bond)	*Substituents*		*R*
$C_{29}H_{48}O$	stigmasterol (5 6)	3—OH	10 13—Me	H
	cholesterol (5 6)	3—OH	10 13—Me	G
	allocholesterol (4 5)	3—OH	10 13—Me	G
$C_{27}H_{42}O$	ergosterol (5 6 7 8)	3—OH	10 13—Me	F
	lumisterol (6 7 8 9)	3—OH	10 13—Me	F
	protochysterol (6 7 8 14)	3—OH	10 13—Me	F
	tachysterol (7 8 13 17)	3—OH	10 13—Me	F
	calciferol (13 17 15 16)	3—OH	10 13—Me	F
$C_{27}H_{46}O$	coprosterol	3—OH	10 13—Me	G
$C_{27}H_{48}$	coprostane		10 13—Me	G
Corpus Luteum Hormones				
$C_{21}H_{32}O_2$	pregnenolone (5 6)	3—OH	10 13—Me	C
	pregnanedione	3=O	10 13—Me	C
$C_{21}H_{34}O_2$	pregnanolone	3—OH	10 13—Me	C
$C_{21}H_{30}O_2$	progesterone (5 6)	3=O	10 13—Me	C
$C_{21}H_{36}O$	pregnanediol	3—OH	10 13—Me	B
$C_{21}H_{32}O_2$	pregnenediol (5 6)	3—OH	10 13—Me	C
$C_{19}H_{26}O_2$	luteosterone (5 6)	3=O	10 13—Me	17 =O
$C_{21}H_{36}$	pregnane			A
Male Sex Hormones				
$C_{19}H_{28}O_2$	androstanedione	3=O	10 13—Me	17=O
$C_{19}H_{28}O_2$	dehydroandrosterone (5 6)	3—OH	10 13—Me	17=O
$C_{19}H_{26}O_2$	androstenedione (4 5)	3=O	10 13—Me	17=O
$C_{19}H_{30}O_2$	androsterone	3—OH	10 13—Me	17=O
$C_{19}H_{28}O_2$	testosterone (4 5)	3=O	10 13—Me	17=O
$C_{19}H_{32}O_2$	androstanediol	3—OH	10 13—Me	17—OH
$C_{19}H_{30}O_2$	androstanolone	3=O	10 13—Me	17—OH
$C_{19}H_{30}O_2$	androstenediol (4 5)	3—OH	10 13—Me	17—OH
$C_{19}H_{32}$	androstane		10 13—Me	
$C_{19}H_{30}$	androstene (4 5)		10 13—Me	
Female Sex Hormones				
$C_{18}H_{20}O_2$	equilin (1 2 3 4 5 10 7 8)	3—OH	13—Me	17=O
$C_{18}H_{24}O_2$	oestriol, theelol (1 2 3 4 5 10)	3—OH	13—Me	16 17—OH
$C_{18}H_{22}O_2$	oestrone, theelin (1 2 3 4 5 10)	3—OH	13—Me	17=O
$C_{18}H_{18}O_2$	equilenin (1 2 3 4 5 10)	3—OH	13—Me	17=O
$C_{18}H_{24}O_2$	dihydrooestrone (1 2 3 4 5 10 6 7 8 9)	3—OH	13—Me	17—OH
$C_{18}H_{30}$	estrane		13—Me	
$C_{18}H_{24}$	estratriene (1 2 3 4 5 10)		13—Me	
Digitalis Aglucones				
$C_{23}H_{32}O_6$	strophantidin	3 5 14—OH	10—CHO 13—Me	J

$C_{23}H_{34}O_5$	periplogenin	3 5 14—OH	10 13—Me	J
$C_{23}H_{34}O_4$	digitoxigenin	3 14—OH	10 13—Me	J
$C_{42}H_{76}O_3$	gitoxigenin	16—OH	3 10 13—Me	J
Toad Poisons				
$C_{26}H_{38}O_6$	bufotalin	3—OCOMe	7 12—OH 10 13—Me	I
Bile Acids				
$C_{24}H_{42}$	cholane		10 13—Me	K
$C_{24}H_{40}O_2$	cholanic acid		10 13—Me	E
$C_{24}H_{38}O_2$	cholenic acid (5 6)		10 13—Me	E
$C_{24}H_{38}O_3$	hydroxycholenic acid (5 6)	3—OH	10 13—Me	E
$C_{24}H_{40}O_3$	lithocholic acid	3—OH	10 13—Me	E
$C_{24}H_{40}O_4$	desoxycholic acid	3 12—OH	10 13—Me	E
	hydroxycholic acid	3 6—OH	10 13—Me	E
	chenodeoxycholic acid	3 7—OH	10 13—Me	E
$C_{24}H_{40}O_5$	cholic acid	3 7 12—OH	10 13—Me	E
	phocaecholic acid	3 7 23—OH	10 13—Me	E
$C_{22}H_{34}O_3$	hydroxycholanic acid (5 6)	3—OH	10 13—Me	D
$C_{26}H_{39}O_7NS$	taurocholic acid	3 7 12—OH	10 13—Me	L
$C_{26}H_{37}O_6N$	glycohydeoxycholic acid	3 6—OH	10 13—Me	M
$C_{24}H_{34}O_5$	dehydrocholic acid	3 7 12—OH	10 13—Me	N
Fragments formed by ring fracture due to oxidation of C—atoms to COOH				
$C_{24}H_{34}O_8$	bilianic acid (3 and 4 is COOH)	7 12=O	10 13—Me	E
$C_{25}H_{35}O_{10}$	choloidanic acid (3 and 4 is COOH)	12—COOH	10 13—Me	E
$C_{25}H_{34}O_{12}$	solannellic acid (3, 5, 6, 11 and 12 is COOH)		10 13—Me	E
$C_{19}H_{30}O_4$	etiobilianic acid (16 and 17 is COOH)		10 13—Me	E

cholesterate A salt or ester of the dibasic cholesteric acid, containing the $C_8H_8O_5$— radical

cholesteric acid $C_8H_{10}O_5$ = 186 1 Cholesterinic acid An oxidation product of choleic acid and cholesterol obtained by the action of HNO_3 Cf *ambreic acid*

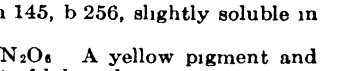
cholesterilene $C_{26}H_{42}$ = 354 7 An unsaturated hydrocarbon derived from cholesterol, it forms white crystals

cholesterin Cholesterol

cholesterinic acid Cholesteric acid

cholesterol $C_{27}H_{45}OH$ = 386 35 Cholesterin A monoatomic alcohol found in the blood, brain tissue, nerve substance, spleen, liver, bile, the principal constituent of gall-stones and certain cysts, prepared from the wool grease Pearly scales, d 1 067, m 148, insoluble in water, soluble in alcohol, ether, chloroform or acetone It is an antiseptic and antidote to the saponins and forms a number of esters which are important in metabolism For its structure see *cholane* **iso-** Lanosterol **thio-** $C_{27}H_{45}SH$ A solid, m 191 Cf *irradiation, sterols, lanisterol*

cholestrophan $C_5H_6N_2O_3$ = 142 06 Dimethyl parabanic acid,



Pearly leaflets, m 145, b 256, slightly soluble in water

choletelin $C_{16}H_{18}N_2O_6$ A yellow pigment and oxidation product of biliverdin

cholic acid $C_{24}H_{40}O_5$ = 408 32 Cholalic acid A monobasic acid formed by the hydrolysis of bile acids White crystals, m 198, insoluble in water soluble in alcohol or ether It is related to cholesterol and the terpenes Cf *cholane* **desoxy-** See *desoxycholic acid* **glyco-** See *glycocholic acid* **litho-** See *lithocholic acid* **rhizo-** An oxidation product of cholic acid **tauro-** See *taurocholic acid*

choline $C_5H_{15}O_2N$ = 121 26 Bilineurine, sinkaline, trimethyl-ethanol-ammonium hydroxide, oxyethyltrimethyl-ammonium hydroxide $Me_3N(OH)CH_2CH_2OH$ A ptomaine or quaternary amine occurring in many animal and vegetable tissues (placenta, fungi, seeds, etc) It is a viscous liquid, soluble in water or alcohol **acetyl-** See *acetyl* **hydroxy-** Muscarine **iso-** Amantine

c bases A group of quarternary amines containing pentalent nitrogen, and derived from ammonium hydroxide by replacing the hydrogen atoms by radicals choline, neurine, muscarine, betaine and sinapine **c borate** Enzytol A proprietary compound used in the treatment of cancer **c chloride** $C_5H_{14}ClO_2N$ = 155 5 Colorless, hygroscopic crystals, soluble in water or alcohol **c hydrochloride** C chloride

cholinic acid $C_{50}H_{86}O_6\,6H_2O$ = 840 38 An acid derived from bile

cholodinic acid $C_{24}H_{38}O_6$ = 422 30 An anhydrous product of cholic acid

cholohematin Bilipurpurin A brown bile pigment

choloidanic acid $C_{16}H_{24}O_7$ = 328 19 An oxidation product of cholic acid

chololic acid Cholic acid

cholonic acid $C_{26}H_{41}O_5N$ = 447 34 An anhydrous product of glycocholic acid

cholophaein $C_{16}H_{18}O_4N_2$ = 302 16 A brown biliary pigment occurring in feces Cf *choletelin*

cholothallin $C_9H_{11}O_3N$ = 181 10 An oxidation product of bilirubin

chondrigen Cartilagin

chondrin A protein from cartilage, considered to be a mixture of mucin and gelatin A transparent, gelatinous or yellow, horn-like mass, soluble in hot water

chondrodite Humite

chondroine $C_{18}H_{21}O_4N$ = 315 2 An alkaloid obtained from *Nectandra rodiaei*, a Lauraceae of tropical America Cf *bebeerine*

chondroitic acid $C_{18}H_{27}O_{17}NS$ = 561 30 An acid of cartilage, found in traces in urine, splits into chondroitin

chondroitin $C_{18}H_{27}O_{14}N$ = 481 22 A mucus-like substance and constituent of chondrin and chondroitic acid, it hydrolyses to chondrosin and acetic acid

chondrometer An instrument for determining the weight of a bushel of grain or seed

chondromucoid An albuminoid containing conjugated chondroitic acids, a constituent of cartilage

hondroprotein A group of mucoids containing chondroitic acid, found in the connective tissues

hondrosin $C_{12}H_{21}O_{11}N$ = 355 18 A split-product of chondroitin, it hydrolyzes to glycuronic acid and glucosamine Cf *chitosan*

Chondrus A family of sea weeds, *e g* , Irish moss

hopping Cutting **c mill** A device for shredding and cutting fibrous materials, agar-agar, seeds, etc

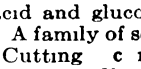
horitoid $Al_2O_3\ FeO_2\ SiO_2\ H_2O$ A silica mineral, (q v) of the mica group

horoid The layer below the retina of the eye

hrithmene Crithmene

hroatol $C_{10}H_{16}\ 2HI$ = 391 8 Terpene iodohydrate A greenish oil, obtained by the action of iodine on turpentine

hroma The degree of saturation of a color

hroman $C_9H_8O_2$ = 148 1 Dihydrobenzopyran,  **hydrindo-** Hydrindochroman **thio-** Thiochroman

hromate A salt of chromic acid which contains the divalent $CrO_4^=$ radical, as, Na_2CrO_4 sodium c **bi-, Di-, di-** An acid salt derived from chromic acid containing the divalent $Cr_2O_7^=$ radical The $Cr_2O_7^{--}$ ion, which makes aqueous solutions orange **per-** See *perchromate* **c cell** See *cell* **c green** A mixture of chrome yellow (q v) and prussian blue (cf *chrome green*) **c ion** The negatively charged CrO_4^{--} ion, which imparts a yellow color to aqueous solutions

hromatic Pertaining to colors **c aberration** The refraction of the different constituent rays of white light by a lens, to different extents, it produces differently colored foci, and an image fringed with color **c plate** A photographic plate which is used in conjunction with color screens in order to produce a more contrasting image of colored objects Cf *photographic spectrum, photosensitizer* There are four main groups of plates and films

	Sensitive to	*Wavelength in Å U*	*Name*
(1)	violet and blue	3500–5000	ordinary plates
(2)	violet, blue and green	3500–6000	*iso-* or *ortho-*chromatic plates
(3)	violet blue and orange	3500–6500	*tri*chromatic plates
(4)	violet, blue and red	3500–7000	*pan*chromatic plates

hromatin A structural part of the nucleus of the cell that is most deeply colored by stains

hromatographic Recording colors **c analysis** The analysis of mixtures of solutions (*e g* , of drugs, dyestuffs, etc) by using absorbing materials such as gelatin, alumina, etc to separate the substances in solution by selective adsorption

hrome (1) Chromium (2) Chromium ore (3) Chromium oxide (4) Lead chromate **c alum** Ammonium chromic sulfate **c green** A mixture of chromic oxide and cobalt oxide **c ore** Chromite **c red** Lead chromate **c violet** Aurine tricarboxylic acid **c yellow** Lead chromate

chromel An alloy highly resistant to heat, oxidation and the action of acids, and used in thermocouples and in the laboratory (*e g* , for triangles) Grades

A	80 % Ni	20 % Cr	
B	85 % Ni	15 % Cr	
C	65 % Ni	11 % Cr	24 % Fe
D	26 % Ni	8 % Cr	66 % Fe
P	90 % Ni	10 % Cr	

chromic Describing a compound containing trivalent chromium $Cr^{\equiv}$ **c acetate** $Cr(C_2H_3O_2)_3H_2O$ = 247 09 A grayish-green powder, soluble in water **c acid** (1) H_2CrO_4 = 118 1 The hypothetical hydrate of CrO_3, which exists only in solution or in the form of salts (2) CrO_3 Chromium trioxide **c anhydride** Chromium trioxide **c arsenide** Chromium arsenide **c boride** Chromium boride **c bromide** (1) $CrBr_3$ = 291 76 Olive green, hexagonal crystals, slightly soluble in water, decomp in alcohol (2) $CrBr_3\ 6H_2O$ = 399 85, c b hexahydrate Green scales, d 5 4, insoluble in water or alcohol **c carbide** Cr_3C_2 = 180 06 A black powder, d 5 62, insoluble in water **c carbonate** $Cr_2(CO_3)_3$ An amorphous, grayish-black powder of variable composition, containing some hydroxide, insoluble in water, soluble in acids **c chloride** (1) $CrCl_3$ = 158 38 A purple crystalline powder, d 2 757, soluble in water, alcohol or ether (2) $CrCl_3\ 6H\ O$ = 266 48 Green or purple, shining scales, d 5 5, soluble in water, alcohol or ether **c fluoride** $CrF_3\ 4H_2O$ = 181 1 A green, crystalline powder, d 3 8, m 1000, b about 1200, soluble in water, alcohol, or acids, used technically in dyeing and printing cotton, and coloring white marble **c hydroxide** $Cr(OH)_3\ 2H_2O$ = 139 1 A bluish-green powder insoluble in water or alcohol, soluble in alkalis or acids, used as a pigment **c iodide** $CrI_3\ 9H_2O$ = 437 9 A dark blue or black powder, soluble in water **c nitrate** $Cr(NO_3)_3\ 9H_2O$ = 400 2 Purple prisms, m - 36 5, b 125 5, soluble in water, alcohol, acids, or alkalis, used as a reagent It crystallizes also as

heptahydrate	$Cr(NO_3)_3\ 7H_2O$
hexammonate	$Cr(NO_3)_3\ 6NH_3$

c oxide Cr_2O_3 = 152 0 Chrome green A hexagonal, dark-green, crystalline powder, d 5 21, m 2059, insoluble in water, slightly soluble in alkalis or acids, used as pigment in calico printing, and paper money, also in ceramics and glass industry **c oxychloride** Chromyl chloride **c phosphate** $CrPO_4$ = 147 1 Plessy's green, Arnaudon's green A bluish-green powder, insoluble in water, used as a pigment It crystallizes also as

trihydrate	$CrPO_4\ 3H_2O$
hexahydrate	$CrPO_4\ 6H_2O$

c potassium alum Potassium c sulfate **c potassium cyanide** Potassium chromicyanide **c potassium oxalate** $K_3Cr(C_2O_4)_3 \cdot 3H_2O$ = 487 35 A purple crystalline mass, soluble in hot water **c potassium sulfate** Potassium c sulfate **c silicide** Cr_3Si_2 = 212 1 A black crystalline powder, insoluble in water **c sulfate** $Cr_2(SO_4)_3$ = 392 2 A green powder soluble in water, used in manufacturing chromic compounds It crystallizes as

hexahydrate $Cr_2(SO_4)_3\,6H_2O$ (green)
pentadecahydrate $Cr_2(SO_4)_3\,15H_2O$ (violet)

(cryst) $Cr_2(SO_4)_3\,18H_2O$ = 716 5 Regular, purple or violet crystals, $d_{22°}$ 1 7, anhydrous at 100 and soluble in water Used in the manufacture of green inks and in the preparation of other chromium compounds **c sulfide** Cr_2S_3 = 200 6 A dark-green powder, d 3 77, insoluble in water, soluble in acids **c tartrate** $Cr_2(C_4H_4O_6)_3$ = 548 5 Dark-purple scales, soluble in water

chromicyanide The trivalent radical $Cr(CN)_6\equiv$, occurring in compounds such as potassium chromicyanide $K_3Cr(CN)_6$ **c ion** The trivalent negative ion, $Cr(CN)_6^{---}$, it imparts a yellow color to solutions

chromite (1) An oxide of iron and chromium containing 68 % of chromic oxides It occurs in brown or black streaked masses, principally in Asia Minor, and is a source of chromium salts, d 4 3–4 6, hardness 5 5 It is used for refractory bricks and cements, for making chromium compounds or ferrochrome, and for coloring glass and tiles green (2) A salt of chromous acid containing the monovalent CrO_2— radical **thio-** A compound of the type $M_2Cr_2S_4$

c ion The negatively charged CrO_3^{--} ion, derived from chromous acid or the chromites

chromitite The mineral Fe_2O_3,Cr_2O_3

chromium Cr = 52 01 An element, atomic number 24 A silver-white, hard, brittle metal, d 6 91, m 1520, insoluble in water, but dissolved rhythmically by acids (active and passive chromium) It was discovered in 1797 by Vauquelin and occurs principally in chromite C is prepared from ores by reduction with metallic aluminum (thermite process), and is used in corrosion-resistant alloys and as a constituent of engineering steels for heavy duty machinery C compounds are poisonous and variously colored They are di-, tri-, or hexavalent, and form the following series of compounds

+2 chromous (blue)	Cr^{++}
+3 chromic (purple)	Cr^{+++}
chromites (green)	CrO_2^-
+6 chromyl (red)	CrO_2^{++}
chromates (yellow)	CrO_4^{--}
dichromates (orange)	Cr_2O^{--}

The reactions of c or the change from one to the other series of compounds, depend on the stability of its ions in acid or basic solution viz

In acid solution		*In alkaline solution*	
Reduction	Cr^{+++} green or violet	CrO_2^- green	Oxidation
	$Cr_2O_7^{--}$ orange	CrO_4^{--} yellow	

c acetate See *chromous* **c arsenide** CrAs = 127 1 Chromic arsenide A black crystalline powder, d 6 35, insoluble in water **c boride** CrB = 63 1 Chromic boride A black powder, insoluble in water **c chloride** See *chromic, chromous, chromyl* **c dioxide** CrO_2 = 84 1 A black powder obtained by the reduction of potassium dichromate by sodium thiosulfate It is regarded as chromic chromate, $Cr_2O_3\,CrO_3 = 3CrO_2$ **c minerals** Chromium is common in magnesium rocks and occurs widely in nature Its chief ores are chromite, $FeCr_2O_4$, crocoite, $PbCrO_4$, knoxvillite, $CrSO_4$ **c mordants** A group of chromium compounds *e g*, used in tanning and dyeing, such as sodium dichromate, chrome alum, or chromic fluoride **c oxides** See *chromous oxide, chromic oxide (green), chromium dioxide (black), chromium trioxide (red)* **c phosphide** CrP = 83 2 A black powder, insoluble in water, decomp in acids **c plating** The electrolytic coating of metals with c which produces a noncorrosive surface **c potassium oxalate** $K_3Cr(C_2O_4)_3\,H_2O$ = 487 36 Violet crystals, soluble in water **c trioxide** CrO_3 = 100 01 Chromic acid anhydride Fine, crimson-colored needles, m 190, very soluble in water, readily reduced to the green oxide It is one of the most powerful of oxidizing agents

chromo A paper which has been coated with a mixture of a white pigment (*e g*, china clay, blanc fixe etc) and an adhesive (*e g* casein), it is used to obtain fine color prints

chromogen (1) The parent-substance of a dyestuff, or of a compound which produces a colored substance or pigment (2) The substances in biological liquids which, on oxidation, form colored compounds as, sepia, indigo, and fruits Cf *chromophore, auxochrome, dulcigen*

chromogenic Pertaining to a chromogen **c bacteria** Bacteria which produce colored substances, as, a yellow or blue color in milk

chromoisomerism Chromotropy

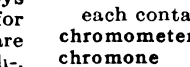
chromoisomers Differently colored modifications of a substance Cf *chromotropy*

chromolipoid Lipochrome

chromomere A structural unit of a chromosome, each contains a gene, q v

chromometer Colorimeter

chromone $C_9H_6O_2$ = 146 0 γ-benzopyrone, 1 4-benzopyrone The heterocyclic compound



It is present in many vegetable pigments, and its derivatives are chromones, flavones, pyrones, etc **2-phenyl-** Flavone **3-phenyl-** Isoflavone

chromophore A structural arrangement of atoms which is common to many organic substances that possess color It is thought that the cause of color is the vibrating electrons of a shifting double bond, the chromophoric group Cf *resonator, constellation, phore*

chromophoric Having properties of a chromophore **c group** The nitro-, azo-, quinoid-, and —C CH CO— radicals, in which there is a possibility of a shifting double bond See *chromophore, auxochrome*

chromophotometer Colorimeter

chromoplast The micelles of coloring matter in plant cells

chromoproteins A conjugated protein (or compound of a protein) and a chromophore, as, hemoglobin, chlorophyll, etc Cf *cytochrome*

chromosaccharometer A device for determining sugar in urine colorimetrically

chromoscope A device for measuring and comparing colors

chromosome A differentiated protoplasm formed from the chromatin of the nucleus during cell-division The number of c is constant in

every species of animals, but may differ for different species Cf *karyokinesis*

hromosphere A gaseous "atmosphere" surrounding the sun and composed mainly of hydrogen, helium and calcium vapors Cf *photosphere, corona* The gases of the c are responsible for the Fraunhofer lines

hromotropic acid *1 8*-Dihydronaphthalene-*3 6*-disulfonic acid, used as an intermediate

hromotropy Chromoisomerism The phenomenon, shown by certain substances, of occurring in differently colored forms (chromoisomers)

hromous A compound of divalent chromium, Cr = **c acetate** $Cr_2(C_2H_3O_2)_6\,2H_2O$ = 494 - 24 A bluish-green soft mass, soluble in water, used in calico printing and as a stain **c acid** $HCrO_2$ or HO CrO A blue-gray powder, a weak acid which yields chromites **c chloride** $CrCl_2$ = 123 0 White crystals, $d_{14°}$ 2 76, soluble in water, it forms a blue solution which absorbs oxygen **c hydroxide** $Cr(OH)_2$ = 86 0 A yellowish-brown powder, decomp when heated, insoluble in water, sparingly soluble in acids **c iodide** CrI_2 = 306 0 White crystals or powder, soluble in water **c oxalate** $Cr(OOC)_2$ = 140 1 Dark-green scales, soluble in hot water **c oxide** CrO = 68 04 Chromium monoxide An unstable compound known in the hydrated state **c sulfate** $CrSO_4\,7H_2O$ = 274 2 Blue crystals, soluble in water, slightly soluble in alcohol

hromyl The divalent radical, CrO_2^{--}, containing hexavalent chromium **c amide** $CrO_2(NH_2)_2$ = 116 1 **c chloride** CrO_2Cl_2 = 155 0 Chromic oxychloride, chlorochromic acid A dark-red fuming liquid, d 1 96, b 116, decomp in water or alcohol, and is a powerful oxidizing agent

hronic Long-continued or lingering, cf *acute*

hronograph An instrument for recording small intervals of time

hronometer A watch or clock

hronoscope A device for measuring very brief intervals of time

hronoteine A high-speed moving picture camera consisting of 48 rotating lenses, used for the study of rapid moving machinery or phenomena (detonations) It takes normally 3200 pictures per second, but can be speeded up to take 10 000 exposures per second Cf *stroboscope*

hrysalicic acid $C_7H_5O_6N_3$ = 227 06 Dinitro-o-aminobenzoic acid An isomer of chrysanisic acid

hrysamine $Na_2C_{18}H_{16}O_6N_4$ = 430 17 Flavophenine A yellow azo-dye, obtained from benzidine and toluidine

hrysammic acid $C_{14}H_2(NO_2)_4(OH)_2O_2$ = 420 14 Chrysamminic acid, tetra nitrochrysazin A dibasic acid constituent of aloes prepared by the action of HNO_3 on chrysophanic acid It is a solid, insoluble in water, soluble in alcohol or ether

hrysammidic acid $NH_4C_7HO_2(NO_2)_2$ Ammonium chrysammate A derivative of chrysammic acid

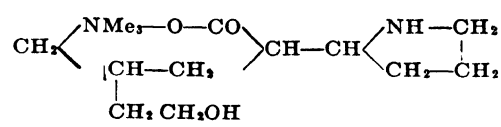
hrysamminic acid Chrysammic acid

hrysanilic acid A decomposition product of indigo blue

hrysaniline $C_{19}H_{15}N_3$ = 285 2 ms-p-amidophenyl-2-amidoacridine A derivative of acridine Yellow crystals, m 268

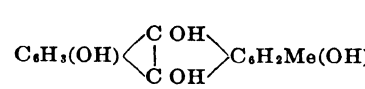
hrysanisic acid $C_7H_5O_6N_3$ = 227 06 $NH_2C_6H_2(NO_2)_2COOH$ 3 5-dinitro-4-aminobenzoic acid Colorless crystals, m 259 An isomer of chrysalic acid

chrysanthemine $C_{14}H_{28}O_3N_2$ = 273 3 The alkaloid



found in some chrysanthemum species

chrysarobin $C_{15}H_{12}O_4$ = 256 1 A neutral principle from goa powder, the exudates of *Andira (Vouacapoua) araroba*, a Brazilian tree (Leguminosae)



A microcrystalline, yellow powder, insoluble in water, soluble in alcohol, ether, chloroform or alkalis On oxidation it yields chrysophanic acid Used as a gastro-intestinal antiseptic, antiparasitic and alterant, and externally in skin diseases **c tetraacetate** Lenirobin **c triacetate** Eurobin

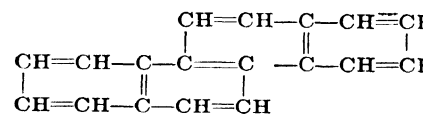
chrysatropic acid Scopoletin

chrysazin $C_{14}H_8O_4$ = 240 13 1 8-dihydroxy anthraquinone, $C_{14}H_6O_2(OH)_2$ A solid, slightly soluble in alcohol or ether, m 280 **tetranitro-**Chrysammic acid

chrysazol $C_{14}H_{10}O_2$ = 210 1 1 9-dioxyanthracene, peri-dihydroxyanthracene, 1 8-anthradiol A phenol derived from anthracene, used in the dye industry

chryseam $C_4H_5N_3S_2$ = 159 8 White crystals, a reagent for nitrites (red color)

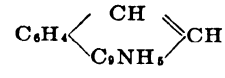
chrysene $C_{18}H_{12}$ = 228 19 Benzophenanthrene The hydrocarbon



Red fluorescent scales, m 250, b 448, slightly soluble in alcohol, ether or water It is a constituent of coal tar

chrysenic acid $C_{16}H_{11}COOH$ = 248 1 Beta-phenyl-naphtholcarboxylic acid A monobasic acid derived from chrysene

chrysidine $C_{17}H_{11}N$ = 229 2 The compound



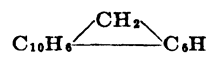
chrysin $C_{15}H_{10}O_4$ = 254 1 5 7-dihydroxy flavone, 2-phenyl-5 -7-dihydroxy-1 4-benzopyrone A flavone in poplar buds, a derivative of benzopyrone, m 275

chrysoberyl $BeAl_2O_4$ A golden yellow beryllium aluminate, d 3 5–3 8, sometimes used as gem Cf *alexandrite*

chrysocolla $CuH_2SiO_4\,H_2O$ Copper orthosilicate A bluish-green mineral, d 2 0–2 2

chrysofluorene $C_{17}H_{12}$ = 216 1 Naphthylene-phenylene-methane, 1 2-benzofluorene, α-naph-

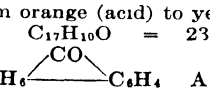
thofluorene The hydrocarbon



Colorless crystals, m 180

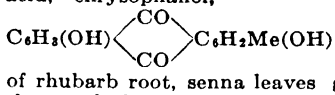
chrysoidin $C_7H_{22}O_4$ = 170 2 A yellow pigment in asparagus berries

chrysoidine $C_{12}H_{13}N_4Cl$ = 248 66 Diamino-azobenzene or 4-phenylazo-m-phenylene diamine hydrochloride **c orange** A red-brown powder, very soluble in water or alcohol, used as a disinfectant, dye and indicator, changing at pH 7 0 from orange (acid) to yellow (basic)

chrysoketone $C_{17}H_{10}O$ = 230 1 The ring system  A crystalline substance, m 130

chrysolepic acid Picric acid

chrysolite Olivine

chrysophanic acid $C_{15}H_{10}O_4$ = 254 1 *4 5*-Dihydroxy-*2*-methylanthraquinone, parietic acid, chrysophanol,  A constituent of rhubarb root, senna leaves goa powder and the wood of *Vouacapoua araroba* Yellow crystals, used as a mild laxative Cf *rhein*

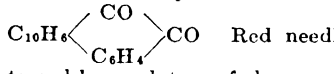
chrysophanin $C_{20}H_{20}O_9$ = 404 2 A glucoside in rhubarb and senna

chrysophanol Chrysophanic acid

chrysophyscin Physcion

chrysopicrin Vulpic acid

chrysoprase An apple-green opaque variety of chalcedony, used as a gem

chrysoquinone $C_{18}H_{10}O_2$ = 258 1 Chrysene quinone, *1 2*-chrysene dione The ring system  Red needles, m 235, obtained by oxidation of chrysene

chrysorrhetin A yellow coloring matter of senna

chrysotile $3MgO,2SiO_2,2H_2O$ Canada asbestos An impure hydrated magnesium silicate It is a form of asbestos

chrysotoxin An active principle of ergot

chuchuarine $C_{20}H_{15}O_2N_{12}$ = 455 2 An alkaloid from the seeds and wood of *Semecarpus anacardium*, an Anacardiaceae of the East Indies It resembles strychnine

chum The sediment in fatty oils

chundoo See *chandoo*

churn A device for agitating milk in making butter **laboratory-** A c used in experimental dairy work and household science, or for making intimate mixtures

churning The slow stirring or agitating of milk or cream with wooden paddles, shaking, etc by which the fat globules aggregate to form butter

chyazic acid Hydrocyanic acid The name is derived from C—Hy—Az, where Az is the French, azote

chyle An emulsion of lymph and fat formed in the small intestines during digestion, and passing through the thoracic duct into the veins as blood

chymase A coagulating enzyme (q v) that acts on casein

chyme A thick, brownish or gravish liquid consisting of partly digested food, passing from the stomach into the intestines

chymia An obsolete term for chemistry

chymification Gastric digestion

chymogen Rennase

chymosin Rennase

chymotrypsin An enzyme which coagulates milk

cibazol Sulphanilamido-thiazole

ciceric acid A mixture of oxalic and malic acid obtained from *Cicer arietinum*, *Vicia sativa* and other vetches

Cicuta A genus of poisonous umbelliferous plants, as *C virosa* or water-hemlock

cicutene $C_{10}H_{16}$ = 136 2 A volatile terpene obtained from the root of *Cicuta virosa*

cicutine $C_8H_{17}N$ = 127 2 A liquid alkaloid obtained from the root of *Cicuta virosa*, apparently identical with conine

cicutoxine $C_{12}H_{32}O_5$ = 256 3 An active principle of *Cicuta virosa*

cider Expressed apple juice, fermented or otherwise, which is used for drinking and vinegar manufacture Cf *pomace, perry*

C I E (Commission Internationale de l'Éclairage) Units which define colors in terms of 3 hypothetical primary colors which, when mixed optically, match the color under standard lighting conditions Cf *color*

cignolin A brand of dioxyanthranol

cilia The hair-like protuberances on the surface of micro-organisms, used chiefly for locomotion

ciment fondu A form of hydraulic cement, formed by the complete fusion of bauxite and lime to form monocalcium aluminate and dicalcium silicate

cimicic acid $C_{15}H_{28}O_2$ = 240 3 A monobasic acid from bed bugs, *Cimex lectularius*, yellow crystals, m 44 2

Cimicifuga Macrotis, black cohosh, black snakeroot The rhizome of *C racemosa*, black snakeroot or cohosh, used, as tincture or fluid extract, as a tonic and antispasmodic Cf *rasmosin, macrotoid*

cimicifugin Macrotin A resinoid from the rhizome of *Cimicifuga racemosa* A yellowish-brown powder, insoluble in water, soluble in alcohol, used as an antispasmodic and nervine tonic

cimifuga Cimicifuga

cimmol Cinnamyl hydride

cina Santonica

cinaebene $C_{10}H_{16}$ = 136 2 A hydrocarbon from the essential oil of *Artemisia santonica* **c camphor** $C_{10}H_{18}O$ = 154 2 A camphor, the chief constituent of the essential oil of *Artemisia santonica* Cf *santonica*

cinchaine $C_{22}H_{30}O_2N_2$ = 330 3 *1*-propyl-hydrocupreine A cinchona alkaloid used as anesthetic

cinchamidine $C_{19}H_{24}ON_2$ = 296 3 Hydrocinchonidine An alkaloid from cinchona bark White leaflets, m 230, insoluble in water

cinchene $C_{19}H_{20}N_2$ = 276 3 An alkaloid obtained from cinchonine by boiling with alcoholic KOH

cinchocerotin $C_{27}H_{48}O_2$ = 404 38 A white crystalline substance derived from callisaya extract

cinchofulvic acid Cinchona red

cinchol $C_{20}H_{34}O$ = 290 3 An alcohol from cinchona resembling cholesterol

cincholepidine Lepidine

cincholine An alkaloid from cinchona bark

cinchomeronic acid $C_7H_5O_4N$ = 167 14 A dibasic acid derived from quinine dicarboxy-

pyridine, *3 4*- or 2 3-pyridine dicarboxylic acid Colorless crystals m 266 **iso-** 1 4-pyridine dicarboxylic acid Colorless leaflets, m 236, slightly soluble in water, alcohol or ether **carbo-** 1 2 3-pyridine tricarboxylic acid Colorless crystals, m 250 **methyl-** Picoline dicarboxylic acid

cinchona (1) Quina, china, quina, Jesuit's bark, loxa bark, huanco bark, Peruvian bark, fever bark The bark of *Cinchona* species containing at least 3 % of cinchona alkaloids, used as a tonic and febrifuge (2) A genus of trees of the Rubiaceae found in the Andes and cultivated in Ceylon and Java The following species yield barks

C callisaya	callisaya bark
C ledgeriana	yellow bark
C cordifolia	Cartagena bark
C officinalis	crown or loxa bark
C succirubra	red or cusco bark

c alkaloids The alkaloids in cinchona, the more important are quinine, quinidine, cinchonine, cinchonidine **c tannin** Quinotannic acid

cinchonamine $C_{19}H_{24}ON_2$ = 296 3 An alkaloid from the bark of *Remijia purdieana*, a Rubiaceae Yellowish-white crystals, m 184, insoluble in water, soluble in alcohol or chloroform **c hydrochloride** $C_{19}H_{24}ON_2$ HCl H_2O = 350 78 Yellow crystals, soluble in water or alcohol **c nitrate** $C_{19}H_{24}ON_2$ HNO_3 = 359 32 Colorless or slightly yellow crystals, slightly soluble in water or alcohol **c sulfate** $C_{19}H_{24}ON_2$ H_2SO_4 = 394 39 Colorless crystals, soluble in water, said to have six times the therapeutic effect of quinine sulfate

cinchonane $C_{19}H_{22}N_2$ = 278 19 Desoxycinchonine Colorless crystals, m 92

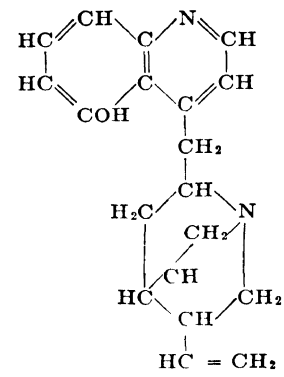
cinchonate A salt of cinchonic acid, containing the trivalent $C_{11}H_{12}O_9\equiv$ radical

cinchonic acid $C_8H_9(OH)_3(COOH)_3$ = 291 12 A tribasic acid formed by reduction of cinchomeronic acid **methyl-** Aniluvitonic acid

cinchonicine Cinchotoxine

cinchonidine $C_{19}H_{22}ON_2$ = 294 3 Chinidine The *levo-* isomer of cinchonine and an alkaloid obtained from cinchona bark White crystals, m 205, insoluble in water, slightly soluble in ether, soluble in alcohol, chloroform or dilute acids It is an antiperiodic, tonic and is used in heart diseases **hydro-** Cinchamidine **c borate** $C_{19}H_{22}ON_2$ H_2BO_3 = 356 31 A white powder, soluble in alcohol **c dihydrobromide** Blennostasin **c hydrobromide** $C_{19}H_{22}ON_2$ 2HBr = 456 15 Yellow prisms, soluble in water **c hydrochloride** $C_{19}H_{22}ON_2$ HCl + H_2O = 348 8 Colorless prisms, soluble in water, alcohol, or chloroform **c hydroiodide** $C_{19}H_{22}ON_2$ HI $2H_2O$ = 458 23 Yellow crystals, soluble in water or alcohol **c salicylate** $C_{19}H_{22}ON_2$ $C_7H_6O_3$ = 432 34 A white microcrystalline powder, soluble in alcohol **c sulfate** $(C_{19}H_{22}ON_2)_2$ H_2SO_4 $3H_2O$ = 740 7 Colorless crystals, soluble in water, used similarly to quinine sulfate **c tannate** A pale-yellow, amorphous powder of variable composition, soluble in alcohol **c tartrate** $(C_{19}H_{22}ON_2)_2$ $C_4H_6O_6$ $2H_2O$ = 774 66 White crystals, soluble in hot water or hot alcohol

cinchonine $C_{19}H_{22}ON_2$ = 294 29 An alkaloid from various species of cinchona bark, the *dextro-* isomer of cinchonidine



Colorless crystals, m 240–250, b 448, slightly soluble in alcohol, water, or ether, soluble in chloroform or dilute acids It is an antiperiodic and bitter tonic, used as a substitute for quinine, and as a spot reagent for bismuth (orange-red) **hydro-** Cinchotine **hydroxy-** Cupreine **pseudo-** Cinchotine

c benzoate $C_{19}H_{22}ON_2$ $C_7H_6O_2$ = 416 34 Colorless or slightly yellow crystals, slightly soluble in water, soluble in alcohol or chloroform **c bisulfate** $C_{19}H_{22}ON_2$ H_2SO_4 $4H_2O$ = 464 43 Colorless, cubic crystals, soluble in water or alcohol **c ferrocitrate** Yellow scales, soluble in water **c hydrobromide** $C_{19}H_{22}ON_2$ HBr = 375 22 Colorless crystals, soluble in water or alcohol **c hydrochloride** $C_{19}H_{22}ON_2$ HCl $2H_2O$ = 366 79 Colorless monoclinic needles slightly soluble in water, soluble in alcohol or ether **c iodosulfate** Antiseptol, iodochinchonine sulfate A brown powder, insoluble in water, soluble in alcohol, contains 50 % I Used as a dusting powder and substitute for iodoform **c nitrate** $C_{19}H_{22}ON_2$ HNO_3 H_2O = 375 32 White crystals soluble in water **c salicylate** $C_{19}H_{22}ON_2C_6H_6O_3$ = 432 34 White or pinkish crystals soluble in hot water or alcohol, used for rheumatism **c sulfate** $(C_{19}H_{22}ON_2)_2$ H_2SO_4 $2H_2O$ = 722 69 Colorless rhombic crystals, m 198, slightly soluble in water, soluble in alcohol Used as an antiperiodic and tonic, as a reagent for bismuth, hydrochloric acid, or sulfite cellulose, in tanning extracts and in preparing leathers

cinchoninic acid $C_{10}H_7O_2N$ = 173 1 Alpha-quinoline-monocarboxylic acid, 4-quinoline carboxylic acid A monobasic, colorless, crystalline, acid obtained by oxidation of cinchonine **methyl-** Aniluvitonic acid **2-phenyl-** Atophan

cinchophen Atophan

cinchotannic acid Quinotannic acid

cinchotenicine $C_{18}H_{20}O_3N_2$ = 312 4 An amorphous alkaloid from cinchona bark, which is isomeric with cinchotenine

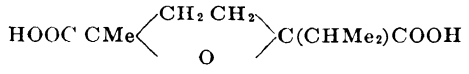
cinchotenidine $C_{18}H_{20}O_3N_2$ $3H_2O$ = 366 4 A colorless crystalline alkaloid from cinchona bark, which is isomeric with cinchotenine

cinchotenine $C_{18}H_{20}O_3N_2$ 3H O = 366 4 A colorless crystalline alkaloid produced by the oxidation of cinchonine

cinchotine $C_{19}H_{24}ON_2$ = 296 4 Hydrocinchonine, ψ-cinchonine An alkaloid, m 286, from various species of cinchona bark and cuprea bark, prepared artificially by the oxidation of quinine with $KMnO_4$

cinchotoxine $C_{19}H_{22}ON_2$ = 294 19 Cinchonicine An alkaloid, m 59, obtained by heating cinchonine or cinchonidine

cinene Terpene
cineole Eucalyptole
cineolic acid $C_{10}H_{16}O_5$ = 216 12 The dibasic acid, HOOC CMe(CH$_2$ CH$_2$)O CMe$_2$ CH COOH **levo-** Colorless crystals, d 0 92, m 196, decomp in water **1 4-** Ascaridolic acid The dibasic acid



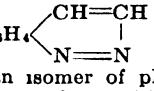
cinnabar HgS A native red mercuric sulfide
cinnaldehyde Cinnamaldehyde
cinnamal Cinnamilidene The bivalent radical PhCH CH CH== or C_9H_8==
cinnamaldehyde C_9H_8O = 132 11 Cinnamic aldehyde, beta-phenylacrolein, benzal-acetaldehyde or cinnamyl aldehyde, *3*-phenyl-propenal* PhCH CHCHO A yellow volatile liquid, d_4° 1 050, m −7 5, b 245 Chief constituent of oil of cinnamon, cinnaldehyde, and cassia Used as an itch remedy, and in artificial flavors **hydroxy-** Coumaraldehyde **hydroxymethoxy-** Ferulaldehyde
cinnamamide C_9H_9ON = 147 1 Benzalacetamide PhCH CHCONH$_2$ Colorless crystals, m 141 5, soluble in alcohol **hydro-** Hydrocinnamamide
cinnamate A salt of cinnamic acid containing the monovalent $C_9H_7O_2$— radical
cinnamein $C_9H_9O_2C_7H_7$ = 238 11 Benzylcinnamate An ester obtained from Peru and tolu balsams A colorless liquid, also obtained by heating sodium cinnamate with benzyl chloride
cinnamene Styrene **aceto-** Benzylidene acetone
cinnamenyl Styryl The monovalent radical, Ph CH CH—, or C_8H_7—, derived from cinnamene **c acetone** $C_{12}H_{12}O$ = 172 1 C_8H_7CH CHCOMe Colorless crystals, m 68 **c acrylic acid** $C_{11}H_{10}O_2$ = 174 1 A monobasic acid C_8H_7CH CHCOOH derived from cinnamaldehyde Colorless crystals, m 165 **c angelic acid** A monobasic acid, $C_9H_8O_2$ i.e. C_8H_7COOH, derived from cinnamaldehyde **c crotonic acid** A monobasic acid, $C_9H_8O_2$ i.e. C_8H_7COOH, derived from cinnamaldehyde
cinnamic Describing a compound containing the monovalent Ph CH CH— or C_8H_7— radical
cinnamic acid $C_9H_8O_2$ = 148 11 Benzal-acetic acid, beta-phenylacrylic acid, styrylformic acid *trans-* benzenepropenoic acid, PhCH CHCOOH An unsaturated monobasic acid and constituent of balsams and storax Colorless monoclinic scales, d_4° 1 248 m 133, b 300, slightly soluble in water, soluble in alcohol or ether, it is used as a reagent for indole and in the synthesis of many organic compounds It occurs in the trans- and cis- forms **allo-** The cis- form of c **amino-** $NH_2C_9H_7O_2$ = 163 26 **o-** Colorless needles decomp 160, slightly soluble in water, soluble in alcohol or ether **m-** Yellow needles, m 180, slightly soluble in water, soluble in alcohol or ether **p-** Yellow needles, decomp 175, sparingly soluble in water, soluble in alcohol or ether **3 4-dihydroxy-** Caffeic acid **3 4-dioxy-** Caffeic acid **hydro-** $PhCH_2CH_2COOH$ = 150 13 Beta-phenylpropionic acid Colorless needles, d_{49}°1 071, m 48 7, b 379, sparingly soluble in water, soluble in alcohol or ether **hydroxy-** Coumaric and umbellic acids **hydroxy-methoxy-** See *ferulic acid, isoferulinic acid, hesperitinic acid* **methoxy-** $MeOC_9H_7O_2$ = 179 09 **o-2-methoxy-** Colorless crystals, m 182, soluble in alcohol **nitro-** $NO_2C_9H_7O_2$ = 193 11 **o-** White needles, m 249, insoluble in water, slightly soluble in alcohol **m-** Yellow needles, m 196, slightly soluble in water, or alcohol **p-** Colorless prisms, m 285, sparingly soluble in water, soluble in alcohol or ether **oxy-** Coumaric acid
cinnamic alcohol $C_9H_{10}O$ = 134 13 Styryl alcohol, peruvin, styrene, styrolene alcohol styrone styrilic acid, phenyl, glycol, phenylallyl alcohol, *3*-phenyl-*2*-propen-*1*-ol* A monoatomic alcohol from balsam, storax, and cinnamon bark PhCH CHCH$_2$OH White needles, d_{35}° 1 040, m 33, b 250, slightly soluble in water, soluble in alcohol or ether Used in artificial flavors, as a deodorant and antiseptic **hydroxy-methoxy-** Coniferyl alcohol
cinnamic aldehyde Cinnamaldehyde **c anhydride** (PhCH CHCO)$_2$O = 278 2 White crystals m 127, slightly soluble in hot water
cinnamide Cinnamamide **hydro-** Cinnhydramide
cinnamilidene (1) $C_{10}H_{10}$ = 130 1 The unsaturated hydrocarbon PhCH CH CH CH$_2$ (2) Cinnamal **c acetic acid** The monobasic acid PhCH CH CH CH COOH = 174 08 **c malonic acid** The dibasic acid PhCH CH CH C(COOH)$_2$ = 218 08
Cinnamomum A genus of trees, Lauraceae, which yield important drugs, as,

C camphora	camphor, camphor oil
C cassia	cassia bark, cassia oil
C zeylanicum	cinnamon, cinnamon oil

cinnamon The dried inner bark of various *Cinnamomum* species, as, *C zeylanicum* of Ceylon and *C cassia* (q v) of China Used as an aromatic, carminative, astringent and condiment **wild-** Canella **c oil** The essential oil from the bark of various cinnamon species *Cassia-*, from *C cassia*, d 1 045–1 063, b 240–260, contains 70–85 % cinnamaldehyde *Ceylon-*, from *C zeylanicum*, d 1 024–1 040, contains cinnamaldehyde and eugenol *leaf-*, d 1 044–1 065, contains, eugenol, sapol and cinnamaldehyde **c stone** A mineral of the garnet group
cinnamone Styryl ketone
cinnamonitrile C_9H_7N = 129 1 A crystalline compound obtained from cinnamide by the action of P_2O_5
cinnamoyl The monovalent PhCH CHCO— or C_9H_7O— radical
cinnamyl (1) Cinnamoyl (2) The radical Ph CH CH CH$_2$— or C_9H_9— **c acetate** The ester, $CH_3COOC_9H_9$, a constituent of many essential oils **c alcohol** Cinnamic alcohol **c chloride** C_9H_7OCl = 166 51 Chlorcinnamyl, PhCH CHCOCl Colorless crystals, m 36, b 257 **c cinnamate** Styracin **c cocaine** An alkaloid, m 121, from cocoa leaves **c eugenol** $C_8H_7COOC_9H_{11}O$ = 282 14 Eugenol cinnamate An ester of cinnamic acid and eugenol Colorless needles, used as an antiseptic **c guaiacol** Styracol **c hydride** Allylbenzene **c methyl ketone** Benzalacetone **c phenyl ketone** Benzalacetophenone
cinnhydramide $C_{18}H_{16}N_2$ = 260 3 Hydrocinnamide (PhCH CH CH)$_2$N$_2$ Colorless crys-

tals obtained from cinnamaldehyde and ammonia gas Cf *hydrocinnamamide*

cinnitraniside $C_{16}H_{14}O_4N_2$ = 298 13 Nitranisyl cinnamide

cinnoline $C_8H_6N_2$ = 130 2 *α*-phenoi-*1 2*-benzodiazine, *α*-benzo-o-diazine The heterocyclic compound  Colorless crystals, m 390, an isomer of phthalazine, quinazoline and quinoxaline **dihydro-** $C_8H_8N_2$ = 132 2 Colorless crystals, m 88, soluble in alcohol

cinnyl Cinnamyl

cinobufagin $C_{26}H_{32}O_6$ = 428 2 A cardiac poison from Ch'an-Su, the dried venom of the Chinese toad, it hydrolyses to $C_{23}H_{30}O_5$ and acetic acid Cf *cholane derivatives*

circle A ring or a plane figure bounded, by a uniformly curved line Let *r* be the radius, d the diameter and *π* a constant (*3* 14159) then

diameter =	2r
circumference =	$2\pi r$ or πd
area =	πr^2 or $\frac{1}{4}\pi d^2$ or 0 7854d^2

Cf *pi, quadrant*

circonium Zirconium

circuit The continuous path of an electrical current

circular Round **c area** d^2 = 1 2733a or a = 0 785398d^2 where d is the diameter, and a the area **c inch** The area of a circle one inch in diameter = 0 7854 sq in = 507 mm^2 = 5 07 cm^2

circulation A continuous movement in a regular course, as the motion of the blood through the blood vessels, the returning of the distillate to a still, or the movement of heated liquids or gases in a circuit

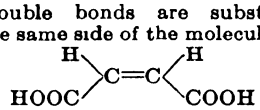
circulatory equalizers A drug which restores the equilibrium of the circulatory system

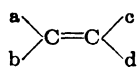
circumference The outline of a more or less circular body Cf *circle*

circumflux Flowing or winding around

circumfusion Pouring or fusing around, as, a lower melting-point flux

circumpolar Around a pole

cis A form of isomerism of organic compounds, in which the H-atoms attached to two carbon atoms with double bonds are substituted adjacently on the same side of the molecule, *e g* , in maleic acid  The relation of cis- and trans-isomerism is

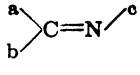


where

a c is the *cis-* position

a d is the *trans-* position,

or in the case of nitrogen compounds



where

a c is the *cis-* position

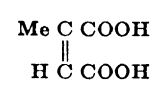
b c is the *trans-* position

cissampeline $C_{18}H_{21}O_3N$ = 299 3 An alkaloid from pareira root, *Cissampelos pareira*, a Menispermaceae of Brazil, a tonic and diuretic Cf *bebeerine, dyamettin, deyamettin*

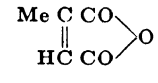
cistus Labdanum

citarin. CH_2 O O CO $C(CH_2COONa)_2$ = 248 05 Sodium anhydro methylene citrate, citramin, goutine A compound which dissolves in acid, used in the treatment of gout

citraconic acid $C_5H_6O_4$ = 130 0 Methyl maleic acid, 1 2-dicarboxypropylene, methyl butene dioic acid* A dibasic acid isomeric with paraconic, itaconic, protaconic, isaconic and mesaconic acids, q v



c anhydride $C_5H_4O_3$ = 112 0 Methylmaleic anhydride An intramolecular anhydride of citraconic acid, an oily, colorless liquid



citraconyl The divalent $C_5H_4O_4$— radical derived from citraconic acid

citral $C_9H_{15}CHO$ = 152 18 *α-* Geranial An aldehyde of several essential oils (citron oil) Me_2C CH CH_2 CH_2 CH CMeCHO It occurs as 4 isomers, as cis- and trans-terpinolene and cis- and trans-limonene A yellowish volatile liquid, d 0 897, b 224 5, insoluble in water, miscible with alcohol or ether, used in perfumery and as a flavoring agent *β-* Neral A colorless liquid, d 0 888, b $_{12mm}$104

citramalic acid $C_5H_8O_5$ = 148 1 *2*-Hydroxy-*2*-methyl butanedioic acid*, HOOC CMeOH - CH_2 COOH A dibasic acid derived from citraconic acid and isomeric with itamalic acid *dl-* Monoclinic prisms, m 119

citramide $C_6H_{11}O_4N_3$ = 189 11 Colorless crystals, m 215 derived from ethyl citrate by the action of ammonia

citramin Citarin

citranilide $C_{24}H_{24}O_4N_3$ = 418 22 A compound obtained by heating aniline and citric acid

citrate A salt containing the trivalent $C_6H_5O_7\equiv$ radical, derived from citric acid **c soluble** The phosphates in a fertilizer which are soluble in ammonium citrate solution

citratus A brand of di-calcium phosphate used as fertilizer

citrene $C_{10}H_{16}$ = 136 2 A terpene of lemon oil and identical with d-limonene, b 168 **c terpin.** $C_{10}H_{20}O_2$ = 172 16 Citrene dihydrate Colorless crystals, formed by the action of water on citrene

citresia Magnesium acid citrate

citric acid $C_6H_8O_7$ H_2O = 210 11 1,2,3-tricarboxy-2-hydroxypropane, *2*-hydroxy-*1,2,3*-propane tricarboxylic acid*, $C_3H_4(OH)(COOH)_3$ - H_2O A tribasic acid found in many fruit juices (lemon, orange, etc) Colorless crystals, $d_{18°}$ 1 542, m 153, decomp on further heating, readily soluble in water or alcohol, slightly soluble in ether Used as a reagent in quantitative and qualitative analysis, and as a constituent of soda-fountain mixtures Cf *citromyces, diconic acid* **phenetidin-** Apolysin

c a cycle Krebs cycle The main sequence of carbohydrate oxidation in the body tissues

It corresponds with the complete oxidation of pyruvate to CO_2 and H_2O in the stages

pyruvate → oxalacetate →
citrate → *iso*citrate →
oxalsuccinate → α-keto-
glutarate → succinate →
formate → malate → oxalacetate,

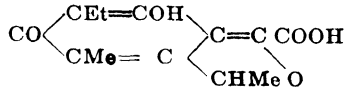
and so on

citridic acid. Aconitic acid

citrin (1) Cucurbo citrin A glucoside from watermelon seeds, used as a hypotensor (2) Hesperidin

citrine (1) A yellow variety of quartz (2) A yellow mercury ointment

citrinin $C_{13}H_{14}O_5$ = 250 05 A lemon yellow pigment from the fungus *Penicillium citrinum*, m 170–171 (decomp)



It inhibits the growth of *Staphylococcus aureus*

citrometer A hydrometer graduated to indicate percentages of citric acid

citromin Citarin

citromyces A mold fungus, *C pfefferianus*, which ferments glucose to citric acid

citromycetin $C_{14}H_{10}O_7\ 2H_2O$ = 308 07 A yellow flavone pigment from the fungus *Citromyces*

citronella Lemongrass **c oil** The essential oil of many *Andropogon* or *Cymbopogon* species (lemongrass) Used for perfuming soap, and to keep off mosquitoes *Batu-* d 0 900–0 920, *Singapore-* d 0 886–0 900 Both contain geraniol and citronellal

citronellal $C_{10}H_{18}O$ = 154 19 An aldehyde in many essential oils, it occurs in two isomers the limonene form, MeC CH(CH$_2$)$_3$CHMeCH$_2$-CHO, and terpinolene form, CH$_2$ CMe(CH$_2$)$_3$-CHMeCH$_2$CHO A colorless liquid, $d_{17°}$ 0 854, b 207, slightly soluble in water, miscible with alcohol or ether, used in perfumery and as a flavoring agent

citronellaldehyde Citronellal

citronellic acid $C_{10}H_{18}O_2$ = 170 14 Colorless liquid, d 0 931, b 257

citronellol $C_{10}H_{20}O$ = 156 21 2 6-dimethyl-octene-1-ol-8 An isomer of rhodinol occurring in two stereoisomeric forms, CH$_2$ CMe(CH$_2$)$_3$-CHMe CH$_2$ CH$_2$OH An unsaturated alcohol and constituent of many essential oils, colorless liquid, d 0 856, b_{17mm} 118, slightly soluble in water, miscible with alcohol or ether

citronin Dinitrodiphenylamine A yellow aniline dye

citronyl Citronella oil

citrophen A compound of citric acid and p-phenetidine, (EtO C$_6$H$_4$ NHCO)$_3$C$_3$H$_4$OH White crystals, m 181, soluble in water or alcohol It is an antipyretic, sedative and antineuralgic

citrulline (1) A resinoid of colocynth A yellow amorphous powder, insoluble in water, soluble in alcohol or ether, used medicinally as a laxative (2) $C_6H_{13}N_3O_3$ = 175 11 An amino acid (q v) from casein and watermelon *Citrullis vulgaris*, m 220, and an intermediate in the formation of urea

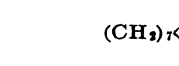
Citrus Aurantiaceae A genus of trees, Rutaceae, whose fruits are edible and yield juice, rinds, oils, and acids

C aurantium	sweet orange
C aurant var *bigarardia*	bitter or Seville orange
C medica	citron
C med var *limonum*	lemon
C med var *acida*	lime
C med var *limetta*	sweet lime
C bergamia	bergamot
C decumana	grape fruit or shaddock
C suntara	kumquat
C nobilis	mandarin

citryl Lemon oil

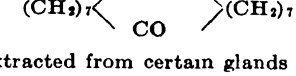
civet A semi-liquid fat of strong musklike odor obtained from the civet cat, *Viverra civetta*, of the East Indies It contains an essential oil and ammonia Formerly used medicinally as an antispasmodic, now used as a perfume

civetane $C_{17}H_{32}$ = 236 2 Cycloheptadecene,



A colorless crystalline substance, m 47, b 120

civetone $C_{17}H_{30}O$ = 250 3 Δ^9-cycloheptadecenone, 9-cycloheptadecen-1-one* The seventeen-membered ring ketone



It is extracted from certain glands of the civet cat

C K wax See *wax*

Cl The symbol for chlorine, Cl^- chloride ion, **Cl*** excited chlorine atom, Cl_2 chlorine molecule, Cl_2^+ ionized chlorine molecule, Cl_2* excited chlorine molecule

cl An abbreviation for centiliter = $\frac{1}{100}$ liter = 10 cc

cladding A thin veneer of metal (usually nickel) used to protect steel plate from corrosion

cladonic acid An acid obtained from *Cladonia rangiferina*, a lichen (reindeer moss)

cladothrix A quasi-branched form of schizomycetes **c ochracea** A c which oxidizes ferrous salts to ferric hydroxide and is the cause of the brown deposits in certain springs

Claisen, Ludwig 1851–1930 A German chemist, noted for work on tautomerism **C. condensation** Claisen reaction **C flask** A distillation flask with a U-shaped and tubulated neck **C reaction** A synthetic reaction of an aldehyde with an aldehyde or ketone in the presence of NaOH or NaOEt, according to the general equation R CHO + CH$_3$ CO R′ ⇌ R CH CH CO R′ + H_2O

clamp A device by which an instrument is held in position or by which the flow of a gas or liquid is interrupted

Clapeyron Benoit-Paul Emile 1799–1864 A French engineer **C equation** An equation for calculating the change in the boiling point of a liquid at different pressures dp/dT = λ/T(v_2 − v_1) where p = pressure, T = absolute temperature, λ = heat of vaporizing 1 gm of liquid, v_2 = specific volume of vapor, v_1 = specific volume of liquid Cf *Clausius equation*

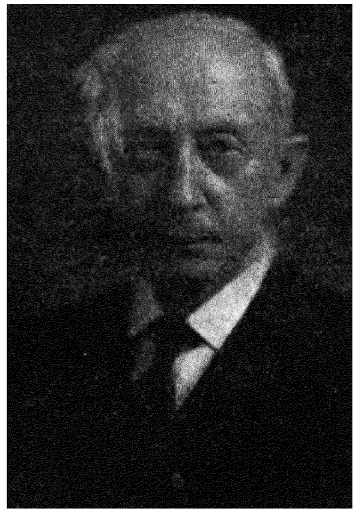
clarain A constituent of coal (q v)

clarificant A substance for clearing a solution

clarification. A process by which a liquid is clarified, *e g*, filtration, sedimentation, precipitation with inert colloidal substances, etc Cf *defecation*

Clark cell. A standard voltaic cell giving 1.433 volts at 15°C, but affected greatly by temperature changes. It consists of an anode of mercury and a cathode of amalgamated zinc in a saturated solution of zinc sulfate. **C. degree.** See *hardness* (wtr).

Clarke, Frank Wigglesworth. 1847–1931. An American chemist, noted for geochemical research.



Frank Wigglesworth Clarke.

Classen, Alexander. 1843– . A German chemist noted for analytical methods. **C. platinum dish.** A platinum dish for electrolytic separations. **C. switch board.** A switch board and work table for quantitative electrolysis.

Classification of compounds. See *compounds, chemicals, organic compounds, Mulliken classification, ring systems, types.* **-of drugs.** See *drug.* **-of elements.** See *periodic system.* **-of reactions.** See *reactions.*

Claude, Georges. A French inventor, noted for liquefaction methods and neon lamps. **C.'s method.** A modification of the Linde process for liquefying air. The air is liquefied in stages by passage through an orifice under pressure, and the expanding gas cooled by doing work externally in a piston-engine. Cf. *nitrogen fixation.*

Claudetite. A native arsenious oxide.

Claus, Adolf. 1840– . A German chemist noted for his benzene formula and system of organic chemistry.

Clausius, Rudolf Julius. 1822–1888. A German physicist, and founder of the mechanical theory of heat. **C. equation.** Clausius-Clapeyron equation. An equation for calculating the vapor pressure and the heat of vaporization: $\log P = -L/4.58T + C$ where P is the vapor pressure at the absolute temperature T, and L the molecular heat of vaporization, while C is a constant of integration. Its integrated form is

$$2.303 \log \frac{P}{760} = \frac{L}{R}\left(\frac{1}{T_{760}} - \frac{1}{T_p}\right)$$

where T_{760} and T_p are the boiling points at 760 and p mm. pressure respectively, R is 1.985 gm. cal. See also *Clapeyron equation.* **C. law.** The specific heat of a gas is independent of temperature, provided the gas is kept at constant volume. **C.- Mosotti equation.** The polarization of the dielectric per mole is related to the dielectric constant, D, by $\frac{D-1}{D+2} \cdot \frac{m}{d} = P$, where m is the molecular weight, d the density and P the molal polarization.

clausthalite. PbSe. A native lead selenide from Klausthal, Czechoslovakia.

clavicepsin. $C_{18}H_{34}O_{16} = 506.26$. An inert glucoside, m.198, found in ergot.

clavine. $C_{11}H_{22}O_4N_2 = 246.18$. An alkaloid of ergot, m.263.

clay. A plastic, soft, variously colored earth, a hydrous silicate of alumina ($H_4Al_2Si_2O_9$) formed by the decomposition of feldspar and other aluminum minerals. In true clay 30 % of the total weight of solid particles consists of particles of diameter less than 0.002 mm. Used for pottery, filter candles, etc. Cf. *ceramics.* **China-** See *china clay.* **fire-** q.v. **pipe-** q.v. **potters'-** q.v. **c. ironstone.** Siderite.

clean. Describing a surface free from foreign matter; as, a metal free from scales or oxide, a glass free from oil or chemicals.

cleaning compounds. A mixture of substances such as soda, borax, sodium peroxide, etc., used for cleaning and washing materials (furniture, carpets, wood, etc.). **c. solution.** Mixed concentrated sulfuric acid and sodium dichromate, used to clean chemical glassware.

clearing. (1) The clarification of a solution. (2) In the dye industry, to free the cotton fiber from grease by boiling in a weak solution of sodium carbonate. (3) In photography, the removal of fog from a plate.

cleavage. (1) The separation of layers or parts from a mass, *e.g.*, the splitting of crystals in certain directions. (2) In biology: segmentation. Cf. *amitosis.*

clebrium. A non-corrosive alloy of iron with 13–19 % Cr, 2–4 % Ni, 3.2–0 % Mo, 0–2 % C, 0.8–2.8 % Mn.

clematidin. $C_9H_{10}O_4 = 214.08$. A compound derived from *Aristolochia clematitis*, birthwort, an Aristolochiaceae.

clematine. An alkaloid from *Clematis vitalba*, a Ranunculaceae.

Clematis. A genus of climbing, ranunculaceous plants.

Clerget inversion. The determination of sucrose polarimetrically after inversion of 100 cc. of solution with 5 cc. of strong HCl at 69° for 7½ mins. Sucrose $= \frac{100(a-b)}{142.66 - t/2}$ where a and b are the polarisations originally and after inversion at t°C.

Clerici solution. A molar mixture of thallium malonate and thallium formate, d.4.27; used in mineralogy to float specimens for determining their density.

Cleve, Per T. 1840–1905. A Swedish chemist noted as co-discoverer of helium and rare earth metals. **C.'s acid.** *1*-Naphthylamine-6-sulfonic acid.

Cleveland tester. An apparatus for determining the flash point of illuminating oil.

climacteric. A stage in the ripening of fruit.

clinical analysis. The examination of body fluids and waste products for diagnostic purposes. **c. tests.** The reactions employed in the

examination of urine, feces, stomach contents, blood, etc , for diagnostic purposes

clinker Hard, more or less vitrified fused residue remaining after combustion of coal in a furnace or kiln It is also a product of volcanoes and is used in the manufacture of cement Cf *slag*

clinochlore Ripidolite A green chlorite or aluminum magnesium silicate, d 2 65–2 78

clinometer A device for measuring slopes or inclines

clinostat A moving disk apparatus for determining the phototropism of a plant

closed chain A ring compound see *chain*

clot A solid concretion of a soft jelly-like mass **blood-** See *blood*

cloth Any fabric woven of wool, cotton, linen, silk or other fiber **cheese-** A loosely woven thin cotton cloth used for straining **filter-** A stout linen cloth or canvas used in filter presses

clotting The coagulation of blood, lymph, or milk

cloud point The temperature at which a solid substance starts to precipitate from solution in an oil when this is cooled under standard conditions Cf *aniline point*

cloudy (1) Containing a diffused and adhering precipitate (2) Describing a bacterial culture which does not contain pseudozoogleae

clove(s) Caryophyllus The dried flower buds of *Caryophyllus aromaticus*, a Myrtaceae, used as spice **c oil** Essential oil of cloves A colorless or slightly yellow, volatile liquid, d 1 079, b 243, which consists of eugenol and several hydrocarbons

clovene $C_{15}H_{24}$ = 204 19 A terpene from clove oil A colorless liquid, d 0 93, b 263

cloves Caryophyllum

clupanodonic acid $C_{22}H_{34}O_2$ = 330 27 Docosa-*4,7,11*-trien-*18*-ynoic acid An unsaturated fatty acid in the fat of fish blubber A yellow oil, d 0 9410, m −78, b_{5mm} 236, soluble in ether, iodine number 367 7

clupein A protein from herring, *Clupea harengus*, and containing 47 93 % C, 7 59 % H, 12 78 % O, 31 68 % N

clymocol A brand of mono-chloromethyl-i-propyl phenol, used as a germicide

cm centimeter **cm²** square centimeter **cm³** cubic centimeter = cc

cnicin $C_{42}H_{56}O_{18}$ = 800 5 A glucoside from Canada thistle, *Cnicus arvenis*, or *Carduus benedicta*, a Compositae White, odorless crystals, sparingly soluble in cold water, soluble in hot water

Co The symbol for cobalt

coacervation The reversible collection of emulsoid particles into liquid droplets preceding flocculation

coagel The gel formed during coagulation, coarser in texture than the gels formed by swelling of solid colloids

coagulability The capacity to clot together or curdle

coagulase An enzyme (q v) that curdles and precipitates proteins

coagulation The precipitation of proteins or colloids in a jelly-like, soft mass, it may be caused either by heat, chemical agents or enzymes

coagulator An incubator for keeping test-tubes at blood temperature

coagulen A lipoid obtained by fractionally centrifuging blood, and said to consist mainly of blood platelets A brownish red powder, soluble in water, and rich in thrombokinase Used in surgery to stop bleeding by coagulating the blood

coagulometer A device for determining the speed of coagulation of blood

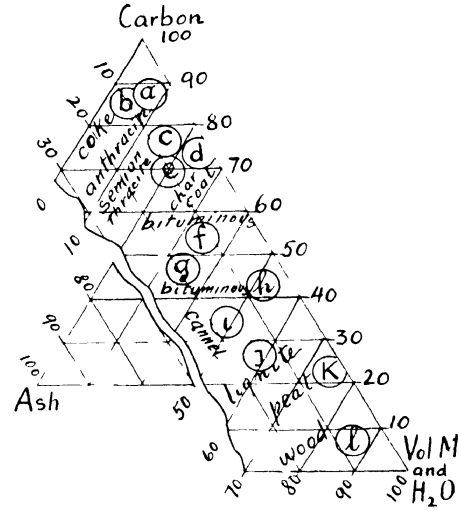
coal A native, black or brownish, brittle or soft substance consisting chiefly of carbon, but also of hydrogen, nitrogen, oxygen and other elements (Si, P, As, Fe, etc) It is the result of the degradation of ancient forests Coals are classified according to their state of mineralization, and consequent percentage of carbon, as *lignites*, *bituminous coal*, and *anthracites* According to Stopes, c is classified microscopically as

1 *clarain*, a mixture of leaves, wood, resinous bodies, etc in a structureless matrix It is lustrous in appearance

2 *vitrain* Lustrous thin bands which break with conchoidal fracture and are derived from wood in which the structure is completely destroyed

3 *durain*, a dull variety of coal, which contains the exines, microspores and megaspheres, and has a high ash

4 *fusain*, thin bands of soft dull coal derived from wood and containing no volatile matter, but having a marked structure



Coal
Three component system (Carbon-volatile matter-ash)

Coals are classified by their carbon content, moisture and volatile matter, and mineral or ash content Coals richest in carbon are the anthracites and cokes, typical compositions of which are shown in area a and b

a	anthracite	13,350 B t u per pound
b	coke	12,000 B t u per pound
c	semianthracite	13,370 B t u per pound
d	charcoal	13,000 B t u per pound
e	bituminous A	14,260 B t u per pound
f	bituminous B	13,900 B t u per pound
g	bituminous C	11,700 B t u per pound
h	bituminous D	9,700 B t u per pound
i	cannel	13,700 B t u per pound
j	lignite	6,000 B t u per pound
k	peat	1,900 B t u per pound
l	wood	7,600 B t u per pound

The world output in 1940 was 1,420,000 tons, coming chiefly from Germany > U S > U K > U S S R

brown- Lignite **cannel-** A compact, hard coal, suitable for gas production **char-** See *charcoal* **hard-** Anthracite **mother of-** Fusain **soft-** Bituminous **c white-** Water power

c brass Marcasite **c gas** The gaseous product of the distillation of coal The average composition is

hydrogen	43–55 %	Non-illuminating but heating
methane	25–45 %	
carbon monoxide	4–11 %	
olefines, acetylenes and benzene	2– 5 %	Illuminants
nitrogen	2–12 %	Impurities
carbon dioxide	0– 3 %	
oxygen	0–1 5 %	

c oil (1) Kerosene (2) Petroleum **c tar** The condensed liquid from the distillation of coal It varies according to the coal and process employed

1 hydrocarbons—benzene, toluene, xylene, naphthalene, anthracene
2 phenols—phenol, cresol
3 basic substances—pyridine, quinoline
4 finely-divided, free carbon

coarse metal An impure, fusible silicate of iron produced in the reverberatory furnace

coating A method for covering materials with protecting substances, as, electroplating, varnishing, painting, waterproofing, fireproofing, etc

coazervate The coagulated or precipitated liquid which separates from an emulsion

coazervation The separation of a lyophylic colloidal system into two liquid phases Cf *coagulation*

cobalt Co = 58 94 An element of the iron group, atomic number 27, discovered in 1733 by G Brandt A steel-gray, slightly pinkish, ductile metal, d 8 718, m 1465, insoluble in water, dissolved by acids It occurs as metal in meteorites, as sulfide and arsenide in smaltite and cobaltite It is prepared by reduction of its oxides in a current of hydrogen Cobalt is bi- and tri-valent and forms two series of compounds

2 cobaltous	Co^{++}
3 cobaltic	Co^{+++}

It forms many double salts, all colored Some of its complex ions are

cobaltous hexahydrate	$Co(H_2O)_6^{++}$
cobaltous hexammonate	$Co(NH_3)_6^{++}$
cobaltous hexacyanide (cobaltocyanide)	$Co(CN)_6^{----}$
cobaltic hexahydrate	$Co(H_2O)_6^{+++}$
cobaltic hexammonate	$Co(NH_3)_6^{+++}$
cobaltic tetracyanide	$Co(CN)_4^-$
cobaltic hexanitrite	$Co(NO_2)_6^{---}$
cobaltic hexacyanide (cobalticyanide)	$Co(CN)_6^{---}$

The cobaltous compounds are the more stable, and are pink when hydrated, and greenish when anhydrous Metallic cobalt is used in alloys, (*e g* , carboloy, stellite) and in ceramics **black-** An earthy variety of native **c earthy-** Asbolite **red-** Erythrite **speiss-** An impure smaltite

c acetate. Cobaltous acetate **c acetylide** The compound C_2Co **c aluminate** Thenard's blue **c bloom.** The mineral $Co_3(AsO_4)_2$, $8H_2O$ **c blue** A dark blue mineral pigment containing 35 % CoO, 20 % ZnO and 25 % SiO_2 **c carbonyl** C tetracarbonyl **c chlorides** See *cobaltichloride*, *cobaltic* and *cobaltous chloride* **c cyanide** Cobalticyanide **c green** Cobalt zincate, Rinman's green A solid solution of cobaltous oxide and zinc oxide used as green pigment **c minerals** Cobalt is usually associated with nickel and found as sulfide, or arsenide

native cobalt	Co
jaipurite	CoS
linnaeite	Co_3S_4
smaltite	$CoAs_2$
safflorite	$CoAs_2$
skutterudite	$CoAs_3$
erythrite	$Co_3As_2O_8$
cobaltite	CoAsS
carrollite	Co_2CuS_4
bieberite	$CoSO_4\,7H_2O$
asbolite	$CoCl(OH)_2$
spherocobaltite	$CoCO_3$

c nitride Co_2N = 132 0 A black crystalline substance **c nitrites** Cobaltinitrite **c oxides** CoO = cobaltous oxide, Co_2O_3 = cobaltic oxide, Co_3O_4 = cobalto-cobaltic oxide The cobalt oxide used in ceramics and the glass industry as a blue pigment for enamels, vases, porcelain, etc , is variable in composition **c phosphide** Co_2P = 149 0 A black, metallic substance **c sulfates** See *cobaltic sulfate* and *cobaltous sulfate* **c tetracarbonyl** $Co(CO)_4$ = 171 0 C carbonyl Black crystals, $d_{18°}$ 1 827, m 43, b 135 (decomp), insoluble in water, soluble in alcohol, ether or carbon disulfide **c yellow** Cobaltic potassium nitrite **c zincate** C green

cobaltammine compounds Ammonate A group of compounds of ammonia and cobalt containing the ammonia molecules in combination Luteocobaltichloride $[Co(NH_3)_6]Cl_3$, purpureo-cobalt chloride $[Co(NH_3)_5Cl]Cl_2$, roseo-cobaltichloride $[Co(NH_3)_5H_2O]Cl_3$ See *cobaltichloride*

cobaltic Containing trivalent cobalt ≡ Co **c chloride** $CoCl_3$ = 165 4 Blue crystals, d 2 94, decomp on heating, soluble in water See *cobaltichloride* **c hydroxide** $Co(OH)_3$ = 110 0 A black powder, insoluble in water, soluble in acids **c oxide** Co_2O_3 = 166 0 Cobalt sesquioxide, a brownish-black powder, d 5 18, decomp at red heat, is insoluble in water, soluble in acids **c potassium cyanide** Potassium cobalticyanide **c potassium nitrite** $K_3Co(NO_2)_6\,xH_2O$ Potassium cobaltinitrite, cobalt yellow, or potassium cobaltic hexanitrite A yellow crystalline precipitate obtained by adding potassium nitrite to cobaltic nitrate acidified with acetic acid **c sulfate** $Co_2(SO_4)_3$ = 406 2 A blue crystalline powder, decomp in water, soluble in dilute sulfuric acid **c sulfide** Co_2S_3 = 214 0 A black powder, insoluble in water

cobaltichloride

luteo- $\left[\begin{matrix}NH_3 & & NH_3\\ NH_3 & Co & NH_3\\ NH_3 & & NH_3\end{matrix}\right]Cl_3$ Hexammine cobaltichloride Orange-yellow crystals, soluble in water Reagent for pyrophosphoric acid

praseo- $\left[\begin{matrix}NH_3 & & NH_3\\ NH_3 & Co & NH_3\end{matrix}\right]Cl_3$ Tetrammine cobaltichloride Green crystals, soluble in water

purpureo- $\begin{bmatrix} NH_3 & & Cl \\ NH_3 & Co & NH_3 \\ NH_3 & & NH_3 \end{bmatrix} Cl_2$ Chloropentammine cobaltichloride Purple crystals, soluble in water

roseo- $\begin{bmatrix} NH_3 & & H_2O \\ NH_3 & Co & NH_3 \\ NH_3 & & NH_3 \end{bmatrix} Cl_3$ Aquapentammine cobaltichloride Small red crystals, readily decomp by and soluble in water

cobalticyanic acid $H_3Co(CN)_6 = 216\ 1$ Colorless needles, decomp above 100, very soluble in water or alcohol

cobalticyanide The salts of cobalticyanic acid which contain the trivalent ion $Co(CN)_6^{---}$ This imparts a yellow color to the aqueous solution *E g*, potassium cobalticyanide

cobaltinitrite The salts containing the trivalent complex ion $Co(NO_2)_6^{---}$, imparting a yellow color to the aqueous solution *E g*, potassium cobaltinitrite

cobaltite The mineral (CoFe)SAs

cobalto cobaltic oxide $Co_3O_4 = 240\ 9$ Black, regular crystals, d 5 8–6 3, insoluble in water, soluble in acids

cobalto sulfate A salt containing the divalent $Co(SO_4)_2^{--}$ ion which imparts a red color to the aqueous solution, *e g*, potassium cobalto sulfate, $K_2Co(SO_4)_2$

cobaltous Containing divalent cobalt, Co^{++}

c acetate $Co(C_2H_3O_2)_2\ 4H_2O = 249\ 1$ Purple crystals, $d_{18°}$ 1 7043, soluble in water or alcohol, used in invisible inks

c ammonium sulfate $Co(SO_4)_2(NH_4)_2SO_4\ 6H_2O = 491\ 29$ Red crystals, soluble in water

c arsenate $Co_3(AsO_4)_2\ 8H_2O = 599\ 1$ Erythrite, cobalt bloom Purple or reddish, monoclinic crystals d 2 948, insoluble in water, soluble in acids Used as a light blue pigment for porcelain and glass

c benzoate $Co(C_6H_5COO)_2\ 4H_2O = 373\ 08$ Grayish-red leaflets, dehydrated at 115, soluble in water

c bromate $Co(BrO_3)_2\ 6H_2O = 423\ 0$ A red crystalline substance, is soluble in water

c bromide $CoBr_2\ 6H_2O = 326\ 9$ Red hygroscopic crystals, soluble in water or alcohol, used for filling hygrometers

c butyrate $Co(C_4H_7O_2)_2 = 233\ 2$ A purplish-red, granular powder, soluble in water

c carbonate $CoCO_3 = 119\ 0$ A rhombohedric, rose-colored, light powder, d 4 13, decomp on heating, insoluble in water, soluble in acids Used for the preparation of cobalt, oxides and cobalt pigments

c chlorate $Co(ClO_3)_2\ 6H_2O = 334\ 0$ Purple, regular crystals, d 1 84, m 50°C, decomp 100, very soluble in water or alcohol

c chloride $CoCl_2 = 129\ 9$ Blue crystals, d 2 94, sublime on heating, very soluble in water or alcohol It crystallizes also as hexahydrate, $CoCl_2\ 6H_2O$, tetrammonate, $CoCl_2\ 4NH_3$, pentammonate, $CoCl_2\ 5NH_3$ (cryst) $CoCl_2\ 6H_2O = 238\ 0$ Ruby-red, monoclinic crystals, d 184, m 87, anhydrous at 110°C, very soluble in water or alcohol Used in hygrometers, invisible inks, chemical barometers, and electroplating

c chromate $CoCrO_4 = 174\ 9$ A brown powder containing some cobaltous hydroxide, insoluble in water, soluble in dilute chromic acid

c citrate. $Co_3(C_6H_5O_7)_2 = 555\ 2$ A pink amorphous powder, sparingly soluble in water

c cyanide $Co(CN)_2$, and $Co(CN)_2\ 3H_2O = 165\ 1$ A pinkish-gray or red powder, anhydrous at 250°C, decomp 300, insoluble in water, soluble in potassium cyanide solution

c fluosilicate $CoSiF_6\ 6H_2O = 309\ 09$ Trigonal pink crystals, d 2 067, soluble in hot water

c formate $Co(OOCH)_2 = 149\ 0$ Red crystals, d 2 129, soluble in water

c hydroxide $Co(OH)_2 = 93\ 0$ Rose-red, rhombic or monoclinic crystals or powder, $d_{15°}$ 3 597, insoluble in water, soluble in acids or ammonium salt solutions

c iodide $CoI_2\text{-}6H_2O = 420\ 83$ Brownish-red crystals, soluble in water or alcohol Used similarly to c bromide and chloride

c linoleate $Co(C_{18}H_{31}O_2)_2 = 617\ 42$ Brown amorphous powder, insoluble in water

c nickelous sulfate $NiSO_4\ CoSO_4 = 309\ 72$ A double salt of cobaltous and nickelous sulfates

c nitrate $Co(NO_3)_2\ 6H_2O = 291\ 1$ Red monoclinic crystals, $d_{14°}$ 1 83, m 56, decomp at red heat, very soluble in water or alcohol It is an antidote for cyanide poisoning, used for the preparation of cobalt pigments or secret ink, and as a reagent in blow-pipe analysis

c oleate $Co(C_{17}H_{33}COO)_2 = 621\ 4$ Brown, soft masses, insoluble in water, soluble in oils

c oxalate $Co(OOC)_2\ H_2O = 165\ 0$ A pale-pinkish powder, d 2 325, insoluble in water

c oxide $CoO = 75\ 0$ A brown powder, d 5 68, decomp 2850, insoluble in water or alcohol, soluble in acids or ammonium hydroxide

c phosphate. $Co_3(PO_4)_2\ 2H_2O = 403\ 3$ A red powder, insoluble in water, soluble in phosphoric acid, used for cobalt pigments, in the ceramics and glass industry for light-blue, metallic colors

c propionate $Co(C_3H_5O_2)_2\ 3H_2O = 259\ 06$ Dark red crystals, m *ca* 250, soluble in water

c silicate $Co_2SiO_4 = 209\ 8$ Purple crystals, d 4 63, insoluble in water, decomp by hydrochloric acid

c sulfate $CoSO_4\ 7H_2O = 281\ 2$ Rose vitriol Cf *bieberite* Red, rhombic crystals, $d_{15°}$ 1 918, m 96 8, anhydrous at 450, soluble in water, or alcohol Used technically in the preparation of cobalt salts and cobalt oxides for ceramic pigments, and in galvanostegy for cobalting metals

c stannate $CoSnO_3$ A blue pigment Cf *ceruleum*

c sulfide $CoS = 91\ 0$ A brown powder, $d_{18°}$ 5 45, m 1100, insoluble in water, soluble in acids

c tartrate $Co(C_4H_6O_6) = 212\ 0$ A pink powder, very sparingly soluble in water

cobefrin $C_9H_{13}NO_3 = 183\ 1$ *3 4*-Dihydroxyaminopropanol benzene, corbasil $(OH)_2C_6H_3\text{-}CHOH\ CHMe\ NH_2$ White crystals, used as vasoconstrictor, q v

cobra A poisonous snake of India, *Najatripudians*, whose venom contains ophiotoxin and copralysin

c lecithid A hemolytic compound of lecithin and cobra toxin formed in the blood

cobralysin The hemolytic substance of cobra venom

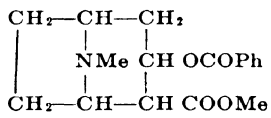
cobric acid A white micro-crystalline powder obtained from cobra venom, and containing calcium sulfate

coca Erythroxylum The dried leaves of the S American shrub *Erythroxylum coca*, used to prepare a stimulant, and as a source of cocaine

c alkaloids A group of related alkaloids, as

cocaine	$C_{17}H_{21}NO_4$
cocainidine	$C_{18}H_{23}NO_4$
tropacocaine	$C_{15}H_{19}NO_2$
hygrine	$C_8H_{15}NO$
nirvanine	$C_{14}H_{20}N_2O_4$
cuscohygrine	$C_{13}H_{24}N_2O$
ecgonine	$C_9H_{15}NO_3$

ıcaine $C_{17}H_{21}O_4N$ = 303 26 Erythroxyline, methylbenzoylecgonine



An alkaloid from the leaves of *Erythroxylum coca* White monoclinic scales, m 98, slightly soluble in water, soluble in alcohol or ether It is a local anesthetic and cerebrospinal stimulant, used chiefly as the hydrochloride Cf *cocethyline, novocaine, tutocaine, psicaine*

ısatropyl- See *ısatropylcocaine* **methyl-** Cocaınidine **tropa-** See *tropacocaine*

c benzoate $C_{17}H_{21}O_4N\ C_7H_6O_2$ White, soft, crystalline mass, soluble in water or alcohol **c bıtartrate, d-ψ-** Psicaine **c borate** A white, crystalline powder, soluble in alcohol, used for eye washes and hypodermically **c chloride** C hydrochloride **c cıtrate** $(C_{17}H_{21}O_4N)_2$-$C_6H_8O_7$ = 798 58 White crystals, soluble in water, used in dentistry as an anesthetic **c hydrobromide** $C_{17}H_{21}O_4N$ HBr = 384 19 White crystals, soluble in water **c hydrochloride** $C_{17}H_{21}O_4N$ HCl = 339 73 Colorless prisms or scales, m 186, slightly soluble in water, soluble in alcohol, insoluble in ether or chloroform, used medicinally as local and general anesthetic, stimulant, anodyne, antipruritic, and sedative **c hydroıodide** $C_{17}H_{21}O_4$-N HI = 431 19 Yellow crystals, sparingly soluble in water or alcohol **c lactate** $C_{17}H_{21}$-$O_4N\ C_3H_6O_3$ = 393 31 A soft, syrupy mass soluble in water or alcohol, used as an anesthetic, sedative and antiseptic **c nitrate** $C_{17}H_{21}$-$O_4N\ HNO_3$ = 366 28 White crystals, soluble in water **c oleate** A solution of cocaine in oleic acid, used externally **c salicylate** $C_{17}H_{21}O_4N\ C_7H_6O_3$ = 441 31 Colorless crystals, soluble in water or alcohol **c sulfate** $C_{17}H_{21}O_4N\ H_2SO_4$ = 401 35 A granular, white, crystalline powder, soluble in water or alcohol **c tannate** $C_{17}H_{21}O_4N\ C_{14}$-$H_{10}O_9$ = 625 4 A white, amorphous powder, soluble in alcohol **c tartrate** $(C_{17}H_{21}O_4N)_2$-$C_4H_6O_6$ = 756 57 Colorless crystals, soluble in water or alcohol

ıcaınidine $C_{18}H_{23}O_4N$ = 317 3 Methylcocaine An alkaloid from coca leaves, similar to cocaine

catannic acid $C_{17}H_{22}O_{10}\ 2H_2O$(?) A tannic acid from the leaves of *Erythroxylum coca,* yellow micro-crystals

ıccaceae A family of spherical schizomycetes (bacteria), which includes coccus, diplococcus, staphylococcus and streptococcus

ccalinic acid Menispermic acid

cceric acid $C_{32}H_{64}O_3$ = 496 49 The monobasic, fatty acid, $C_{31}H_{62}(OH)COOH$, derived from cochineal wax White crystalline mass, m 92 5

ccerin $C_{30}H_{60}(C_{31}H_{61}O_3)_2$ = 1382 11 A wax derived from cochineal, soluble in benzene

cceryl The divalent $C_{30}H_{60}$= radical derived from c alcohol **c alcohol** $C_{30}H_{62}O_2$ = 454 6 A dibasic alcohol from cochineal wax, white crystals, m 101–104

ccerylic acid Cocceric acid

cci The plural of coccus

ıccidium. A genus of sporozoa

ccinellin Carmine

coccinic acid $C_9H_8O_5$ = 196 06 Hydroxymethylphthalic acid, HO $C_6H_2Me(COOH)_2$ An acid derived from euxanthic acid Cf *cocınic acid*

coccognic acid Coccognidic acid An acid substance from *Daphne gnidium,* a Thymelaeaceae

coccognidic acid Coccognic acid

coccognin A glucoside from the fruits of *Daphne gnidium,* a Thymelaceae

coccolith The minute calcareous skeleton of floating marine algae

coccon The seeds of the pomegranate

cocculin $C_{19}H_{26}O_{10}$ = 414 3 A crystalline constituent of *Cocculus indicus,* fishberry, it is a narcotic Cf *kukoline*

cocculus The fruit of menispermaceous plants **c indicus** Fishberry, Indian berry, Oriental berry, Levant berry The dried fruit of *Anamirta paniculata,* a Menispermaceae and climbing shrub of the East Indies, used as a destroyer of vermin and lice See *cocculin, anamirtin picrotoxin, kukoline*

coccus (1) A round or spherical bacterium (2) A species of insects of the family Coccidae, scale insects, that yield cochineal, Chinese wax, kermes, lac, manna

cocethyline $C_{18}H_{23}O_4N$ = 317 5 Ethylbenzoylecgonine A homolog of cocaine Colorless crystals, m 109, soluble in alcohol or ether Used as local anesthetic and cocaine substitute

cochineal The dried, female insect, *Coccus cacti,* which is reared on several species of cactus (*Opuntia*) and exported from tropical America Its chief constituent is carmine, and it is used for coloring pharmaceutical preparations, and as an indicator **c solution** A test solution and indicator prepared by macerating 3 gm of unbroken cochineal for four days in 250 cc of a mixture of 1 pt alcohol and 3 pts water Used as an indicator in determining alkali carbonates, alkaloids, and inorganic acids, but is useless for organic acids (alkalis = violet, acids = yellowish-red) **c wax** Coccerin

cochinilin Carminic acid

cochlear, cochleare A spoon It is used, sometimes, as a pharmaceutical measurement cochlear magnum (tablespoon) = 15 cc = ½ fluid ounce, cochlear medium (dessertspoon) = 8 cc = 2 fluid drachms, cochlear parvum (teaspoon) = 4 cc = 1 fluid drachm

Cochlearia (1) A genus of cruciferous plants (2) Scurvy-grass The dried herb of *C officinalis,* used as a stimulant, diuretic and antiscorbutic in form of a fluid extract (3) *C armoracia,* horse radish (q v)

cochrome An alloy of Co and Cr, analogous to nichrome (q v)

cocinic acid $C_{11}H_{22}O_2$ = 186 17 A fatty acid from cocoanut oil, (cf *coccinic acid, umbellulic acid, undecylic acid*)

cocinin An ester of cocinic acid, the chief constituent of cocoanut oil

cocinone $C_{21}H_{42}O$ = 310 0 A derivative of cocinin

coclaurine An alkaloid from the leaves and bark of *Cocculus laurifolius,* a Menispermaceae

cocoa Cacao, (q v) Cf *coca, coconut* (1) C tree The shrub *Theobroma cacao,* a Sterculiaceae of the tropics (2) C seeds (3) A brownish-red powder consisting of the finely ground residue of the seeds of *Theobroma cacao,* after expression of their fat (4) The beverage made from (3) (5) Cf *coca, coconut* **c butter** Cacao butter, oleum theobromatis, theobroma

oil A yellow or brownish fat obtained by compression of cacao seeds between hot or cold plates, d 0 976–0 995, sapon val 192–200, iodine val 32–37 7, m 30–35°C, soluble in ether or chloroform **c nut** (1) Cocoa (2) Coconut Cf *coca* **c nut oil** See *coconut oil* **c oil** Cocoa butter **c red** $C_{17}H_{12}(OH)_{10}$ The pigment of c , 2 5–5 % of which is formed during the drying of the white beans by enzyme action **c seeds** Cacao The dried and fermented seeds of the cocoa tree, *Theobroma cacao*, of tropical and South America, used to make a beverage Chemical composition (approximate)

Fat (cocoa butter)	50 0 %
Albumin	18 0 %
Starch	10 0 %
Gum	8 0 %
Water	6 0 %
Salts (ash)	3 6 %
Coloring matter	2 6 %
Alkaloids (theobromine)	1 5 %

c shell meal The ground husks of c seeds, used as fertilizer They contain 2 5 % N, 1 % P_2O_5 and 2 5 % K_2O

coconut Cocoanut The fruit of *Cocos nucifera*, a palm of the Pacific and Australian Islands and the East and West Indies Cf *copra, coir* **c butter** Coconut oil **c cake** The compressed material remaining after the expression of c oil **c oil** A fixed oil expressed from the fruit of *Cocos nucifera* or copra (dried cocoanut) Used in large quantities in the manufacture of margarine, food products and soap A yellow oil, d 0 9259, m 14 Sapon val 246–268, iodine no 8–9 5, acid val 5–50

cod The cod fish, *Gadus morrhua* **c ichthulin** A vitellin from cod eggs **c liver oil** See *codliver oil*

codamine $C_{20}H_{25}O_4N$ = 343 20 An alkaloid of opium, isomeric with laudanine, m 121

codeic acid An acid derived from codeine

codeine $C_{18}H_{21}O_3N\ H_2O$ = 317 28 Methyl-morphine, morphine methyl-ether A levo-rotatory alkaloid derived from opium, in which it occurs to the extent of 0 2–0 8 % Colorless orthorhombic crystals, anhyd 155, slightly soluble in water, soluble in alcohol or ether Used as a mild narcotic instead of morphine Cf *codeinone, codethyline, dicodeine* **c citrate** $(C_{18}H_{21}O_3N)_3C_6H_8O_7$ = 1089 84 Colorless crystals, soluble in water, or alcohol **c hydrobromide** $C_{18}H_{21}O_3N$-HBr $2H_2O$ = 434 24 Colorless crystals, soluble in water, used medicinally for whooping cough **c hydrochloride** $C_{18}H_{21}O_3N$ HCl $2H_2O$ = 371 77 White needles, anhydrous at 164, m 264, soluble in water **c methyl bromide** Eucodeine **c phosphate** $C_{18}H_{21}O_3N\ H_3PO_4$-$2H_2O$ = 433 32 White crystals, anhydrous at 235, soluble in water, sparingly soluble in alcohol or ether, used hypodermically as a sedative **c salicylate** $C_{18}H_{21}O_3N\ C_7H_6O_3$ = 455 31 Colorless, crystalline powder, soluble in water or alcohol, used medicinally in rheumatic disorders **c sulfate** $(C_{18}H_{21}O_3N)_2$-$H_2SO_4\ 5H_2O$ = 786 69 White rhombic crystals, decomp 278, soluble in water, slightly soluble in alcohol or ether

codeinone $C_{18}H_{21}O_3N$ The quinone form of codeine **dihydro-** Dicodide **dihydrohydroxy-** Eucodal

codethyline $C_{19}H_{23}O_3N$ = 313 19 Morphine ethylate, ethyl-morphine A derivative of morphine and homolog of codeine, m 93 **c hydrochloride** Dionine

codliver oil Oleum morrhuae, banks oil A fixed oil from the liver of *Gadus morrhua*, a salt water fish A colorless, pale-yellow, or brown oil, $d_{25°}$ 0 915–0 925, soluble in alcohol Its chief constituents are gadum and olein, morrhuic acid, phosphorus, iodine, and sulfur compounds It is an alterative, used as a nutritive in tuberculous diseases, convalesence, malnutrition, and malassimilation, as it contains several vitamins See *gadose, jecolein, morrhuol, ptomaines* **artificial-** An ergosterol or cholesterol that has been irradiated Cf *irradiation* **c o emulsion** An emulsion of codliver oil with various pharmaceutical ingredients which mask its unpleasant taste (peppermint oil and other essential oils), or make it more beneficial (phosphates, iron compounds, etc)

codol Retinol

coefficient A numerical factor by which the value of one quantity is multiplied to give the value of another, or to indicate its rate of range **activitity-** q v **distribution-** q v **c of absorption** See *absorption* **c of compressibility** (A) The relative deviation of a gas from Boyle's Law (q v) Thus $p_1v_1/p_0v_0 = (1 - A)$ where p_1, p_0, v_1 and v_0 are two sets of measurements of p and v between 1 atmosphere and zero pressure **c of conductivity** A number indicating the amount of heat or electricity that passes through a unit of thickness of substance in a unit of time, when the temperature- or potential-difference is 1°C or 1 volt, respectively **c of expansion** A number indicating the expansion of a substance for a temperature increase of 1°C Cf *Charles' Law*

coenzyme A catalyst necessary for the activation of an enzyme Cf *coferment*

cœr- See *cer-*

coferment A substance which increases the activity of a ferment or enzyme, *e g* , calcium for thrombin Cf *coenzyme*

coffee The dried seeds of *Coffea arabica, C liberica*, etc (Rubiaceae) the coffee tree or shrub of Asia, Africa, Central or South America Approximate chemical composition

	Unroasted (green)	*Roasted* (brown)
Fat	13 27 %	14 48 %
Water	11 23 %	1 15 %
Albuminoids	12 07 %	13 98 %
Sugar	8 55 %	0 66 %
Fiber	3 92 %	4 75 %
Caffein	1 21 %	1 28 %

World production in 1940 was 2,320,000 tons, coming from Brazil > Colombia > Venezuela > Central America and East Indies

coffeic acid Caffeic acid

coffeine Caffeine

cognac A high grade of brandy **c essence** (1) Ethyl nonylate or (2) ethyl chloride, used to imitate the c flavor **c oil** (1) A brandy adulterant which consists of cocoanut oil, alcohol and sulphuric acid (2) The essential oil of cognac, containing the esters of caprinic and caprilic acids (3) Ethyl oenanthate, used as flavoring agent

Cohen, Ernst Julius 1869– A Dutch chemist noted for research in physical chemistry **C , Julius B** 1859–1935 A British chemist, noted for his work on optical activity and the laws of aromatic chemistry

cohere To hold together, as, molecules of the same type Cf *adhere, van der Waals forces*

coherer An electrical resistance tube filled with a granulated conductor by which electro-magnetic waves are detected (*e g* , in wireless telegraphy), owing to the change in resistance produced by varying coherence of the particles produced

cohesion The attractive force between the same kind of molecules, that is, the force which holds the molecules of a substance together Cf *adhesion*

cohesive Sticking together

cohoba A snuff used by the ancient natives of Haiti

cohobation Repeated distillations in which the distillate is returned each time to the residue in the distillation vessel It was believed formerly to result in a higher degree of purity

cohosh An Indian (Algonkian) name for various medicinal plants, *e g* **black-** *Cimicifuga racemosa* **blue-** *Caulophyllum thalictroides*, **red-** *Actaea spicata* **white-** *Actaea alba*

cohydrol. A colloidal solution of graphite Cf *aquadag*

coil A loop, or spiral made of wire, tubing, glass or other material **induction-** A transformer for inducing an electric current, consisting of a coarse wire coil (primary coil) wound around an iron core and surrounded by a long insulated coil of fine wire in which the induced current is produced **primary-** The inner wire coil of an induction apparatus to which the potential is initially applied **resistance-** A series of wire coils of known electrical resistance, used to diminish the strength of a galvanic current or for testing the resistance of an object by comparison (bridge) **Ruhmkorff-** An induction apparatus, in which the secondary coil is of very fine and long wire, which is permanently mounted and connected with a condenser **secondary-** The outer coil of an induction coil **Tesla-** An induction coil without the iron coil, used for Tesla discharges

coinage gold An alloy of 90 % gold and 10 % copper

coinage silver An alloy of 90 % silver and 10 % copper

coir The fibers of the coconut husk, made by retting the husks in sea water and crushing between rollers, used for cables and cordage

coke The carbonaceous residue (70–80 %) of coal after the volatile constituents have been distilled off **native-** Carbonite **c oven** A retort in which coal is heated and changed to coke **c oven gas** The fuel and illuminating gas which distils from coal

coking Making coke by heating coal for about 12 hours The reaction products from one ton of coal (Pittsburgh, U S A) are

coke	1500 pounds
gas	11,360 cubic feet
tar	12 4 gallons
benzene	4 gallons
ammonium sulfate	25 pounds

Cola A genus of sterculiaceous plants, a source of caffeine **c nut** Kola

colamine C_2H_7ON = 61 06 2-aminoethanol, β-aminoethyl alcohol $NH_2CH_2CH_2OH$ A colorless liquid, d 1 022, b 171

colatannin $C_{16}H_{20}O_8$ = 340 15 Colatin The tannin from cola nuts, crystals, m 148, soluble in alcohol or acetone

colatein A crystalline phenol derived from cola nuts

colatin Colatannin

colatorium A strainer or sieve

colchiceine $C_{21}H_{23}O_6N\,H_2O$ = 403 19 A crystalline alkaloid derived from colchicum, said to be more active than colchicine Yellow needles, m 172, sparingly soluble in water, soluble in alcohol, ether or chloroform

colchicine $C_{22}H_{25}O_6N$ = 399 3 An alkaloid from the seeds of *Colchicum autumnale*, meadow saffron Yellow crystals or amorphous powder, m 135–150, soluble in water, alcohol, or chloroform It is an antineuralgic, antirheumatic, and antiarthritic **c salicylate** $C_{22}H_{25}O_6N \cdot C_7H_6O_3$ = 537 26 Cholchisal A yellow powder, soluble in water, alcohol or chloroform **c tannate** $C_{22}H_{25}O_6N\,C_{14}H_{10}O_9$ = 721 45 A yellow powder containing 38–40 % colchicine, soluble in alcohol

Colchicum (1) A genus of liliaceous plants (2) The plant, *C autumnale*, meadow saffron, autumn crocus, wild saffron, of Europe and North Africa, used as a specific for gout **c corm** The root or bulb of *C autumnale*, meadow saffron, which contains colchicine, used as a cathartic, emetic, and local stimulant **c flowers** The dried blossoms of *C autumnale* **c seeds** The seeds of *C autumnale* It contains less colchicine than the corm

colchinine $C_{22}H_{15}O_6N$ = 389 12 An alkaloid, m 146

colchisal Colchicine salicylate

colcothar Prussian red, rouge Caput mortuum, crocus martis A red variety of ferric oxide obtained by heating ferrous sulfate in air, used as a styptic and tonic, as a polishing material for lenses, gems, etc , and as a pigment

cold Relatively low degree of heat, lacking warmth **c cream** A white, scented ointment used as a cosmetic and consisting of wax, spermaceti, olive oil or other fat emulsified with rose-water or other liquid **c flow** The behavior of an apparently solid substance (*e g* pitch, rubber) as a viscous liquid, by virtue of which it has a very slow flowing motion **c storage** See *refrigeration*

Cole's test A modification of the Benedict method for determining small quantities of sugar in urine

colemanite A native calcium borate, $Ca_2B_6O_{11} \cdot 5H_2O$

Coleoptera. An order of insects which includes the beetles Cf *cantharis*

colibacterin A vaccine from Bacillus Coli

colla Glue **c animalis** Gelatin **c glutinum** Gluten **c piscium** Ichthyol **c. taurina** Gelatin

collagen Ossein A protein forming the chief constituent of connective tissue and the organic substance of bones Contains 50 75 % C, 6 47 % H, 17 86 % N, and yields glue or gelatin on boiling with water

collargol (1) Colloidal silver and silver oxide formed by reduction and stabilized by egg albumen (2) A water-soluble form of colloidal silver prepared by dialysis and evaporation of an alkaline solution of colloidal silver It is

brownish-black in color, and contains 93 % Ag

collateral Side by side Parallel Supplementary

collector Flotation promoter A substance used in flotation which increases the capacity of the air bubble to carry mineral particles, as, xanthates, dithiophosphates, creosotes

colletin A glucoside from *Colletia spinosa*, a Rhamnaceae of South America

collidine $C_8H_{11}N$ = 121 17 **alpha-** 4-ethyl-2-methylpyridine* A colorless liquid, $d_{16°}$ 0 927, b 179, soluble in water, alcohol, or ether, a constituent of coaltar **beta-** 3-ethyl-4-methylpyridine* A colorless liquid, $d_{0°}$ 0 966, b 198, insoluble in water, soluble in alcohol Obtained by the decomposition of cinchonine or from coaltar **gamma-** 2 4 6-trimethylpyridine* A colorless liquid d 0 947, b 172, sparingly soluble in water, obtained by destructive distillation of coaltar **ethyl-** $C_{10}H_{15}N$ A derivative of collidine **hydro-** A ptomaine from putrefying fish and animal tissues

colligate To connect or bind together

colligative Related or connected **c properties** Properties which can be related to one another by a mathematical function **c p of solutions** Those properties which are affected proportionally by the introduction of a solute If the solution is sufficiently dilute, the effect is independent of the chemical nature and depends solely upon the number of particles (molecules or ions) present Colligative properties are

	1 Mol solute per liter solution causes
Vapor pressure	lowering 0 5 mm
Boiling point	raising 0 54°C
Freezing point	lowering 1 85°C
Osmotic pressure	22 4 atm

collimator A telescope lens or system of lenses with a slit at its focus for rendering parallel the rays entering an optical instrument

collinsics The relationship between molecular weight, M, density, D, and refractive index, μ, discovered by H Collins $M/\Sigma V_r = D$, and $(\mu - 1)(\Sigma V_r) = \Sigma R_0$ where ΣV_r is the sum of the relative volumes, and ΣR_0 the sum of the optical refractivities Cf *Lorentz-Lorenz equation*

	V_r	R_0		V_r	R_0
Al	9 05	7 865	Mn	13 02	11 53
	12 05	4 863		11 53	13 02
As	19 58	17 75	N	3 8	3 8
B	3 865	3 865	Na	11 865	3 864
Be	4 62	3 733	O	2 51	1 346
C	8 0	3 333		4 45	1 747
Ca	14 54	10 52		7 53	1 654
	13 25	13 25	P	14 56	10 51
Cl	15 085	10 82	Pb	19 81	35 459
Cu	7 13	14 22		17 42	28 264
F	5 42	0 26	S	15 53	5 75
Fe	10 08	19 58	Si	13 02	11 53
	5 76	2 613		13 83	9 78
K	22 29	7 49		17 61	9 625
Mg	8 71	6 0015		18 91	10 461
	7 51	5 031	Zr	15 59	21 59

Thus, for KCl or sylvite, M = 39 + 35 5, D = 1 996 and μ = 1 49 Thus 74 5 — (22 29 + 15 085) = 1 996, and (7 49 + 10 82) = 0 49(22 29 + 15 085)

collinsonioid The combined principles from the root or rhizomes of *Collinsonia canadensis*, stone-root, a Labiatae, used as a diuretic, alterative and diaphoretic

collision A change in the energy of a molecule produced by interaction with another material system (molecule, atom or electron) or by electromagnetic induction Cf *induction, photon, quantum, chain reaction* **atomic-** Contact with or between atoms, as, in bombardment with α-rays Cf *Wilson tracks* **molecular-** The mechanical contact of two molecules, which is thought to be essential for a reaction to occur

collochemistry Colloidal chemistry

collodion A solution of pyroxylin (gun cotton nitrated cellulose) in a mixture of alcohol and ether It is a colorless or slightly yellowish, clear or opalescent, thick liquid containing not less than 5 % dissolved matter Used as a reagent for differentiating phenol and creosote, medicinally for covering wounds, burns, or ulcers, and as an air-tight seal **c cotton** Pyroxylin

collodium Collodion

colloid A state of subdivision of matter which comprises either single large molecules (*molecular c*, as, proteins etc) or aggregations of smaller molecules (*association c*, as, gold etc) These particles of ultramicroscopic size (*dispersed phase*) may be solid, liquid or gaseous, and are surrounded by different matter (*dispersion medium* or *external phase*) which may also be solid, liquid, or gaseous Hence there are eight possible combinations (see table of *colloidal systems*) The size and electrical charge of the particles determine the phenomena observed with colloids, *e g*, Brownian movement, diffusion through semi-permeable membranes, etc The sizes of colloids range from 1×10^{-7} cm to 1×10^{-5} cm (or $\frac{1}{10}$ to $\frac{1}{1000}\mu$) The smallest particle of colloidal gold observed by Zsigmondy was $1\ 7 \times 10^{-7}$ cm **association-** A compound whose molecules aggregate to form colloidal particles Cf *bond, co-ordination* **dispersion-** A dispersoid or finely-divided substance **emulsion-** An emulsoid, or a liquid dispersoid, *e g*, finely-divided droplets of a liquid suspended in another liquid **eu-** A c whose molecules are over 2500 Å U long **hemi-** A c whose molecules are 50–250 Å U long **heteropolar-** A c which consists of polar molecules, as, salts, albuminoids, sugars, etc Cf *heteropolar bond* **homopolar-** A c which consists of nonpolar molecules, as, hydrocarbons, rubber, etc **hydrophilic-** See *hydrophile* **hydrophobic-** See *hydrophobe* **irreversible-** A finely-divided substance which, once coagulated or precipitated, cannot be readily reversed to the colloidal state **lyophilic-** See *lyophile* **lyophobic-** See *lyophobe* **meso-** A c whose molecules are 250–2500 Å U long **molecular-** A compound whose molecule is of colloidal size, e g 100–500$\mu\mu$ long and 0 2-1$\mu\mu$ thick **protective-** A substance which promotes the stability of a heterogeneous system, or of the colloidal state by enveloping the particles **reversible-** A finely-divided substance which, when coagulated, precipitated, or obtained by evaporation of a solution, can readily be converted to the colloidal state **suspension-** A suspensoid, or a solid dispersoid, *e g*, finely-

divided solid particles of ultramicroscopical size in a liquid

c equivalent The number of atoms sharing a free electric charge **c mill** A grinding mill for making emulsions and suspensions, or for the disintegration and dispersion of solids or liquids **c zone** See *orientation, zone*

colloidal Pertaining to colloids **c metal** A finely-divided metal consisting of particles of 1 to 100 millimicrons ($\mu\mu$) Since they expose a large surface they are very reactive, many of them act as catalysts in industrially important reactions and processes **c movement** *Brownian movement* **c state** The state of being finely subdivided, *e g*, a colloid **c system** See *colloid*

colophonic acid Colopholic acid An acid derived from turpentine, used in plasters, soaps, or cements Cf *abietene*

colophonite (1) An amber-colored andralite (iron *garnet*, q v) (2) A colophony found in the soil Cf *copal*

colophonium Rosin

colophonone $C_{22}H_{18}O_2$ = 314 2 A distillation product of pine rosin

colophony Rosin

color, colour (1) The visual sensation caused by light (2) Light of a definite wavelength or group of wavelengths which is emitted, reflected, refracted or transmitted by an object A color is defined by three properties *hue*- The wave-length of the monochromatic light, *i e*, shade *saturation*- The percentage of the light of the above wave-length present, *i e*, strength *brightness*- the amount of light reflected as compared with a magnesium oxide standard under the same conditions, *i e*, luminosity Cf *C I E units, c diagram, c theory, colors, dyes, pigments* **artists'**- The finely-ground pigments used by artists **basic**- The three colors red, yellow and blue **complementary**- Any two colors of the spectrum which produce white light when combined or blended with each other, not

COLLOIDAL SYSTEMS

Surrounding medium, dispersion medium, continuous or external phase

Enclosed medium, dispersed or discontinuous phase, colloidal matter	in Solid	in Liquid (Hydrosols)	in Gas (Aerosols)
Solid	(1) **Solid sols** Alloys, colored glass, certain precious stones, paper	(2) **Suspensions** Paints, milk of magnesia, collargol, etc	(3) **Smokes** Iodine vapor, cement dust, HCl and NH_3, etc
Liquid	(4) **Gels** Celluloid, jellies, green leaves, glue	(5) **Emulsions** Milk, blood, liniments, crankcase oil, protoplasm	(6) **Fogs** Sprays, mists, clouds, visible steam
Gas	(7) **Solid foams** Rubber, pumice, plaster, fire foam, lungs, adsorbed gases, aerogels	(8) **Foams** Lather, froths, mayonaise, whipped cream	(9) No example

collose A substance produced in woody tissues as an intermediate stage in the process of liquefaction

collosol A colloidal solution of a drug (*e g*, alkaloids) or metals (Sb, Ag, Au, As, Bi, Cu, Fe, Hg, Mn, etc), used in ampoule medication Cf *electrosol*

collotype Artotype A method of printing from a gelatin surface on a glass plate sensitized with potassium dichromate and exposed under a negative

colloxylin. Collodion

colocynth Bitter apple Bitter cups The fruit of *Citrullus colocynthis*, a Cucurbitaceae, of Asia Minor It is a cathartic

colocynthein $C_{44}H_{64}O_{13}$ = 800 6 A resin from colocynthin

colocynthin $C_{56}H_{84}O_{23}$ = 1124 8 A glucoside from the fruit of *Citrullus colocynthis* It is a strong purgative and is used in small doses only

colog Abbreviation for co-logarithm Colog $x = -\log x = \log 1/x$

colombic acid Calumbic acid Cf *columbic acid*

colonial spirit Methanol

colonies Clusters of bacteria which are visible to the eye

colophene $C_{20}H_{32}$ = 272 3 A hydrocarbon of turpentine occurring as a colorless liquid

colopholic acid Colophonic acid

PRIMARY COLORS

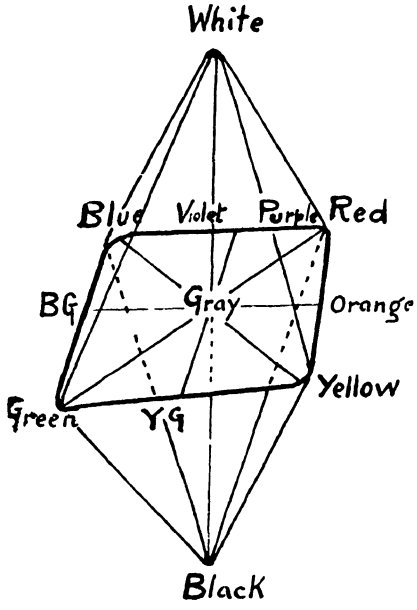
Wavelength λ in μ	*Name*	*Relative visibility*
0 410	violet	0 0012
0 470	blue	0 091
0 520	green	0 710
0 555	yellow-green	1 000
0 580	yellow	0 870
0 600	orange	0 631
0 650	red	0 107
0 700	dark red	0 0041

as pigments, but as rays of colored light Complementary colors are those which stand opposite in the color diagram The c colors in *pigments* are Red and green, blue and orange, etc See under *complementary color* **compound-** A color produced by mixing two or more primary colors as pigments, as,

green—from yellow and blue
olive—from green and red,
brown—from red, green, and black,
orange—from yellow and red, etc

contrast- Complementary- **primary-** (1) The seven hues of the rainbow or solar spectrum red, orange, yellow, green, blue, indigo and violet (2) The basic colors red-green-violet, or (pigments) red-yellow-blue Cf *Helmholtz's theory* **secondary-** Compound-

c diagram A chart or table in which the relationship of the principal colors is illustrated



Color diagram

In the figure the colors of the spectrum are in a plane around the center Those colors which stand opposite each other are complementary, if subtracted from each other (as with pigments) they produce darker shades and finally black, if combined with each other (as in colored lights) they produce lighter tints and finally white **c filter** Light filter A solid, liquid or gaseous layer of a substance which absorbs certain wavelengths Cf *c screen, absorption cell, sodium flame* **c photography** A mechanical process which records the form and color of an object photographically The general principle is to take two or three exposures with two or three differently colored color screens, and then print the respective negatives upon two or three films which are stained in the complementary colors On superimposing the prints a transparency in natural colors is obtained In moving pictures green and red films are used, while in the various processes for plates either multi-colored screens consisting of lines or dots or specially prepared plates (*e g*, the Lumiere plate) are used **c reaction** A chemical change in which a change of color occurs **c scale** (1) See *c diagram, spectrum* (2) Temperature Approximate temperatures of heated metals are

incipient red heat	500– 600°C
dark red heat	600– 800°C
bright red heat	800–1000°C
yellowish red heat	1000–1200°C
incipient white heat	1200–1400°C
white heat	1400–1600°C

c screen A color filter used in photography to render colored objects more contrasting in a black and white print Cf *complementary, photosensitizer* **c screen law** To increase the photographic intensity of a color on the film or plate, a screen of the complementary color is used To decrease the effect a screen of the same color is used **c theory** (1) The absorption of certain wavelengths of light by, or the color of solutions of certain compounds may be due to

(a) Solvation—or the formation of hydrated ions, as $Cu(H_2O)_4^{++}$, in which case the dehydrated compound is colorless

(b) Association—or the formation of stress compounds from free radicals, as Ph_3C CPh_3, in which case the color changes on dilution

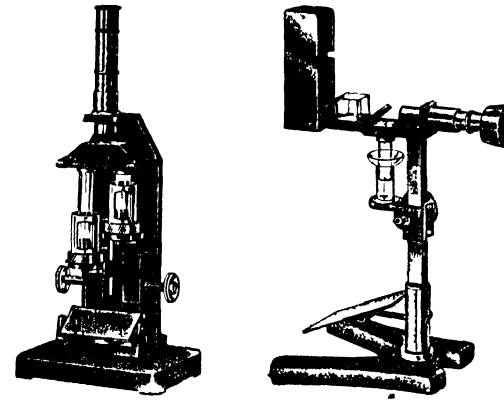
(c) Ionization—or the formation of ions from the molecule, as in phenolphthalein, in which case the unionized molecule is differently colored

(d) Tautomerism—or a change in the structure, as in the leuco- and erythro-salts or in quinone formation

(2) The emission of a certain wavelength of light is due to electrons which oscillate from one atomic orbit to the other This can be caused by high temperature, electricity or magnetism See also *Helmholtz's theory, Beer's law, Lewis's theory, Witt's theory*

coloradoite HgTe A mercury telluride from Colorado

colorimeter A device for determining the intensity and shade of colored solutions, or for comparing standard color solutions (comparator) It is used in quantitative analysis Cf *comparator, tintometer, chromophotometer, tonocolorimeter, calorimeter* See figures



Colorimeters
(1) Duboscq (2) Bock-Benedict

colorimetric analysis The quantitative determination of a substance by comparing the intensity of the color produced by a reagent, with that produced similarly in a standard of known strength Cf *Nessler solution, indicators*

colorimetry (1) Colorimetric analysis (2) Color measurement Cf *calorimetry*

coloring matter A substance which produces the sensation of color See *anthocyanins, colors, dyes, pigments* **c tablet** A tablet which readily dissolves in water and contains a definite amount of a pure color It is used as a convenient method to color small quantities of pharmaceutical preparations

colors Substances used as pigments or dyes, q v To indicate the shade of a color or dye, letters are sometimes used thus

G = gelb (German) = yellow
J = jaune (French) = yellow
JJ = intense yellow
O = orange
OOO = very intense orange
R = reddish tint
RR = very red
S = black or sulfonation

colostrum (1) The first secretion of the mammary glands, consisting of a thin milk (2) A deep orange-colored fat, m 28–38, similar to lard, obtained from top milk by the action of 3–4 times its volume of HCl (d 1 12) at 92°C for 1½ hours

columba Calumba

columbate Niobate A salt of the type $MCbO_3$ or $M_2O\ Cb_2O_5$, as $NaCbO_3$, sodium c , and $Ag_2O\ Cb_2O_5$, silver c They often form complexes, thus $Na_8Cb_6O_{19}$ from sodium c

columbian spirits Methanol

columbic A compound containing pentavalent columbium=Cb≡ (niobic=Nb≡) **c acid** (1) $HCbO_3$ = 142 1 An insoluble white powder derived from Cb_2O_5, soluble in alkalis forming complex columbates (2) The compound $3Cb_2O_5\ 4H_2O$, which gives the acid $H_8Cb_6O_{19}$

columbin $C_{21}H_{22}O_7$ = 386 2 A glucoside from the root of *Jateorrhiza calumba* Yellowish crystals, m 182, soluble in alcohol, chloroform or ether, sparingly soluble in water, it is a bitter tonic

columbite The mineral $(Fe,Mn)(Cb,Ta)_2O_4$ Cf *tantalite*

columbium Cb = 92 91, or niobium (Nb) A metallic element, atomic no 41, discovered in 1801 by C Hatchett in columbite, a mineral named in honor of America In 1802 A G Ekeberg isolated a new metal from yttrotantalite, a mineral of Sweden The elemental nature was not clearly recognized until 1844 when H Rose isolated from a columbite of Bavaria two metals, called niobium and peloponium Niobium proved to be an element and peloponium a mixture of tantalum and columbium It is a steel-gray shining metal, d 8 4, m 1950, which forms two series of compounds columbous (valency of 3) and columbic (valency of 5), and belongs to the fifth sub-group of the periodic system Columbium compounds are not technically important and are little known **c bromide** $CbBr_5$ = 492 68 Purple-red crystals, decomp by water **c chloride** (1) $CbCl_3$ = 199 47 Columbous chloride, niobous chloride Violet crystals, soluble in water (2) $CbCl_5$ = 270 3 Columbic chloride, columbium pentachloride, niobic chloride, niobium pentachloride Yellowish hygroscopic crystals, d 2 75, m 194, b 240, decomp in air, water, or alcohol to form HCl **c fluoride** CbF_5 = 188 1 Niobic fluoride Colorless monoclinic prisms, d 3 293, m 72, b 220, hydrolysed in water **c hydride** CbH = 94 1 A black powder, d 6 4, decomp when heated **c minerals** Columbium occurs with titanium and usually, the rare earth metals columbite, $FeCb_2O_6$, tantalite, $(Fe,Mn)(Ta,Cb)_2O_6$, samarskite, $(Fe,Ca,UO_2)_3(Y,Ce)_2(Ta,Cb)_6O_{21}$ **c. oxalate** $Cb(HC_2O_4)_5$ = 538 34 Monoclinic colorless crystals, decomp by water **c oxide**

(1) CbO = c monoxide (or Cb_2O_2 = c dioxide)
(2) Cb_2O_3 = c trioxide
(3) CbO_2 = c dioxide (or Cb_2O_4 = c tetroxide)
(4) Cb_2O_5 = c pentoxide

(1) CbO = 219 10, insoluble in water or acids, d 6 5 (2) Cb_2O_3 = 454 2, insoluble in all solvents except HF (3) CbO_2 = 125 10 A black insoluble powder (4) C pentoxide **c oxybromide** $CbOBr_3$ = 348 85 Columbyl bromide Yellow crystals, hydrolysed in water **c oxychloride** $CbOCl_3$ = 215 47 Columbyl or columboxy chloride Colorless needles, subliming 400, and hydrolysing in water **c pentoxide** Cb_2O_5 = 266 2 (Nb_2O_5) Columbic acid, niobic acid, niobium pentoxide, columbic oxide, niobic oxide A white microcrystalline powder, d 4 61, m 1520, which becomes yellow on heating, insoluble in water or acids, soluble in HF **c potassium fluoride** $CbOF_3\ 2KF\ H_2O$ = 300 32 Columboxy potassium fluoride, niboxy potassium fluoride White, shining scales, very soluble in water

columbo Calumba **American-** Fraserin

columbous A compound of trivalent columbium Cb ≡, (niobous, Nb ≡)

columboxy A compound of pentavalent columbium containing the trivalent radical CbO≡ (niboxy, NbO≡)

columbyl Columboxy

column A pillar **c still** A still for fractional distillation

colza Rape seed oil

comanic acid $C_6H_4O_4$ = 140 1 Pyrone-α-carboxylic acid An acid derived from chelidonic acid, slightly soluble in water, m 250

combination (1) The union or mixing of two or more substances, to form a new substance (2) A chemical reaction in which two elements combine and form a binary compound, or two binary compounds combine and form a complex compound This usually involves oxidation or reduction **molecular-** The union or aggregation of molecules by chemical or coordinate bonds (q v), as,

1 *equilibrium* c of two molecules of odd molecular number, *e g* free radicals, q v
2 *irreversible* c or polymerization, *e g* , paraformaldehyde Cf *condensation*
3 *reversible* c or association, *e g* hydrone (q v) Cf *liquids, bonds*

c. principle The frequency (q v) of a radiation may be represented by the difference between two terms

combining Uniting or joining together **c weight** Equivalent weight

combustible Inflammable **c gases** The fuel gases used in industry, as, hydrogen, hydrocarbons, carbon monoxide and their mixtures

combustion Burning, or a chemical change accompanied by the liberation of heat, sound or light, or all three **fractional-** q v **heat of-** See under *heat* **organic-** The decomposition of organic compounds, and the collection of the combustion products (see *elementary analysis*) **slow-** (1) The slow oxidation of a substance (2) The combination of two gases by means of a heated wire **spontaneous-** (1) Accelerated combustion effecting a sudden outburst of heat and light (explosion) (2) Self-ignition, q v **wet-** Oxidation by means of strong oxidizing agents, as, sulfuric acid-dichromate mixture

c boat A small tray of refractory material (porcelain, alundum, platinum) used in quantitative elementary analysis for burning organic compounds in a combustion tube **c capsule** A small crucible of porcelain used in coal analysis **c furnace** A heating appliance used in the elementary analysis of organic compounds, consisting of a row of six, or more bunsen burners with a gutter in which the combustion tube is placed, and side tiles for regulating the temperature **c train** The arrangement of apparatus in elementary organic analysis usually hydrogen, oxygen, and air tanks, potash bulb, calcium chloride tube, combustion tube and furnace, potash bulb, and calcium chloride or sulfuric acid tube **c tube** A wide glass, silica, or porcelain tube, resistant to high temperatures **c tube furnace** (1) C furnace (2) An electrically-heated spool used for combustion work

comenamic acid $C_6H_5O_4N$ = 155 1 $C_5H_2(OH)O(NH)COOH$ Colorless crystals

comenamide $C_6H_6O_4N$ = 155 1 $C_5H_2(OH)O_2CONH_2$ Colorless crystals

comenic acid $C_6H_4O_5$ = 156 03 Colorless crystals derived from meconic acid

comminute To bring to a fine state of division

comminution The process of grinding or breaking into small fragments, *e g* , cutting, rasping, grating, slicing, levigating, pulverizing, triturating, etc Cf *chopper, grinder, crusher, powderizer, mill*

common salt Sodium chloride

commutator A device for interrupting or reversing an electric current (*e g* , the mercury or Pohl commutator) **dynamo-** A transformer of alternating current into direct current, attached to a dynamo

comolised Highly aggregated

comosic acid An acid substance derived from the bulbs of *Muscari comosum*, a Liliaceae

comparator (1) An electrical device for the calibration of alternating current instruments (2) See *colorimeter*

comparison spectroscope A spectroscope in which two different spectra can be produced simultaneously side by side

comparison tubes A set of test tubes of the same diameter, used in colorimeters for the comparison of colors

comparoscope A device attached to a microscope for comparing two different slides simultaneously

compatibility The non-impairment of the respective properties of two or more drugs when administered together **in-** The impairing influence of two or more substances on each other when mixed, *e g* , acids and bases, or substances which form an insoluble precipitate Cf *incompatible*

compatible Applied to a pair of drugs which do not interfere or react chemically, physically or therapeutically with one another

compensation apparatus Potentiometer

complement (1) Supplying a missing part (2) Alexin, cytase, end-body A thermolabile substance having a haptaphore and zymophore group, the later acting destructively on the cell (see *Ehrlich's side chain theory*) (3) The difference between an acute angle and 90° **c fixation** Complement deflection, complement deviation The combining of the zymophore group of the complement to make it inert The reaction product obtained by adding to a hemolytic serum a serum containing an antibody and corresponding antigen (*Ehrlich's side chain theory*) This principle is utilized in a number of diagnostical tests, *e g* , Wassermann reaction, Abderhalden test, etc

complementary color See *colour* **c c screens.** (1) Copper ruby glass (red) and copper glass (blue), (2) uranium glass (yellow) or chromium glass (greenish yellow) and cobalt glass (blue) See *color*

complex Complicated, not simple **c acid** A combination of two or more non-metallic compounds or acid radicals, *e g* , of 2HF and SiF_4 to give H_2SiF_6 **c compound** A combination of two or more compounds or ions, *e g* , 4KCN and $Fe(CN)_2$ to give $K_4Fe(CN)_6$ **c ion** A complex electrically charged radical or group of atoms, *e g* , $Cu(NH_3)_2^{++}$ **c reaction** A chemical change in which two or more reactions take place simultaneously

component (1) An ingredient or part of a mixture (as distinct from the *constituent* of a compound) (2) The smallest number of chemical substances capable of forming all the constituents (q v) of a system in whatever proportion they may be present See *phase rule*

Compositae Composite family A group of herbaceous or woody plants, rarely shrubs, with many florets arranged in compact heads as a compound flower on a common receptacle, as the dandelion, sunflower, etc Many members of this family yield important drugs

roots	
Taraxacum officinale	dandelion, taraxacum
Cichorium intybus	chicory
Anacyclus pyrethrum	pellitory, pyrethrum
Inula helenium	elecampane, inula
Arctium lappa	burdock root, lappa
Polymnia uvedalia	bearsfoot
Lactuca virosa	lactucarium
Echinacea angustifolia	echinacea
Arnica montana	arnica root
Cnicus arvensis	Canada thistle, enicin
leaves	
Erechthites hieracifolia	firewood
Pterocaulon pycnostachyon	black root
Ambrosia artemisiaefolia	ragweed
Xanthium strumarium	cocklebur
Tanacetum balsamita	tanacetum
herbs	
Eupatorium perfoliatum	eupatorium
Eupatorium purpureum	queen of the meadow
Grindelia species	grindelia
Tanacetum vulgare	tansy
Artemisia absinthium	wormwood
Artemisia tridentata	sage brush
Erigeron species	fleabane
Gnaphalium polycephalum	life everlasting
Helenium autumnale	sneezewort

Achillea millefolium	yarrow
Tussilago farfara	coltsfoot
Cnicus benedictus	blessed thistle
Silphium laciniatum	rosinweed
Rudbeckia laciniata	thimble weed
Bidens bipinnata	Spanish needles
Senecio aureus	ragwort
Solidago odora	golden rod
Lactuca species	lettuce
Matricaria parthenium	feverfew
Anthemis cotula	wild chamomile
Veronica nigritiana flowers	vernonine
Matricaria chamomilla	German chamomile
Anthemis nobilis	English chamomile
Artemisia paucifiora	Levant wormseed
Calendula officinalis	marigold
Carthamus tinctorius	safflower
Pyrethrum species	insect powder
seeds	
Helianthus annuus	sunflower seeds
fruits	
Arctium lappa	burdock fruit
juice	
Lactuca virosa	lactucarium

composition The elements or compounds which enter into a material or which are produced from it by analysis Cf *constitution, e g* we know the *composition* of glass, but not its *constitution*

compost A mixed organic manure produced by the natural decomposition of waste organic matter

compound (1) A substance whose molecules consist of unlike atoms, and whose constituents cannot be separated by physical means A compound differs from a physical mixture by reason of the definite proportions of the constituent elements (a proportion which depends upon their atomic weights), by the disappearance of the properties of the constituent elements and the appearance of entirely new properties characteristic of the compound (2) To mix drugs, or make up a prescription **acyclic-** An organic compound in which the carbon atoms are arranged in an open chain **addition-** A compound formed by the union of two simpler or binary compounds $NH_3 + HCl = NH_4Cl$, or $K_2O + SO_3 = K_2SO_4$ **additive-** A c formed by the saturation of double or triple bonds, as, $CH_2Cl\ CH_2Cl$ from $CH_2\ CH_2$ **aliphatic-** An acyclic compound or paraffin, *e g*, the methane series **amino-** An organic compound containing the NH_2— radical **aromatic-** An organic c in which the carbon atoms form a ring or closed chain, *e g*, benzene series **asymmetric-** A c containing one or more optically active carbon atoms **azo-** An organic c containing the —N N— group **binary-** A c whose molecules consist of only two kinds of atoms, *e g*, NaCl, $FeCl_3$, CH_4, C_6H_6, etc **carbon-** See *organic c* **chain-** A cyclic compound **closed chain-** Aromatic compound **coal tar-** C derived from coal tar, especially aromatic organic c **condensation-** A c formed by the union of two or more molecules, especially organic compounds, in which one or more molecules of water are usually liberated **coupling-** A c which serves as a substitute for some other atom, generally hydrogen Cf *anhydrosynthesis, derivative* **cyclic-** Aromatic compound **diazo-** A compound containing the divalent —N N— group **endothermic-** A c formed with the absorption of heat, they are usually unstable (explosive) and liberate heat on decomposition **exothermic-** A c formed with the liberation of heat Such compounds are usually stable, and their decomposition requires energy **fatty-** Aliphatic c **homocyclic-** An aromatic c containing only carbon atoms in its ring, *e g*, benzene, naphthalene **heterocyclic-** An aromatic c containing other atoms besides carbon atoms (N, O, S, P, etc,) in its ring, *e g*, pyridine, quinoline, etc **index-** A c from which another is derived by substitution, thus methane is the 1 c for chloromethane, nitromethane, formic acid, etc **inorganic-** C containing no carbon atoms The majority of inorganic compounds (mineral acids, mineral bases, and metallic salts) are polar, *e g*, ionize in solution, and consist of electro-positive and electro-negative parts **metameric-** Metamers **molecular-** (1) Addition c (2) See *combination, association, polymerization* **nonpolar-** A more or less unstable compound consisting of elements having weak electrical forces, *e g*, carbon compounds See *compounds* **open-chain-** Aliphatic compounds **organic-** Compounds containing carbon and hydrogen atoms, with or without other atoms in the molecule The majority are nonpolar, *e g*, they have no distinctly positive or negative part, and do not ionize (except the metallic salts of organic acids) **organo-metallic-** Organic c in which a hydrogen atom (or atoms) is replaced by a metal, *e g*, zinc diethyl $Zn(C_2H_5)_2$ cacodyl **paraffin-** A saturated aliphatic hydrocarbon **polar-** Fairly stable compounds consisting of elements of strong electro-motive force, *e g*, NaCl, $CuSO_4$, etc See *compounds* **quarternary-** (1) A compound whose molecule consists of four different kinds of atoms, *e g*, $NaHSO_4$, $NaAl(SO_4)_2$ (2) A combination of a fully substituted ammonium radical with a halogen, *e g*, tetra-ethyl ammonium iodide, $N(C_2H_5)_4I$, (analogous to NH_4I) **ring-** See *aromatic c* **series of-** Compounds containing the same positive or negative radical Many metals have two or more series of compounds, *e g*, ferrous compounds, ferric compounds, and ferrates Nearly all non-metals form two or more series of compounds, *e g*, sulfides, sulfites, sulfates, etc **saturated-** A carbon c in which all the bonds of carbon are satisfied, hence, compounds containing no double or triple bonds **spiro-** An organic ring compound in which one carbon atom is common to two rings **stable-** A compound which does not readily decompose, and which resists the influence of heat and other agents **substitution-** A compound formed by the replacement of certain atoms by other atoms or group of atoms Thus C_6H_5Cl is a substitution compound of C_6H_6, $C_6H_6Cl_2$ is an addition compound of C_6H_6 **sulfur-** A c containing sulfur, especially organic compounds containing divalent sulfur **ternary-** A c whose molecules consist of three different kinds of atoms, *e g*, KCN, $Fe_2(SO_4)_3$, $C_6H_{12}O_6$ **tertiary-** Ternary c **unsaturated-** A carbon compound which contains one or more double or triple bonds **unstable-** A c which readily decomposes

c ethers Esters **c microscope** See *microscope* **c molecule** A molecule consisting of two or more kinds of atoms, (as H_2S), thus differing from an elementary molecule which consists of only one type of atoms (*e g* H_2) **c protein** See *conjugate protein*

compounds, classes of. Cf *bonds*

A *Polar* Compounds which	B *Nonpolar* Compounds which
(a) ionize and conduct an electric current (electrophils)	(a) do not ionize and do not conduct an electric current
(b) are very reactive	(b) are relatively inert
(c) associate, and form double molecules and complex ions	(c) do not associate, but may polymerize to complex molecules
(d) possess a condensed structure	(d) possess a frame structure
(e) exhibit tautomerism	(e) exhibit isomerism
(f) have a high dielectric constant	(f) have a low dielectric constant
(g) are generally known as inorganic substances	(g) are generally known as organic substances

compral Cyrinal A brand of pyramidon and trichloroethanol urethane, used as an analgesic

compressed gases A gas that is pumped at high pressure into a steel cylinder for shipment The gases used in industry and their relative importance are shown by the following statistics (1922) of American manufacturers

INDUSTRIAL COMPRESSED GASES

Name	Number of cylinders in use	Shipping regulations	
		Spec	Label
Acetylene	2,500,000	8	red
Ammonia	200,000	4	green
Air			green
Argon	1,000	3a	green
Blaugas	c	3 7	red
Carbon dioxide	500,000	3	green
Chlorine	20,000	25	green
Coal gas	c	3 7	red
Helium	80,000	3a	green
Hydrocarbon	c	3 7	red
Hydrogen	200,000	3a	red
Hydrocyanic acid	a	33	green
Methyl chloride	1,000	25	green
Neon	1,000	3a	green
Nitrogen	b	3a	green
Nitrous oxide	50,000	3	green
Oxygen	1,500,000	3a	green
Petroleum gas	c	26	red
Phosgene			red
Pintsch gas	c	3 7	red
Sulfur dioxide	10 000	25/27	green

a Transported in tank trailers by automobile
b Not usually filled in cylinders
c Fuel gases are used in cylinders under various trade names calorine, carbo-hydrogen, coal-gas, gasol, kutting-gas, pyrogen, thermoline, etc , Cf *cylinders*

compressibility The resistance offered by substances to high pressure **coefficient of-** See *coefficient* Cf *piezometer*

Compton, Arthur Holly 1892– American physicist and Nobel prize winner (1927) **C Karl Taylor** 1887– An American physicist noted for atomic research **C effect.** Scattered homogeneous x-rays give rise to a change of wavelength which depends on the direction of observation It corresponds with fluorescence Cf *Raman effect* **C rule** The atomic weight (A) multiplied by the heat of fusion (h) and divided by the absolute melting point (T) gives the number 2, hence, $Ah/T = 2$

conalbumin A noncrystalline albumin of egg white

conamarin A glucoside from the root of hemlock, *Conium maculatum*, an Umbelliferae Cf *coniine*

concanavalin A globulin from jack beans

concave Presenting a depressed or hollow surface **c lens** See *lens* **c mirror** See *mirror*

concentrate (1) In chemistry To increase the strength by reducing the amount of unwanted material (2) In physics To bring to one point or center

concentration (1) In chemistry a Increasing the amount of a dissolved substance either by evaporation or adding more of the substance b The strength of a solution, and the mass per unit volume, as in molal- C is commonly expressed as

percentage, %, or gm per 100 cc
molarity, M, or moles per liter
molality, *M*, or moles per 1000 grams
normality, N, or equivalents (in grams) per liter

(2) In physics Gathering together that which is diffused, *e g* , light, sound, or heat **absolute-** The c of the active ion of a substance, *e g* , the H^+ of an acid **hydrogen-ion-** The number of hydrogen ions in grams per liter This indicates the acid or alkaline reaction of a solution (see *hydrogen ion*) **ionic-** The number of gram-ions in a unit volume of solution These indicate the degree of ionization **molal-** The number of moles (gram molecules) in a unit volume (liter) which, in the case of gases, is expressed in terms of their pressures, in the case of solutions by concentration proper, and abbreviated as M-solution (Cf *molality*) **normal-** The number of equivalent moles per liter It is abbreviated as N-solution

c limit The maximum dilution of a substance at which it may be detected by a particular chemical reaction

concentrator A mechanical device for increasing the percentage of a substance or diminishing the bulk of a material by the elimination of the inert matter Cf *separator*

concentric Describing a number of rings which have a common center

concha A shell

conche Four shell-like pots with granite bottoms and heavy rolls, used in chocolate manufacture

conching The rolling of chocolate mixtures from a few hours to seven days, to develop flavor and mildness

conchinine Quinidine

conchiolin $C_{30}H_{48}O_{11}N_9 = 710\,8$ A protein from the shells of molluscs, resembling keratin

concrete A mixture of gravel, broken rock, and sand held together by cement (q v)

condensation (1) Conversion to a more compact form (2) Transformation from the gaseous to the liquid state (3) A union and combination of similar molecules to form a more complex compound (polymerization, etc) (4) A union of like or unlike molecules, usually with elimination of one or more molecules of water, HCl, or

alcohol, etc , as, $6HCHO + 4NH_3 \rightarrow C_6H_{12}N_4 + 6H_2O$, and $2CO(NH_2)_2 \rightarrow C_2H_5N_3O_2 + NH_3$ (5) An accumulation of electrons, *e g* , in a condenser (6) The formation of a pencil of parallel or convergent light rays from convergent rays, *e g* , by means of a concave mirror or a convex lens

condensed (1) Reduced in volume (2) Liquefied from a gas or vapor **c nucleus** See *nucleus*

condenser (1) A device which concentrates matter or energy (2) An apparatus for cooling vapors to liquids, *e g* , **Liebig-**, **Squibb-**, etc (3) A device for the polymerization of organic compounds (4) A series of insulated conductors for the accumulation of electricity (see *electrical-*) (5) An optical instrument or arrangement of lenses or mirrors, *e g* , **Abbé-** **Abbé-** See *Abbé* **bull's eye-** A convex lens, which concentrates the light upon the mirror of a microscope **electrical-** An electrical device for storing electrons, it consists of sheets of tin foil separated by paraffin, with the alternate tin foils connected to a common terminal A microfarad condenser contains about 3600 sq in of tin foil **high potential-** A series of alternating brass sheets and glass plates in an oil-filled box, used in high-frequency experiments, wireless telegraphy etc **Kjeldahl-** A series of tubes arranged in a water cooled box for condensing Used in nitrogen determinations **Liebig-** A water-cooled tube attached to a flask or retort Generally two straight glass tubes, one in the other Cold water passes through the outer, and the vapor to be condensed passes through the inner tube **paraboloid-** q v **reflux-** q v **substage-** Abbé-

c flask A large spherical flash mounted and filled with liquid, used to absorb the heat from a source of light and to concentrate its intensity **c tube** The inner tube of a condenser

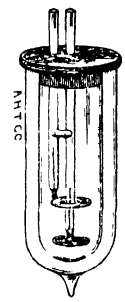
condiment A spicy or stimulating vegetable product, used for its flavor and not its food value, as, spices, q v

condistillation The separation of organic substances by distilling with another liquid (*e g* , hydrocarbons) Cf *steam-distillation*

conductance (1) The capacity to convey energy, as heat or electricity (2) The ratio between an electric current flowing through a unit cube and the difference in potentials between its ends, hence, the reciprocal of resistance, q v

conduction The property of transmitting or passing along matter or energy **air-** C by a current of air **electrolytic-** The passage of electrons by means of ions **sound-** The passage of sound waves in air **thermal-** The transmission of heat by materials

conductivity (1) The degree of conduction, the capacity for transmitting electricity, heat, light, or sound (2) The quantity of electricity transmitted per unit area per unit potential gradient per unit time, Λ **coefficient of-** See *coefficient* **electrical-** See *electrical* **equivalent-** The ratio of the measured specific c to the number of gram equivalents of salt in 1 cc solution Cf degree of *ionization* **heat-** Thermal- **limiting-** The c of a solution at infinite dilution, *i e* , when ionization is complete **molal-** or **molecular-** The c in reciprocal ohms of a solution containing 1 mol of solute placed between electrodes 1 cm apart, *i e* , the specific c multiplied by the number of cc containing 1 mol of solute **specific-** The reciprocal, in mhos of the specific resistance of an electrolyte **super-** The abnormally high conductivity of metals at temperatures near absolute zero **supra-** Super- c **thermal-** The number of gram calories passing through a 1 cm cube in 1 second for a temperature difference of 1°C **unilateral-** See *valve effect* **unit of-** Mho , the reciprocal ohm, ohm^{-1}



Conductivity cell

c apparatus A device for determining the conductivity of solutions, and consisting of conductivity cell, constant temperature bath, slide wire bridge, and telephone with resistance box, thermometer, and other accessories **c cell** A glass vessel containing two electrodes at a definite distance apart, and filled with a solution whose conductivity is to be determined *E g* , Arrhenius-, Hildebrand-, Kohlrausch-, Nernst-, Ostwald-, etc See fig **c bridge** A modified Kelvin bridge for measuring very low resistances, in which the conductivity is read as a percentage directly from the slide wire **c water** The purest water obtainable, its specific conductivity is 0.4×10^{-6} $ohms^{-1}$ cm^{-1} in a vacuum, at 18°C (Kohlrausch and Heydweiller) Cf *water*

conductometric Pertaining to conductivity measurements **c analysis** Quantitative analysis or titration in which the progressive change in conductivity is used to determine the end-point of the reaction Cf *potentiometric titration*

conductophore The molecular structure associated with the property of connecting a toxophore (q v) with protoplasm

conductor A medium which has the property of conduction **electrical-** Metals, solutions of salts, molten substances, or ionized gases which transmit electrons, or allow an electric current to pass (as opposed to insulators or non-conductors) **non-** See *insulator*

condurangin A glucoside from condurango bark **alpha-** $C_{20}H_{32}O_6$ = 368 3 A white powder, insoluble in water, m 60 **beta-** $C_{18}H_{28}O_7$ = 356 3 An amorphous yellowish powder, soluble in alcohol, sparingly soluble in

CONDUCTIVITY

Electrical	Metal	Thermal (relative)
681,200	silver	1 000
640,600	copper	7198
468,000	gold	7003
324,000	aluminum	3435
186,000	zinc	2653
146,000	cadmium	2213
144,200	nickel	1420
141,000	iron	1665
91,200	platinum	1664
76,600	tin	1528
50,400	lead	0877
27,100	antimony	0542
10,630	mercury	0148
9,260	bismuth	0177

ether, chloroform, or water, used as stomachic and astringent

condurango Candurangu, condorvine The vine, *Gonolobus condurango*, an Asclepiadaceae of Columbia, from which a valuable bark is obtained **c bark** The bark of condurango, used for cancer, as a bitter tonic and stomachic

conduransterin $C_{30}H_{50}O_2$ = 442 5 A principle from condurango bark

Condy's fluid A liquid disinfectant which, it is claimed, produces ozone during oxidation

cone A body having a circular base and tapering to a point **filtering-** A hollow cone made of porous material, *e g* , alundum, which fits into a funnel or other support Used for rapid filtration of solutions **measuring-** A slightly-tapered ruler used for measuring the inside diameters of holes or tubing **pyrometer-** Seger cone, q v A small pyramid of varying composition which has a definite melting point, used in ceramics, and pyrometry **Seger-** Pyrometer cone

conessine $C_{24}H_{40}N_2$ = 356 5 Wrightine An alkaloid from the bark of *Wrightia zeylanica*, an Apocynaceae of Ceylon It occurs in colorless, deliquescent needles, m 121, slightly soluble in water, soluble in alcohol, ether or chloroform, used as astringent and anthelmintic

configuration The spatial relationship of the atoms in a molecule Thus dextrose and levulose differ in *structure* but coincide in c with respect to the three asymmetric carbon atoms Dextrose, mannose, galactose, idose, talose, etc (*d-* and *l-* form of each) coincide in *structure* but differ in *c* Cf *structure, atomic radius* **electronic-** Constellation

congealing (1) Freezing (2) The setting of cement or the solidification of a liquid **c point.** The temperature at which a liquid or solution freezes

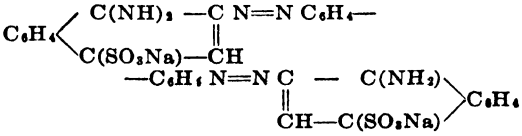
congelation Freezing, solidification The transformation from the liquid to the solid state, either by low temperature, by hydration, or by chemical reactions

conglomerate An aggregation or a mass of units, which are heaped together

conglutin A protein from the seeds of blue lupin, almond, or other leguminous plants It contains 51 13 % C, 6 86 % H, 18 11 % N, 0 32 % S, 23 10 % O

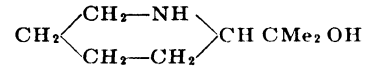
conglutinin A protein of beef serum which causes the clumping of blood cells (See *agglutinin*)

congo-blue Trypan blue **c paper** A filter paper stained with congo red solution **c red** $C_{32}H_{22}O_6N_6S_2Na_2$ Benzidine disazo-*m*-aminobenzene-sulfonic acid-*1*-naphthylamino-*4*-sulfonate of sodium A red azo-dye,

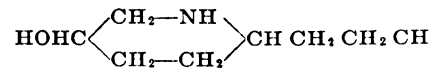


used as indicator (alkalis = red, acids = blue), and for the detection of free mineral acids in presence of organic acids **c solution** A solution of 1 gm congo red in 90 cc water and 10 cc alcohol **c yellow** $C_{24}H_{18}O_4N_6SNa$ An orange-yellow dye

conhydrine $C_8H_{17}ON$ = 143 2 Conydrine, oxyconiine, hydroxyconiine, *α*-methyl-2-piperidineëthanol



An alkaloid from the seeds of *Conium maculatum* (poison hemlock) Colorless crystals, m - 98, b 230, soluble in water, alcohol, ether, or chloroform It is a narcotic, antiseptic and anodyne **pseudo-** *2*-*α*-hydroxypropylpiperidine Colorless crystals, m 118, b 220, soluble in alcohol, water or ether



conic acid Conic acid

coniceine $C_8H_{15}N$ = 125 13 *α-* A colorless liquid, d 0 893, m −16, b 158 *β- 2*-Allylpiperidine White needles, d 0 852, m 40 b 168 *γ- 1 2 3 4*-tetrahydro-*6*-propyl pyridine Colorless liquid, d 0 872, m −50, b 172 *δ-* Piperolidine *ε-* Methylconidine Colorless liquid, d 0 8856, b 151

conicic acid Conic acid

conicine Coniine

Coniferae Pinales, pine family A group of trees or shrubs, usually with a resinous juice and awl or needle shaped leaves, which bear cones It includes the old families Pinaceae and Taxaceae

coniferaldehyde Ferulaldehyde

coniferin $C_{16}H_{22}O_8\,2H_2O$ = 378 2 A glucoside from the cambium of coniferous trees and asparagus A grayish-white powder m 185, soluble in hot water, slightly soluble in alcohol Used for the manufacture of vanillin It hydrolyses to glucose and coniferol

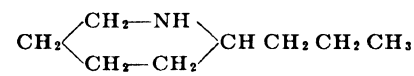
coniferol $C_{10}H_{12}O_3$ = 180 1 Coniferyl alcohol, m-methoxy-p-oxystyrone Colorless crystals, m 73, slightly soluble in water It oxidizes to vanillin Cf *lignin*

coniferyl The radical HO (MeO)C_6H_3CH CH— **c alcohol** Coniferol **c aldehyde** Feruladehyde **c benzoate** $C_{17}H_{16}O_4$ The chief constituent of Siamese gum benzoin colorless needles, m 72 8

conic acid Conicic acid An acid constituent of conium

conine Coniine

coniine $C_8H_{17}N$ = 127 2 Cicutine, d-alpha-propylpiperidine, 2-propylpiperidine, conine



An alkaloid from the seeds of *Conium maculatum*, poison hemlock an Umbelliferæ A yellow, oily narcotic liquid, d 0 862, m −2 5, b 166, insoluble in water, miscible with alcohol or ether Cf *arthusine, conhydrine* **hydroxy-** Conhydrine **para-** Paraconine

c hydrobromide $C_8H_{17}N\,HBr$ = 208 01 White crystals, m 210, soluble in water, alcohol or chloroform, used as an antispasmodic and antineuralgic **c hydrochloride** $C_8H_{17}N\,HCl$ = 163 66 Colorless rhombic crystals, m 210–212, soluble in water or alcohol, insoluble in ether

conium The seeds of *Conium maculatum*, poison hemlock, an Umbelliferae Used as a narcotic and sedative, as a fluid extract or tincture Cf *conine, conamarine*

conjugate Paired or coupled **c double bonds** Two double bonds in the relative positions indi-

cated by the formula —CH=CH—CH=CH—
4 3 2 1
They form additive compounds by saturation of the 1 and 4 carbons, so that a double bond is produced between the 2 and 3 carbons **c foci** The anterior and posterior foci of a lens **c proteins** Polypeptides or proteins which contain, in addition to amino acids, some other organic substance (prosthetic group), as,

conjugated protein	*prosthetic group*
hemoglobin	hematin
chlorophyll	ethiophyllin
nucleoproteins	nucleic acids
phosphoproteins	phosphoric acid
glycoprotein	chondroitin

conjugation (1) The linking together of centers of unsaturation, as in conjugate double bonds (2) The combination of large molecules (*e g*, proteins, polysaccharides) with some other compound

consecutive Following one another in an uninterrupted sequence or order **c position** Adjacent position

conservation The preservation or protection from loss, decay, or deterioration **c of energy** The principle that no energy is ever created or lost, but is always transformed into some other form of energy Cf *mass-energy cycle* **c of matter** The principle that no matter is ever created or lost but is always transformed into some other form of matter, *e g*, the radioactive elements disintegrate, but form elements of lower atomic weight

conservative Preservative

consistence The viscosity or solidity of a fluid

consistency (1) The degree of solidity or fluidity Cf *dissipation, penetration* (2) The percentage of solid matter in a mixture (*E g*, of pulp) **c meter** A device for determining the solidity of a semi-solid or syrupy substance, *e g*, gelatin, syrup, oils It consists usually of a disk rotat-

PRIMARY CONSTANTS (by definition)

Quantity	*Symbol*	*Value*	*Error* $\times 10^x$
Atomic weight of oxygen	O	= 16 000	
Length of one meter	m	= 100 cm	
Mass of one cc water at 4°C	gm	= 1 0000	
Density of water at 4°C	d_4°	= 1 0000	
Temperature of freezing water at 1 atm		0°C	
Temperature of boiling water at 1 atm		100°C	
Normal atmospheric pressure		760 mm Hg of d 13 5951	

BASIC CONSTANTS (by observation)

Velocity of light	c	= 2 99796 $\times 10^{10}$ cm sec $^{-1}$	± 00004
Gravitational constant	G	= 6 664 $\times 10^{-8}$ cm^{3}g^{-1} sec $^{-2}$	± 002
Electronic charge	e	= 4 770 $\times 10^{-10}$ e s u	± 005
	e/c	= 1 5910 $\times 10^{-20}$ e m u	± 0016
Electronic ratio	e/m	= 1 761 $\times 10^{7}$ e m u g^{-1}	± 001
	(e/m)c	= 5 279 $\times 10^{17}$ e s u g^{-1}	± 003
Faraday	F	= 9 6494 $\times 10^{4}$ coulombs	± 00005
Volume of 1 mole gas at 0°C and normal atmosphere	v_0	= 22 4141 $\times 10^{3}$ cm^3 mole^{-1}	± 0008
Absolute zero (ice-point)	T_0	= 273 18	± 03°K
Planck's constant	h	= 6 547 $\times 10^{-27}$ erg sec	± 008
Rydberg wave number	R_∞	= 109737 42 cm^{-1}	± 06

DERIVED CONSTANTS (by deduction)

Avogadro's number	N_0	= 6 064 $\times 10^{23}$ mole^{-1}	± 006
Loschmidt's number	n_0	= 2 705 $\times 10^{19}$ cm^{-3}	± 003
Gas constant	R_0	= 8 3136 $\times 10^{7}$ erg deg^{-1} mole^{-1}	± 001
	R_0'	= 1 9864 cal deg^{-1} mole^{-1}	± 0004
	R_0''	= 8 246 $\times 10^{-2}$ liter atm deg^{-1} mole^{-1}	± 0009
	R_0'''	= 82 048 cm^3 atm deg^{-1} mole^{-1}	± 009
Molecular gas constant	k_0	= 1 3708 $\times 10^{-16}$ erg	± 0014
Mass of hydrogen atom	m_H	= 1 6608 $\times 10^{-24}$ g	± 0017
Mass of electron	m_0	= 8 994 $\times 10^{-28}$ g	± 014
Mass of electron (*spectroscopic*)	m_0	= 9 035 $\times 10^{-28}$ g	± 010
Mass of alpha particle	m_α	= 6 597 $\times 10^{-24}$	± 007
Distance nucleus to electron (*normal H*)	a_0	= 0 5284 $\times 10^{-8}$ cm	± 0004
Radius of Bohr (K) orbit (*normal H*)	a_0'	= 0 5281 $\times 10^{-8}$ cm	± 0004
Speed of electron (*normal H*)	v_0	= 2 1824 $\times 10^{8}$ cm sec^{-1}	± 0017

CONVENTIONAL CONSTANTS

Atmosphere, normal	A_n	= 1 013250 $\times 10^{6}$ dyne cm^{-2}	
Aberration constant		20 47″	
Wavelength of red Cd line	λ_{Cd}	= 6438 4696 Å	
Gravity constant, normal	g	= 980 665 cm sec^{-2}	

EXPERIMENTAL CONSTANTS

Atomic weight of hydrogen	H	= 1 0078	
Grating space in calcite		3 028 A	
Liter	1	= 1000 027 cm^3	
Gram calorie (mean)	cal_m	= 4 186 joule	
British Thermal Unit (mean)	B Th u	= 1054 8 joule	
International Ohm		1 00052 absolute ohm	± 00002
International Ampere		0 99995 absolute amp	± 00005

ing in the substance and driven by a constant force

consistometer An apparatus for determining the hardness or consistency of semi-liquids, and hard, brittle, bituminous materials It consists essentially of a plunger dropping at a constant speed and force on to the material to be tested, the depth of penetration is measured

consolute (1) Any liquid or solution which is completely miscible with another liquid or solution (2) Miscible in all proportions

constant (1) That which is unchangeable, permanent or invariable (2) In physics a property which remains numerically the same, and which may serve as a unit of measurement (3) In mathematics a quantity having a definite and fixed value **basic-** The numerical value of a permanent property which can be directly determined **cell-** Specific resistance **conventional-** The numerical value of a physical property which is generally accepted as normal **derived-** The numerical value of an unchanging physical property which is indirectly determined **experimental-** The numerical value of a physical property determined by experiment and accepted as standard See table

c proportion A fundamental law of chemistry Every chemical compound always contains the same percentage by weight of its constituent elements (Proust)

constantan Constantin

constantin Constantan An alloy of 60 % copper and 40 % nickel, d 8 4, m 1290, used in thermocouples

constellation The configuration or arrangement of electrons in a molecule which gives rise to certain properties, as in chromophore, fluorophore, pharmacophore, toxophore, osmophore and glucophore Cf *resonator*

constituent (1) Any one of the elements or parts of a compound (in contradistinction to the ingredients or *components* of a mixture) (2) Elements or compounds present in a system which are formed from the components (q v), thus, in the system

$$CaCO_3 = CaO + CO_2$$

there are three *constituents* ($CaCO_3$, CaO and CO_2), but only two *components*, as any two substances will determine the amount of the third

constitution The structure in which the elements are linked together or arranged in a material, *e g* , we do not know the *constitution* of glass, but we know its *composition* Cf *configuration*

constitutional formula See *formula*

contact (1) The touching of two or more bodies (2) An electric switch **c action** Catalysis **c difference** Contact-potential **c -key** An electrical switch **c potential** The difference in potential of two metallic plates produced by their close contact **c process** The catalytic manufacture of sulfuric acid from sulfur dioxide and oxygen **c series** Electromotive series **c substance** Catalyst

container See *shipping, storage*

contamination Infection occurring through contact, *e g* a bacterial culture is intentionally *infected* with bacteria when inoculated, but *contaminated* accidentally when another spore or mold develops in the culture

contoured An irregular, smooth, undulating surface like that of a relief map, used to describe bacterial cultures

contractile Capable of being drawn together

contraction (1) In chemistry The drawing together of atoms in the molecule depending partly upon their mutual electromotive forces The contraction (C) is expressed by $[100 - (100M/A' - A'' \quad)]$, where M is the molecular volume, A', A'', etc , the atomic volumes of the constituents Thus C for the oxides of Na = 55 0, K = 61 0, Rb = 59 8, Cs = 58 4 (2) In physiology The shortening of muscles in response to a stimulus

contramin $C_9H_{22}N_2S_6$ = 322 1 Diethylammonium diethylthiocarbamate, $NEt_2\,CS\,SNH_2Et_2$ A softener of fibrous tissue used in the treatment of chronic infections

contrast A comparison of two things by accentuating their points of difference **c stain** A double stain, in which the special feature to be examined takes one color, all else another color

contravalence Covalence

control A blank test or standard, *e g* , an experiment performed simultaneously with another experiment in order to study the relative effects of different factors or conditions

conus Cone

convallamaretin $C_{20}H_{36}O_8$ = 404 4 A decomposition product of convallamarin

convallamarin $C_{23}H_{44}O_{12}$ = 512 4 A glucoside from *Convallaria majalis*, lily of the valley, a Liliaceae A slightly yellow amorphous powder, soluble in water or alcohol, used as a cardiac stimulant and diuretic, as it increases arterial pressure similarly to digitalis

CONVERSION FACTORS

LENGTH	cm × 0 3937 = inches	inch × 2 540 = cm
	cm × 0 0328 = feet	foot × 30 48 = cm
	m × 3 280 = feet	foot × 0 305 = m
	m × 1 093 = yards	yard × 0 914 = m
	km × 0 621 = miles	mile × 1 609 = km
AREA	sq cm × 0 155 = sq inches	sq in × 6 452 = sq cm
	sq m × 10 764 = sq feet	sq feet × 0 093 = sq m
	sq m × 1 196 = sq yards	sq yard × 1 672 = sq m
	sq km × 0 386 = sq miles	sq miles × 2 59 = sq km
VOLUME	cc × 0 061 = cb inches	cb inch × 16 387 = cc
	cc × 0 0338 = Apoth fluid ounces	Ap fluid ounce × 29 574 = cc
	1 × 1 0567 = quarts	quart × 0 946 = liters
	1 × 0 2642 = U S gallons	gallon × 3 785 = liters
WEIGHTS	g × 15 432 = grain	grain × 0 0648 = gm
	gm × 0 03527 = Av ounces	Av ounce × 28 349 = gm
	gm × 0 03215 = Ap ounces	Ap ounce × 31 103 = gm
	kg × 2 2046 = Av pounds	Av pound × 0 4536 = kg
	kg × 2 6792 = Ap pounds	Ap pound × 0 3732 = kg

convallaretin $C_{14}H_{26}O_3$ = 242 2 A resinoid from convallaria, used as an emetic

Convallaria Lily of the valley The flowers and roots of *C majalis*, used medicinally as an antispasmodic, sternutatory, and diuretic

convallarin $C_{34}H_{62}O_{11}$ = 646 6 A glucoside from the root of Convallaria Colorless rectangular prisms, or amorphous yellowish powder, sparingly soluble in water, soluble in alcohol, used as a purgative

convection The transmission of heat by the rise of heated liquids or gases, and the fall of colder parts of liquid or gas which in turn become heated, hence, the currents or streams of liquids or gases set up in an unequally heated container

convergent Inclining towards each other or coming together at one point

conversion (1) The change from one isomer to another isomeric molecule (2) The change from one unit or system of measurement to another unit or system of measurement **c factor** A numeral by which a quantity must be multiplied in order to express that quantity in other units

converter A device used for changing (1) energy, or (2) matter into another form, as, (1) phase-c , or (2) a digester

convex A rounded or bulging exterior surface, opposed to concave **c lens** See *lens* **c mirror** See *mirror*

convicin $C_{20}H_{28}O_{16}N_8$ = 608 24 A hexose glucoside of pyrimidine, in *Vicia* species

Convolvulaceae A family of twining or trailing herbs, some of which have a milky juice

Exogonium purga	jalap
Exogonium turpethum	turpeth
Ipomoea hederacea	kaladana
Ipomoea orizabensis	ipomoea
Ipomoea simulans	tamicin
Ipomoea pandurata	convolvulus
Convolvulus scammonia	scammony

convolvulin $C_{31}H_{50}O_{16}$ = 678 5 Rhodeorhetin A glucoside from jalap A yellow amorphous mass, soluble in alcohol or chloroform, used as a drastic purgative

convolvulinic acid $C_{18}H_{30}O_3$ = 258 3 The acid $Me(CH_2)_8CHOH(CH_2)_9COOH$, obtained from jalap resin Colorless crystals, m 50

convolvulinolic acid Convolvulinic acid

convolvulus The root of *C panduratus*, man root, a Convolvulaceae of North America, used as a diuretic and laxative

convulsant A drug which causes convulsions

conydrine Conhydrine

conylene C_8H_{14} = 110 10 1 4-octadiene A hydrocarbon derived from azoconhydrine

conyrine $C_8H_{11}N$ = 121 09 α-propyl pyridine Colorless crystals, m 167, obtained by the reduction of conine with zinc dust

Cook formula The acetyl number (q v) A, is given by $A = \frac{S' - S}{1 - 0\ 00075S}$, where S and S' are the saponification values before and after acetylation

Coolidge, William David 1873– An American physical chemist, noted for his development of x-ray devices **C tube** (1) A modified x-ray tube in which the cathode is a tungsten spiral enclosed in a molybdenum tube The quality of the x-rays depends on the electrically heated cathode (2) Electron tube A modified cathode tube with a thin nickel window and a cathode consisting of a wire made incandescent by a secondary electric current On passing a high voltage across the highly evacuated tube, a stream of electrons will pass out of the window and produce effects similar to the β-rays of radium

cooling To deprive of heat, as, freezing, refrigeration **air- C** by means of air currents **water- C** by means of a stream of cold water

Cooper Hewitt lamp An incandescent mercury vapor lamp consisting of an exhausted glass tube, 3–4 feet long, which contains a small quantity of mercury and to which is applied an electric potential

cooperite A native platinum sulfarsenide containing 64 % Pt and 9 % Pd

coordinate Related to one another **c bond** See *bond* **c paper** A sheet of paper ruled with horizontal and vertical lines, used in drawing graphs and curves **c valence** See *bond valence*

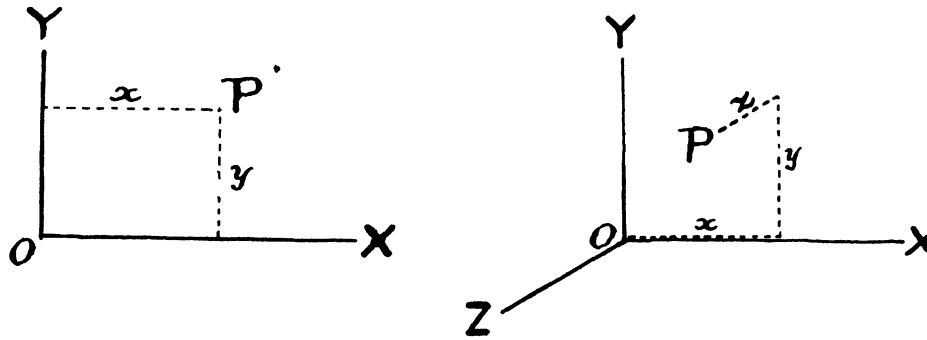
coordinates Any system by which the position of a point, particle, object or star is defined by reference to base-lines or base-planes Cf *diagram, abscissa, ordinate*

A *Rectangular* c (*Cartesian* c) give the distances, x, y, of point P, from each of two or three perpendicular lines or planes, YOX, XOZ, ZOY

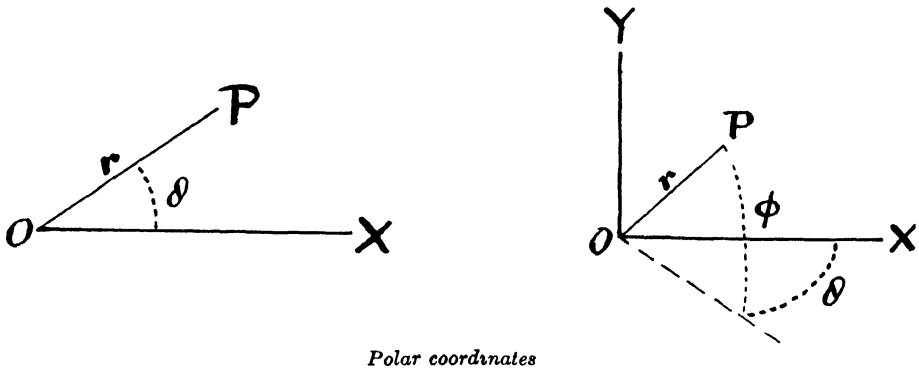
B *Polar* c give the distance, r, from the origin, O, with the angle, θ, or the latitude and longitude, θ and ϕ, on a sphere of radius r

C *Vector* c A straight line in a definite direction, P, and of definite length, r

coordination The harmonious working together of parts of the same rank or order **c number** The valence number of the central atom of addition compounds, indicating the number of molecules or atoms held by that atom Carbon and related elements have a maximum of four, all other elements have generally a c number

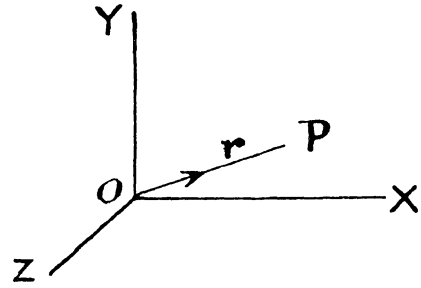


Rectangular coordinates



Polar coordinates

of six Thus $[PtX_6]R_2$ or $[CrX_6]R_2$, where X may or may not be the same radical as R, the latter is usually a monovalent radical, while X is Br, Cl, CN, SCN, NO, NO_2, NH_3 or H_2O Cf *Werner's theory*



Vector coordinates

copahene $C_{20}H_{17}Cl$ = 302 7 Colorless crystals insoluble in water

copahin A resinoid from copaiba balsam

copahuvic acid Copaivic acid

copaiba Balsam of copaiba, copaiva An oleoresin from various leguminous trees of tropical America, especially *Copaifera officinalis* Grades **Bahia-** refr index 1 508, acid val 110–150 **Maracaibo-** refr ind 1 517, acid value 120–160 **Maranham-** refr ind 1 515, acid value 140–170 **mixture-** q v **Para-** refr ind 1 510, acid value 100–160 Insoluble in water used as a stimulant, diuretic, and laxative

c oil An essential oil distilled from c , d - 0 895–0 905, b 250–275, it contains sesquiterpenes **c resin** The residue remaining after distillation It consists mainly of copaivic acid

copaiva Copaiba

copaivic acid $C_{20}H_{30}O_2$ = 302 3 Copahuvic acid A monobasic acid derived from the resin of copaiba

copals A group of hard resins from East Indies, South America and Africa, consisting of the exudations of various trees, they are used principally in varnish manufacture **East African-** Animi resin **fossil-** C found in the ground at places where the trees yielding it have disappeared This is the best and highest-priced c **fresh-** Inferior c gathered from living trees **kauri-** Kauri gum **Manila-** See *Manila* **semifossil-** Copal collected from the ground near living trees

c balsam Liquid ambar

copalchi The barks of *Strychnos pseudoquina*, *Croton niveus*, and other South American trees, used as a febrifuge

copalin Kopalin The resin which exudes from the sweet-gum tree, *Liquidambar styraciflua*

copel An alloy of 55 % copper and 45 % nickel, used in thermocouples

copellidine $C_8H_{17}N$ = 127 15 aa1-copellidine, 2-ethyl-6-methyl-piperidine An artificial alkaloid, derived from piperidine

copernik An alloy of equal parts iron and nickel

copiapite Yellow copperas The native compound $Fe_4S_5O_{18} + H_2O$

copis A white transparent shell from the Philippine Islands, used extensively in the manufacture of screens, windows, lamps, etc

Coplin jar A box-like glass vessel with inside perpendicular grooves for holding microscopical slides apart during staining

copper (1) Cu = 63 57 Cuprum A metallic element, atomic number 29 An orange-colored, ductile, malleable metal, d 8 90, m - 1083, b 2840, insoluble in water, dissolved by nitric acid It occurs in nature as metallic copper, oxide (cuprite), sulfide (copper-glance, chalcopyrite), or carbonate (malachite, etc), and was known in prehistoric times (copper age) It is prepared or refined by electrolysis of crude copper in copper sulfate solution Copper is mono- and di-valent, and forms two series of compounds

+1 cuprous compounds, *e g* , CuCl
+2 cupric compounds, *e g* , $CuCl_2$

The cupric compounds are more stable than the cuprous compounds, they are blue when hydrated, and white or grayish when anhydrous, they are poisonous and ionize in aqueous solution Metallic copper is used extensively for wires, plates, coins, utensils, etc and is a constituent of many alloys (brass, bronze, bell metal, gun metal, etc) (2) A general term suggested for alloys containing 98 % or more of copper **black-** Cupric oxide **blue-** A native c sulfide **indigo-** Covellite **peacock-, purple-** Dornite **rose-** See *rosette* **scale-** C in thin flakes **silicon-** An alloy of 70–80 % Cu and 30–20 % Si **wood-** Olivenite **yellow-** Chalcopyrite

c aceto arsenite Paris green **c alloys** See table **c ammonium chloride** See *cupric ammonium chloride* **c arsenite** See *cupric arsenite* **c beaker.** A copper beaker or cup used in the laboratory **c blue** Azurite **c. bromide** See *cuprous, cupric* **c carbonate** Verditer A native blue or green copper

COPPER ALLOYS

Cu	90 %	80 %	70 %	60 %	50 %
With	10 %	20 %	30 %	40 %	50 %
Ag	1035°	990°	945°	910°	870°
Al	1055°(a)	930°	755°	610°	580°
Au	1060°	1025°	1000°	975°	925°
Ni	1180°	1240°(d)	1290°	1320°(h)	1335°
Pb	1020°	1005°	985°	955°	950°
Sn	1005°(b)	890°(e)	755°(f)	725°	680°
Zn	1040°(c)	995°(j)	930°(g)	900°(i)	880°

a = aluminum bronze
b = bronze, gun metal
c = brass
d = nickeline
e = bell metal
f = speculum metal
g = yellow brass
h = constantan
i = Muntz metal
j = Dutch metal

carbonate Cf *Bremen basic-* See *cupric c* **c chloride** See *cupric, cuprous chloride* **c crucible** A small crucible of copper **c flask** A 1000-cc flask used in Kjeldahl determinations **c froth** Tyrolite A native copper arsenate **c funnel** A funnel made of copper, used in pharmaceutical laboratories **c green** A native pigment of lead chromate and c oxide **c lazur** Azurite **c minerals** The chief ores of copper are native copper, sulfides, oxides and carbonates

native copper	Cu
chalcocite	Cu_2S
covellite	CuS
chalcopyrite	$CuFeS_2$
chalmersite	$CuFe_2S_3$
cubanite	$CuFe_2S_4$
bornite	Cu_3FeS_4
carrollite	$CuCo_2S_4$
berzelianite	Cu_2Se
umangite	Cu_3Se_2
rickardite	Cu_4Te_3
weissite	Cu_5Te_3
domeykite	Cu_3As
algodonite	Cu_6As
whitneyite	Cu_9As
horsfordite	Cu_5Sb
enargite	Cu_3AsS_4
famatinite	Cu_3SbS_4
tennantite	$Cu_3As_2S_7$
tetrahedrite	$Cu_3Sb_2S_7$
klaprotholite	$Cu_6Bi_4S_9$
emplectite	$CuBiS_2$
bournonite	$CuPbSbS_3$
cuprite	Cu_2O
tenorite	CuO
nantokite	CuCl
chalcanthite	$CuSO_4\ 5H_2O$
brochantite	$Cu_4SO_4(OH)_6$
malachite	$Cu_2(OH)_2CO_3$
azurite (chessylite)	$Cu_3(OH)_2(CO_3)_2$
chrysocolla	$CuSiO_3\ 2H_2O$
dioptase	CuH_2SiO_4

c mordant Cupric sulfate or cupric acetate **c number** The number of milligrams of copper obtained by the reduction of Fehling's or Benedict's solution by one gram of a carbohydrate **c orthosilicate** Dioptase Chrysocolla **c peroxide** Cu_2O_3 and $CuO_2\ H_2O$ A yellow powder, decomp in water **c phosphide** See *cuprous p* and *cupric p* Cu_5P_2-H_2O also exists **c shavings** Small shavings of metallic c , used as a catalyst and in preparing cuprammonium reagent **c silicide** Cu_2Si A gray powder **c sulfate** Cupric sulfate **c vitriol** Cupric sulfate **c wire** A wire of metallic c , used extensively as an electric conductor

copperas A native, crystalline ferrous sulfate, $FeSO_4$ **blue-** Cupric sulfate **green-** Ferrous sulfate **yellow-** Copiapite **white-** Zinc sulfate

copperon Cupferron

Coppet, Louis Cas de 1841–1911 A French physicist **C's law** The reduction in the freezing point of a solution is proportional to the amount of dissolved substance Cf *Raoult's law*

copra The dried kernels of the coconut, from which coconut oil is expressed

cupraol A fat obtained from coconut oil

coprecipitation See *precipitation*

coprolite The fossil dung of prehistoric animals and a source of phosphates and fertilizers (25–30 % P_2O_5) Rounded lumps, 2-8 ins in diameter occurring in small deposits throughout the world

coprophilia A group of bacteria living in feces and dung

coproporphyrin The coloring matter of bottom-fermentation yeasts

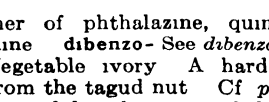
coprostanol Coprosterol

coprosterol $C_{27}H_{48}O$ = 388 37 Dihydrocholesterol, stercorol, coprostanol A saturated alcohol from feces, colorless crystals, m 98 Cf *cholane derivatives*

copro-yeast See *yeast*

coptine A colorless, crystalline alkaloid from *Coptis trifolia*, golden thread, a Ranunculaceae

copyrine $C_8H_6N_2$ = 130 06 2 7-pyridopyridine, 2 7-benzodiazine (q v) The heterocyclic compound,



an isomer of phthalazine, quinazoline, and quinoxaline **dibenzo-** See *dibenzocopyrine*

corajo Vegetable ivory A hard, white substance from the tagud nut Cf *phytelephas*

coral The solid calcareous skeletons of the coral animal, *Polyps anthozoa*, it consists chiefly of calcium carbonate colored by ferric oxide **c bean** Sophora **c root** Crawley The root of *Corallorhiza odontorhiza*, an Orchidaceae, a powerful diaphoretic

corallin (1) Peonin, aurine R A coloring matter and dye derived from rosolic acid, insoluble in water, soluble in alcohol or ether Used as a reagent and dye (2) A pigment found in *Streptothrix* species **c solution** A solution of 1 pt c in 10 pts alcohol and 90 pts water It is an indicator for ammonia and weak bases, (alkalis—red, acids—yellow) **c yellow** Sodium rosolate

corallinate Rosolate

coralline (1) Corallin (2) Rosolic acid

corallite Carrolite

coramine Nikethamide A pyridine derivative used as cardiac stimulant

corbefrin Cobefrin

corbyn A glass bottle of 1200 cc capacity, and shaped like a winchester (q v)

cord A unit in the volumetric measurement of wood as logs The volume occupied by an orderly pile of logs 8 feet long, 4 feet wide and 4 feet high, the logs being laid as near parallel to the ground and to one another as possible It has therefore a maximum value of 128 cu ft (3 625 cu m), but is more usually 90 to 95 cu ft of solid wood because of the spaces between the logs Cf *cunit, board foot, fast meter*

cordein Methyl *cordol*

cordial (1) An elixir (2) A liqueur

cordierite Iolite

cordite A smokeless, sporting powder consisting of 30–58 % nitroglycerin, 65–37 % nitrocellulose and 5–6 % mineral jelly

cordol $C_6H_4OH\ COOC_6H_2Br_3$ = 450 82 Tribromsalol A white, tasteless and odorless powder, insoluble in water, alcohol, or ether, soluble in chloroform or acetic acid, used as an intestinal antiseptic and hemostatic **acetyl-** Cordyl, acetyltribromsalol Fine, white needles Analgesic, hypnotic, intestinal antiseptic and antispasmodic **methyl-** Cordein methyltribromsalol Colorless needles Antiseptic and analgesic

cordyl Acetyl *cordol*

core The central part, *e g* , the iron rod of an induction coil

coreductase The co-enzyme of reductase, q v

coregonin A protamine from *Coregonus albus*, white fish

coriaceous Describing a tough, leathery growth of bacteria

coriamin A 25 per cent aqueous solution of pyridine-β-carbonic acid diethylamide, NC_5H_4-$CON(C_2H_5)_2$

coriamyrtin $C_{30}H_{36}O_{10}$ = 556 3 A glucoside from the leaves, flowers, and seeds of *Coriaria myrtifolia*, or curriers sumach, a Coriariaceae Colorless crystals, m 220, sparingly soluble in water, soluble in alcohol or ether, it is a tetanic poison resembling picrotoxin in action

coriander The seeds of *Coriandrum sativum*, an Umbelliferae, used as an aromatic, carminative, and spice **c oil** The essential oil from coriander, d 0 863–0 875, containing linalol and pinene, used as a flavoring agent

coriandrol Linalool

coriarine An alkaloid from *Coriaria myrtifolia* Cf *coriamyrtin*

coridine $C_{10}H_{15}N$ = 149 1 An aniline derivative obtained by the distillation of animal matter, *e g* , bones It is a homolog of pyridine **hydro-** Hydrocoridine

cork Suber (1) The exterior layers of the bark beneath the epidermis of certain oaks, obtained from *Quercus suber* and *Qu occidentalis* See *cerin, corticinic acid, phellonic acid, suberic acid suberin* (2) A stopper made from cork **c. borer** A set of metallic tubes for boring holes in cork stoppers **c press** A device for pressing and softening cork stoppers **c tongs** A pair of tweezers for making cork stoppers more elastic or soft

corm A thickened underground stem of a plant that has the character of a tuber and bulb There is only one official corm (sometimes erroneously termed radix), namely, colchicum

corn (1) A general term for the grain-producing grasses, or cereals (2) Maize (3) A hard mass of tissue **Indian-** Maize **c oil** Oil of *maize* **c silk** The stigmas of maize, used as a diuretic as a fluid extract **c sirup** Glucose **c spar** A crystalline variety of calcite **c starch** See *starch* **c sugar** *d*-Glucose

cornelian A bright red variety of chalcedony

Cornet forceps Nickel plated spring forceps to hold cover glasses

cornflower Blue bottle The blossoms of *Centaurea cyanus*, a Compositae containing cyanidin, a blue pigment Cf *anthocyanin, flavones*

cornic acid Cornin

cornification Rendering hard and brittle by drying

cornin Cornic acid A crystalline substance from the bark of *Cornus florida*, or dogwood, a Cornaceae Cf *cornuol*

cornine An alkaloid from *Cornus florida*, used as an antiperiodic and tonic

Corning filter (1) In general a glass filter plate made by the Corning Co for isolating light of a particular wavelength (2) In particular a filter for isolating ultraviolet light

cornstone Impure clay containing limestone

Cornu prism A quartz prism composed of two 30° angle right and left quartz prisms in optical contact It refracts light Cf *Littrow prism*

cornuoid The combined principles from the bark of *Cornus florida*, the Florida dogwood, used as a tonic, antimalarial, and febrifuge

cornutine An alkaloid of ergot **c citrate** The citrate of cornutine, used medicinally for spermatorrhea

cornutol A liquid extract of ergot containing the water- and alcohol-insoluble constituents

coromegine Atropine

corona (1) A crown or crown-like structure (2) The incandescent gases which surround the sun, and are seen during total eclipses Its light is partly polarized and yields unknown bright lines, and continuous or Fraunhofer spectra **c discharge** The corona produced at the electrodes during an electrical discharge at a high voltage (see *Cottrell precipitator*) **c spectrum** The spectrum of the corona of the sun, which is a reversed spectrum showing prominent and luminous Fraunhofer lines

coronillin $C_7H_{12}O_5$ = 176 1 A glucoside from the seeds of *Coronilla scorpioides*, a Leguminosae A yellowish powder, soluble in water, acetone or amyl alcohol, slightly soluble in alcohol, ether, or chloroform It is a cardiac poison, used as a diuretic and heart stimulant

coronium Protofluorine A hypothetical element discovered in the spectrum of the corona of the sun, but not yet found on the earth's surface Its spectrum is thought to be due to forbidden lines of oxygen

corporin Progesterone

corpse light The blue flame inside the miners' safety lamp, which indicates the presence of fire-damp (methane)

corpus (1) The body (2) The main part of an organ (3) A dried organ, used therapeutically **c ciliariae** An extract of the ciliary or vitreous body Used in ophthalmia **c luteum** The dried substance from the corpora lutea removed from the ovaries of cows or hogs, dried and powdered without the addition of preservatives or diluents It is a yellowish powder, slightly soluble in water and used in ampule medication It contains several hormones, *e g*, progesterone, relaxin Cf *lutein, ovarian substance*

corpuscle (1) A small or minute particle (2) A free electron **blood-** See *blood* **light-** See *photon* **negative-** See *electron* **positive-** See *proton*

correlation A reciprocal relationship, interdependence **c coefficient** The quantity $\sqrt{(1 - p^2)/(n - 1)}$, where n is the number of values obtained for a given determination, and p is the true value

correspondence principle The relation existing between the different orbits of an electron in an atom and the characteristic radiation Cf *Bohr's theory, Pauli's principle*

corresponding state The assumption that if the pressure, volume and temperature is expressed for each substance (whether solid, liquid or gaseous) by the critical constants P_c, V_c, and T_c, then the (Van der Waal's equation) equation of state will hold for all substances, in the liquid or gaseous state, for they will then correspond **c temperatures** Those temperatures of two or more substances which are equal fractions of the critical temperatures

corrigent A drug which favorably modifies or corrects the action of another drug

corroborant Tonic

corrode To disintegrate slowly by chemical action

corronel An alloy of 70 % nickel and 30 % copper

corrosion A process of gradual disintegration or decomposition of a chemical nature, *e g*, of iron in acidic water, rocks in natural waters It is electrochemical in character Cf *surrosion, erosion*

corrosive (1) A drug which destroys organic tissues either by chemical means or by causing inflammation (2) Any agent that causes corrosion **c poison** See *poison* **c sublimate** Mercuric chloride

corrosives The irritant poisons, which cause local destruction of organic tissues, *e g*, acids, bases, $KClO_4$, H_2O_2, etc

corrugation The wrinkling of a part or body, *e g*, corrugated fibre board

corsite Napoleonite A variety of diorite found in Corsica It may be banded or spotted, used as an ornamental stone

cortepinitannic acid. $C_{32}H_{34}O_{17}$ = 690 2 A bright red powder from the bark of Scotch fir, *Pinus sylvestris* Cf *pinicortannic acid*

cortex The bark of a tree, root, or fruit

corticin A tannin from bark of trees

corticole A group of lichens

corticotrophin The active principle of the anterior lobe of the pituitary gland which acts on the adrenal cortex

cortin $C_{20}H_{30}O_5$(?) A hormone from the suprarenal cortex which increases muscular efficiency and maintains growth

corticinic acid $C_{13}H_{10}O_6$ = 250 08 A colorless crystalline substance obtained from cork

corundum α-Alumina Oriental topaz A hard native or artificial aluminum oxide, used as an abrasive and refractory *Emery* is impure c , for native colored varieties see *adamantine, hyacinth, sapphire, oriental c*

coruscation The emission of sparks or flashes

corybulbine $C_{21}H_{25}O_4N$ = 355 20 An alkaloid from *Corydalis cava,* colorless crystals, insoluble in water

corycavamine $C_{21}H_{21}O_5N$ = 367 16 An alkaloid from *Corydalis cava*

corycavine $C_{23}H_{23}O_6N$ = 409 20 An alkaloid from *Corydalis cava,* m 218

corydaline $C_{22}H_{27}O_4N$ = 369 22 An alkaloid from *Corydalis cava* and *C tuberosa,* holewort, a Fumariaceae Colorless crystals, used medicinally as a tonic, alterative, and diuretic

corydalis Turkey corn, holewort The root of *C cava* (*Bulbocapnus cavus*), a Fumariaceae Used for menstrual disorders, as a malarial tonic and vermifuge It contains a number of isoquinoline alkaloids, as corydaline, bulbocapnine, corydine, and fumarine

corydine $C_{21}H_{23}O_4N$ = 353 18 An alkaloid from *Corydalis cava*

corylin A globulin from hazel nuts

corymin $C_{50}H_{100}O_4$ = 764 7 A hydroxy acid, m 70, from the fat of the diphtheria bacillus

corynine Yohimbine

corytuberine $C_{19}H_{23}O_4N$ = 329 17 An alkaloid from *Corydalis cava*

cosanates A group of salts or esters derived from fatty acids, with 20 to 29 carbon atoms, as

eicosanate	$C_{19}H_{39}COO—$
heneicosanate	$C_{20}H_{41}COO—$
docosanate (behenate)	$C_{21}H_{43}COO—$
tricosanate	$C_{22}H_{45}COO—$
tetracosanate	$C_{23}H_{47}COO—$
pentacosanate	$C_{24}H_{49}COO—$

cosanic acids A group of fatty acids with 20 to 29 carbon atoms, as

eicosanic acid	$C_{20}H_{40}O_2$	m 76°C
heneicosanic acid	$C_{21}H_{42}O_2$	m 75°C
docosanic (behenic) acid	$C_{22}H_{44}O_2$	m 81°C
tricosanic acid	$C_{23}H_{46}O_2$	m 80°C
tetracosanic (cerosic) acid	$C_{24}H_{48}O_2$	m 85°C
pentacosanic acid	$C_{25}H_{50}O_2$	m 84°C
hexacosanic acid	$C_{26}H_{52}O_2$	m 89°C
heptacosanic (cerotic) acid	$C_{27}H_{54}O_2$	m 89°C

cosanols A group of aliphatic alcohols of the methane series with 20 to 29 carbon atoms, as

eicosanol	$C_{20}H_{42}O$	m 65°C
heneicosanol	$C_{21}H_{44}O$	m 68°C
docosanol	$C_{22}H_{46}O$	m 70°C
tricosanol	$C_{23}H_{48}O$	m 74°C
tetracosanol	$C_{24}H_{50}O$	m 76°C
pentacosanol	$C_{25}H_{52}O$	m 78°C

cosaprin Sodium acetsulfanilate

cosine The ratio of the base to the hypotenuse of a right-angled triangle is the cosine of the angle subtended by these two sides

cosmetic. A pharmaceutical preparation (powder, lotion, or cream) which tends to preserve, restore, or simulate beauty

cosmic Pertaining to the universe **c rays** Ultra-γ-rays A radiation of extremely short wavelength (around 0 0005 Å U), frequency and penetration, which reaches the surface of the earth from all directions of space (cosmos)

First noted by Gockel (1910–11) up to 4500 m height, confirmed by Hess (1912) and later by Kohlhörster (1912–14) up to 9200 m Their cosmic origin was denied by Millikan (1922), but admitted in 1925

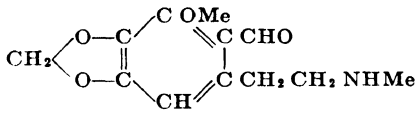
cosmin Agathin

cosyl A group of monovalent radicals derived from the methane series of hydrocarbons with 20 to 29 carbon atoms

eicosyl	$C_{20}H_{41}$—
henеicosyl	$C_{21}H_{43}$—
docosyl	$C_{22}H_{45}$—
tricosyl	$C_{23}H_{47}$—
tetracosyl	$C_{24}H_{49}$—
pentacosyl	$C_{25}H_{51}$—
hexacosyl	$C_{26}H_{53}$—
heptacosyl	$C_{27}H_{54}$—
octocosyl	$C_{28}H_{55}$—
nonocosyl	$C_{29}H_{57}$—

cotarnic acid $C_{11}H_{12}O_5$ = 224 09 A dibasic acid derived by oxidation of cotarnine

cotarnine $C_{12}H_{15}O_4N$ = 237 13 An alkaloid formed by the oxidation of narcotine It

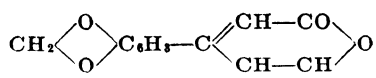


is a sedative and astringent Cf *cuprine*, *cupronine* c **hydrochloride** Stypticine c **phthalate** Styptol

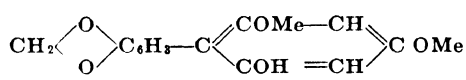
cotein $C_{22}H_{18}O_6$ = 378 15 Cotoïn A crystalline principle from coto bark, an irritant to the skin

coto The bark from a Bolivian tree Two varieties Coto verum, containing cotein, and para-coto, containing paracotoin, leucotin, cotoin, essential oil, and other constituents

cotoin $C_{14}H_{12}O_4$ = 244 09 4-methoxy-2 6 -dihydroxy-benzophenone A constituent of paracoto bark Yellow crystals, m 129, slightly soluble in cold, readily soluble in hot water Used as an irritant **hydro-** $C_{15}H_{14}O_4$ = 258 1 2 4-dimethoxy-6-oxybenzophenone, m 95 5 **para-** $C_{12}H_8O_4$ = 216 05 Dioxymethylene phenyl coumaline



An active principle from para-coto bark Yellow crystals, m 152, soluble in alcohol **proto-** $C_{16}H_{14}O_6$ = 292 11



cotonetin $C_{20}H_{16}O_5$ = 336 1 Colorless scales, isolated from coto bark

cotton (1) The hairs of the seeds of *Gossypium* species a Malvaceae, which consist of 91 % cellulose and 7 % moisture (2) A textile material spun from c fibers (3) Pyroxylin or freshly nitrated c **absorbent-** A purified and fat-free c **gun-** Pyroxylin **soluble-** Nitrocellulose **styptic-** C impregnated with ferric chloride and dried, and used to stop bleeding c **gum tree** See *gum-tree* c **oil** C seed oil c **root bark** The dried root bark of the c plant, used as an emmenagogue Cf *gossypoid* c **seed meal** The solid residue after extracting c oil, finely ground and used as cattle feed and fertilizer, it contains 6 7–7 4 % N, 1 5–2 % K and 2–3 % P_2O_5 c **seed oil** Oleum gossypii seminis The fixed oil expressed from the seeds of various Gossypium species The raw oil is a brownish yellow, somewhat viscid liquid, d 0 922 to 0 936 The refined oil is colorless or slightly yellow, of a pleasant nutty odor, $d_{15°}$ 0 9264 Used extensively in pharmaceutical preparations, and as a substitute for olive oil in the household See *Halphen's test*

cotyledon toxin An amorphous, colorless substance from *Cotyledon orbiculata*, pigs ear or honde oor, a Crassulaceae of South Africa, used in epilepsy

Cottrell, Frederick Gardner 1877– An American chemist, noted as designer of a precipitation apparatus C **precipitator** A device for the deposition of the fine particles, which constitute a fog or smoke on a series of wires which are at a different electric potential from their surroundings Used for the recovery of materials in ore-refineries, acid concentration plants, cement, coal and other industrial plants, where dust or smoke is a waste product

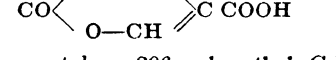
couepic acid $C_{18}H_{30}O_2$ = 278 21 ϵ-Eleostearic acid An unsaturated acid, $Me(CH_2)_3CH\ CH(CH_2)_7COOH$, from the seed-oil of *Couepia grandiflora*, a Rosaceae of South America

Coulomb, Charles Augustin de 1736–1806 A French physicist noted as a pioneer in the formulation of electrical laws C **electromagnetic law** The force between two similar magnetic poles varies inversely as the square of the distance between the poles C **electrostatic law** The force between two electrical charges varies (a) inversely as the squares of their distance apart, and (b) directly as the product of their electrical charges Hence $F = (1/K)(qq'/r^2)$, where F is the force, k a constant depending on the units used, q and q' the two charges which are a distance apart C **unit** See *coulomb*

coulomb Coul Weber A unit of electrical quantity The amount of electricity or the number of electrons transferred by a current of one ampere in one second 1 Coul = 10^{-1} e m u = $10^9 \times 3$ e s u = (Volt Sec)/Ohm = Amp /second = 1/96,489 Faraday **international-** 1 Int coul = 0 9999 absolute coul

coulometer Voltameter

coumalic acid $C_6H_4O_4$ = 140 03 2-keto-1 2-pyran-5-carboxylic acid, *2-oxo-1 2-pyran-5-carboxylic acid**



Colorless crystals, m 206 **dimethyl-** $C_8H_8O_4$ = 168 07 Isodehydracetic acid Colorless crystals, m 155

coumalin $C_5H_4O_2$ = 96 03 Cumalin 1 2-pyrone, α-pyrone Colorless liquid or crystals, m 5, b 120 **dimethyl-** $C_7H_8O_2$ = 124 05 Mesitene lactone Colorless crystals, m 51 5, b 245 **phenyl-** $C_{11}H_8PhO_2$ = 172 07 1-phenyl-a-pyrone Colorless crystals, m 68 Cf paracotoin

coumaraldehyde $C_9H_8O_2$ = 148 06 o-Oxycinnamaldehyde, coumaric aldehyde Colorless crystals m 133, sparingly soluble in water, soluble in alcohol

coumaran $C_8H_8O_3$ = 152 07 Dihydrocoumarone, 1 2-dihydro benzofuran A colorless liquid, b 189

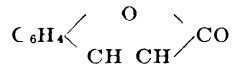
coumaranone 2(1)-Benzofuranone

coumaric acid $C_9H_8O_3$ = 164 11 Coumarinic acid An acid from the leaves of *Melilotus* **ortho-** o-hydroxycinnamic acid, o-oxycinnamic acid Colorless needles, m 208, slightly soluble in water, soluble in alcohol or ether **meta-** m-hydroxycinnamic acid Colorless prisms, m 191, sparingly soluble in hot water or ether **para-** p-hydroxycinnamic acid White needles, m 206 slighly soluble in water, soluble in alcohol or ether **acetyl-** Tylmarin **hydro-** HO $C_6H_4CH_2CH_2COOH$ = 166 13 p-hydrocoumaric acid, b-phenol-propionic acid White monoclinic crystals, m 128, soluble in water, alcohol, or ether Cf *melilotic acid* **hydroxy-** Umbellic acid

c aldehyde Coumaraldehyde **c lactone** Coumarin

coumarilic acid $C_8H_5O\,COOH$ = 162 1 1-benzofuran carboxylic acid **alpha-** Colorless crystals, m 190 **beta-** Colorless crystals **β-methyl-α-** $C_9H_7O\,COOH$ Colorless crystals, m 189

coumarin $C_9H_6O_2$ = 146 05 1 2-benzopyrone, o-hydroxy-cinnamic lactone

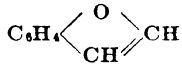


The anhydride of o-coumaric acid occurring in Tonka beans, sweet clover, and other plants, also prepared synthetically Colorless rhombic crystals, d 0 937, m 67, b 301 7, sparingly soluble in cold water, soluble in hot water, alcohol, or ether, used as a flavoring agent **6 7-dihydroxy-** Esculetin **7 8-dihydroxy-** Daphnetin **dimethyl-** $C_{11}H_{10}O_2$ = 174 1 4 7-dimethyl-1 2-benzopyrone para-beta-dimethyl-coumarin Colorless crystals, m 148 **ethyl-** $C_{11}H_{10}O_2$ = 174 1 3-ethyl-1 2-benzopyrone Colorless crystals, m 71 **7-hydroxy-** Umbelliferone **iso-** 2 1-benzopyrone Colorless crystals, m 47°C **iso-propyl-** $C_{12}H_{12}O_2$ = 188 1 3-isopropyl-1 2-benzopyrone Colorless crystals, m 54 **7-methoxy-** Herniarin **α-methyl-** $C_{10}H_8O_2$ = 160 1 3-methyl-1 2-benzopyrone Colorless crystals, m 90 **β-methyl-** $C_{10}H_8O_2$ = 160 1 4-methyl-1 2-benzopyrone Colorless crystals, m 125 **3-oxy-** $C_9H_6O_3$ = 162 1 Colorless crystals m 282 **4-oxy-** Umbelliferone **4-oxy-β-methyl-** Resocyanin **5-oxy-** $C_9H_6O_3$ = 162 1 Colorless crystals, m 249

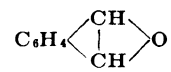
coumarinic acid Coumaric acid

coumarketone A compound containing the monovalent $C_6H_4(OH)CH\,CH\,CO$-radical **methyl-** $C_{10}H_{10}O_2$ = 162 1 o-oxy-benzalketone Colorless crystals, m 139

coumarone C_8H_6O = 118 09 Benzofuran A colorless liquid, $d_{15°}$ 1 078, m −18, b 169,

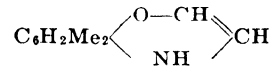


insoluble in water, soluble in alcohol or ether **dihydro-** Coumaran **dihydroketo-** Benzofuranone **dimethyl-** $C_{10}H_{10}O$ = 146 15 1 2-dimethyl-benzofuran Colorless liquid, b 210 **hydro-** See *hydrocoumarone* **iso-** C_8H_6O = 118 09 The heterocyclic system



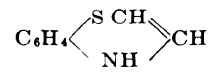
ketodihydro- See *ketocoumaran* **methyl-** C_8H_8O = 133 12 2-methyl-benzofuran, beta-methyl-coumarone A colorless liquid, b 189

coumazonic acid $C_{10}H_{11}ON$ = 161 09 The heterocyclic system

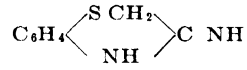


methyl- $C_{11}H_{13}ON$ = 175 1 Meta-methylcoumazonic acid, benzotrimethylmethoxazine Colorless crystals, m 218

coumothiazone C_8H_7NS = 149 1 The heterocyclic system



imido- $C_8H_8N_2S$ = 164 1 Benzylene-ψ-thiourea Colorless crystals, m 137



counterirritant A drug producing superficial irritation, used to mask the effects of other irritants or abnormal processes, *e g* , cantharides mustard, capsicum, chloroform, etc

counterstain A microscope stain used for making clearer, by contrast, structures already colored by another stain

counting apparatus A device for counting bacteria or blood corpuscles **c chamber** A microscope slide with rectangular rulings, used for counting blood corpuscles and bacteria **c pipette** A graduated capillary glass tube, used for making smears of milk or blood for counting bacteria or blood corpuscles

coupeic acid An active principle of oiticica oil

Coupier's blue $C_{24}H_{18}N_4$ = 334 16 Azodiphenyl, p,p'-diphenylazobenzene The compound, Ph C_6H_4 N N C_6H_4 Ph, m 250

couple (1) A pair of galvanic cells Cf *thermocouple, zinc-copper c* (2) To condense or unite two molecules

coupling Condensation between the nitrogen of a diazo group and a carbon of a ring compound

courare Curare

Courtois, Bernard 1777–1838 A French chemist, the discoverer of iodine

cousso See *kousso*

C O V Concentrated oil of vitriol, 95–96 % H_2SO_4, by weight

co-valence See *valence* **dative-** That type of c , analogous to electrovalence, in which one of the two atoms concerned contributes both electrons **normal-** The usual form of c , in which each of the atoms concerned contributes one electron

covelline, covellite CuS A native copper sulfide

covolume The quantity *b* in Van der Waal's equation (q v)

Coward unit A vitamin unit, q v

Cowper stove Tall iron cylinders lined with fire-brick and used for the production of a hot blast for the smelting of iron

coxanthin $C_{40}H_{56}O_6$ = 632 4 A carotenoid (q v) pigment of brown algae

coyol palm A tropical palm, *Acrocomia* species, yielding an oil

CP An abbreviation for chemically pure

Cp (1) The symbol for cassiopeium (2) An abbreviation for molecular heat at constant pressure

Cr The symbol for chromium

cracca Tephrosia

cracked Broken, *e g* a molecule which is split into component parts **c kerosene** A gasoline substitute obtained by super-heating kerosene under pressure, and distilling a volatile fraction at the boiling point of gasoline

crackene A proposed name for the hydrocarbon-mixture obtained by cracking low-temperature tars

cracking A process of making gasoline by superheating hydrocarbons in a gaseous atmosphere, as, hydrogen The hydrocarbons of high molecular weight break down into those of lower molecular weight Catalysts are also often included in the process Cf *hydrogenation, Bergius' process*

cradin A principle obtained from the leaves and twigs of the common fig It is said to be a peptic ferment, resembling papain in its action

Crafts, James Mason 1839–1917 An American chemist, noted for organic syntheses Cf *Friedel-Crafts reaction*

cramp bark High cranberry The bark of *Viburnum opulus*, a Caprifoliaceae, used as an antispasmodic

Crane, Evan J 1889– An American chemist noted for work on nomenclature and abstracts of chemical literature

crateriform A round depressed cone in a solid culture medium, due to liquefaction of the medium by certain bacteria

crawley Coral root

cream The thick, yellowish-white layer formed on the surface of milk on standing It consists of milk rich in fat, and is a highly nutritious article of food **cold-** Cold cream **ice-** A frozen food prepared from milk and flavorings

cream of tartar Potassium bitartrate

creaming The gradual rise or fall of the disperse phase of an emulsion, according as its specific gravity is less or greater than that of the continuous phase Cf *colloids, churner*

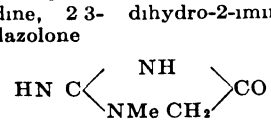
creamometer A device for estimating the amount of fat in milk

creasote Creosote

creatinase An enzyme which transforms creatine to creatinine

creatine $C_4H_9O_2N_3 + H_2O$ = 131 12 Methylglycocyamine, guanidine methylglycine, guanyl methylglycine, methylguanidoacetic acid $NH_2\,C\,NH\,NMe\,CH_2\,COOH$ An alkaloid or amino acid from the muscular tissue of all vertebrates Colorless, monoclinic crystals, decomp 300, sparingly soluble in water or alcohol, insoluble in ether, used as a tonic Cf *alacreatine*

creatinine $C_4H_7ON_3$ = 113 20 Methylglycocyamidine, 2 3- dihydro-2-imino-1-methyl-4(5)-imidazolone



An anhydride of creatine, and a normal constituent of urine White prisms, decomp 270, slightly soluble in water or alcohol Cf *phosphagen* **xantho-** See *xanthocreatinine*

creatotoxin A meat poison, or ptomaine

creeping Describing (1) any precipitate which rises on the walls of a wet glass container, (2) a solution which, during crystallization, deposits crystals on the sides and top of its container, (3) a liquid which permeates and passes through the packings of machinery (*e g*) pumps (4) The elongation of a metal, especially at high temperatures, under a stress considerably less than that required to break it

Crell, Lorenz Friedrich von 1744–1816 A German chemist and mineralogist, noted as founder of chemical periodicals

crenic acid $C_{24}H_{12}O_{16}$ = 556 1 Apocrenic acid An acid produced by molds, found in the soil and in certain springs

crenilabrin A protamine from the sperm of the cunner fish, *Crenilabrus pavo*

creolin Analgin A black syrupy liquid derived from coal tar, and consisting of saponifiable acids and resins, used as an antiseptic, deodorizer, and hemostatic, and forms a milky emulsion with water, d 1 04–1 08, soluble in alcohol ether, or chloroform

creosal Tannosal

creosol $C_8H_{10}O_2$ = 138 12 2-methoxy-1-hydroxy-4-methyl-benzene, 2-methoxy-4-methylphenol, methoxy-cresol, MeO C_6H_3(OH)Me A colorless oily liquid obtained from beech wood cresols, $d_{15°}$ 1 096, b 220, slightly soluble in water, miscible with alcohol or ether, used as an antiseptic

creosotal Creosote carbonate

creosote An oily distillate from wood or other tars, consisting chiefly of cresol, oxycresol, methylcresol, and other phenols, d 1 035–1 085 b 200, soluble in water, alcohol, ether, or chloroform Used medicinally as an antiseptic, local anesthetic, and caustic **c carbonate** Creosotal An antiseptic, oily derivative of creosote **methylene-** Pneumin **oleo-** C oleate **c oleate** Oleocreosote A yellowish oily liquid, d 0 950, insoluble in water, used as an antiseptic

cresalol C_6H_4(OH)$COOC_6H_4Me$ = 228 10 A mixture of the o-, m-, and p- compounds A white powder used as an antiseptic dusting powder

cresatin MeC_6H_4OOCMe = 150 08 m-cresyl-acetate A colorless, oily liquid, insoluble in water, soluble in alcohol, used as an antiseptic or analgesic

cresegol See *egol*

cresidine C_7H_9ON = 123 08 Aminohydroxytoluene, aminocresol, methylaminophenol, NH_2-C_6H_3Me OH, Some of the isomers are

4-amino-2-hydroxytoluene	m 161
5-amino-2-hydroxytoluene	m 175
6-amino-2-hydroxytoluene	m 128
4-amino-3-hydroxytoluene	m 174
5-amino-3-hydroxytoluene	m 79, b 345
2-amino-4-hydroxytoluene	m 144
3-amino-4-hydroxytoluene	m 135

cresol C_7H_8O = 108 10 Cresylic acid, methylphenol, Me C_6H_4 OH **amino-** Cresidine **iodo-** Traumatol **isopropyl-o-** Carvacrol **6-isopropyl-m-** Thymol **ortho-** A colorless liquid, $d_{15°}$ 1 051, m 30, b 190 8, sparingly soluble in water, miscible with alcohol or ether **meta-** A colorless liquid, $d_{15°}$ 1 039, m 4, b 205, slightly soluble in water, miscible with alcohol or ether **2-methoxy-p-** Creosol **methyl-** Xylenol **para-** Colorless prisms,

$d_{15°}$ 1 039, m 36, b 201 1, sparingly soluble in water, miscible with alcohol or ether The cresol of commerce is a brownish-red syrupy liquid obtained from coal tar, and contains a mixture of the three cresols, used as a disinfectant **triiodo-** Losophan **trinitro-** See *trinitrocresol*

cresolphthalein $C_6H_4(CO)_2(C_6H_3OHMe)_2$ = 346 14 Methylphenolphthalein Colorless crystals, m 216, slightly soluble in water, readily in alcohol or ether, used as an indicator from pH 8 2 (colorless) to 9 2 (red)

cresol purple $C_{21}H_{18}O_5S$ = 382 27 *m*-Cresol sulfonphthalein A brown powder, used as indicator, from pH 1 5 (red) to 2 5 (yellow) **brom-** See *bromocresol purple*

cresol red $C_{21}H_{18}O_5S$ = 382 27 *o*-Cresol sulfonphthalein A brown powder, used as an indicator from pH 7 2 (yellow) to 8 8 (red)

cresolsulfonic acids $C_7H_8O_4S$ = 188 13 A group of monobasic acids derived from the cresols, $C_6H_3Me(OH)(SO_2OH)$, used as antiseptics and in organic synthesis **a-** or 1 2 4-p-cresol-2-sulfonic acid, 4-hydroxytoluene-2-sulfonic acid Colorless crystals, m 188, **v-** or 1 2 3- o-cresol-6-sulfonic acid, 2-hydroxytoluene-6-sulfonic acid Colorless crystals, m 118

cresorcin $C_{22}H_{16}O_5$ = 360 14 *2 7*-Dimethyl fluorescein, *2 7*-dimethyl resorcinol phthalein A yellow dye and pH indicator

cresorcinol *2 4*-Dihydroxy toluene

cresorcyl The radical —$C_6H_2(OH)_2Me$ **c aldehyde** $C_8H_8O_3$ = 152 06 *2 4*-Hydroxy-*5*-methyl benzaldehyde

cresotic acid $C_6H_3Me(OH)(COOH)$ = 152 06 Hydroxytoluic acid Hydroxymethyl benzoic acid, methylsalicylic acid, cresotinic acid, cresol carboxylic acid A group of monocarboxy acids which exist in a number of isomeric forms which are designated by the positions of the hydroxy group (first numeral) and the methyl group (second numeral) as follows

2 3- or 2-hydroxy-m-toluic acid	m 160
2 4- or 2-hydroxy-p-toluic acid	m 178
2 5- or 6-hydroxy-m-toluic acid	m 152
2 6- or 6-hydroxy-o-toluic acid	m 167
3 2- or 3-hydroxy-o-toluic acid	m 183
3 4- or 3-hydroxy-p-toluic acid	m 207
3 5- or 5-hydroxy-m-toluic acid	m 208
3 6- or 5-hydroxy-o-toluic acid	m 172
4 2- or 4-hydroxy-o-toluic acid	m 177
4 3- or 4-hydroxy-m-toluic acid	m 172

cresotinic acid Cresotic acid

cresoxy Toloxy

cresyl (1) The monovalent $HOC_6H_3(CH_3)$— or C_7H_7O— radical derived from cresol There are 10 isomers, derived from o-, m-, and p-cresols (2) Tolyl, q v Cf *cresotic acid* **c acetate** Kresatin **c alcohol** Cresol **c blue.** An oxidation-reduction indicator, q v **c hydrate.** Cresol **c hydride** Toluene **c phosphate** Tricresyl phosphate **c violet** A dye used as a vital stain for blood

cresylate A compound containing the monovalent $C_6H_4(CH_3)O$— or C_7H_7O— radical, derived from cresol They are homologs of the phenates

cresylene Tolylene

cresylic acid A mixture of o-, m-, and p-, cresols

cresylite An explosive consisting of 60 pts picric acid and 40 pts trinitro-*m*-cresol

creta (praeparata) Chalk

cretaceous A white, opaque, chalky growth of bacteria

cretaform Oxy-methyl cresol tannin An internal astringent and antiseptic

cristal Crystal

cristallisation Crystallization

cristobalite A crystalline form of silica, d 2 32 formed on heating quartz to 1200, and stable below 1710 It exists in two forms α- and β-, transition temperature 200–275°C Cf *silica*

crith Krith

crithmene $C_{10}H_{16}$ = 132 12 A terpene from samphire, *Crithmum maritimum*, an Umbelliferae

critical Pertaining to a turning point or abrupt change **c angle** The angle of incidence, i, of a ray of light at which it is refracted through a prism so that its angle of emergence is 90°, hence, if the angle of incidence is larger, the light pencil will not be refracted but reflected The critical angle depends on the refractive index between the two media, and is given by $\sin i = 1/n$, where i is the critical angle of incidence, and n the **refractive index c coefficient** The expression RTd/p, in which R is the gas constant, T the critical absolute temperature, d the critical density and p the critical pressure **c conditions** The c temperature and c pressure **c constant** Any magnitude relating to the critical state **c density** The density of the liquid and vapor at the c temperature and c pressure **c hygrometric state** The quantity $100p/P$, where p and P are the vapor pressure of the system and of water, respectively It determines whether a substance will be deliquescent or efflorescent **c point** The conditions at which two phases (*e g*, liquid and vapor) are just about to become one phase, *i e*, the mixture becomes homogeneous **c pressure** The pressure necessary to condense a gas at the c temperature (q v), above which the gas cannot be liquefied, no matter what pressure is applied (See table) **c solution temperature** The temperature at which a mixture of two liquids, immiscible at ordinary temperatures, just ceases to separate into two phases It is used to establish the purity of a liquid, as it is altered considerably by impurities **c temperature** The temperature, T_c, at which a gas can be liquefied by a maximum pressure, the c pressure, above this temperature the gas

CRITICAL TEMPERATURES AND PRESSURES OF SOME COMMON GASES

Substance	Critical temperature °C	Critical pressure atm
Helium	−267 75	2 26
Hydrogen	−234 5	13 4
Oxygen	−118	49 3
Nitrogen	−145	33 65
Chlorine	141	79 6
Carbon monoxide	−113 7	34 6
Carbon dioxide	31	72 85
Nitrous oxide	36 5	71 65
Ammonia	133	112 3
Water	374	217 5

cannot be liquefied, no matter what pressure is applied. Approximately, $T_c = T_m + T_b$, where T_m is the melting point and T_b the boiling point of the substance (Prud'homme's rule); or $T_c/T_b = 1.5$ (Guldberg-Guye's rule). See Table. **c. volume.** The volume of one gram of substance at the c. temperature and c. pressure.

croceic acid. 2-Naphthol-8-sulfonic acid.

crocetin. $C_{20}H_{22}O_4 = 328.15$. *α-* The aglucone of the pigment of saffron, *Crocus sativa* and the seeds of *Gardenia grandiflora;* orange-red crystals, m.104, insoluble in water. Cf. *carotenoids, crocin, bixin, azafrin.* *β-* $C_{21}H_{23}O_4 = 341.15$. The monomethyl ester of *α*-c. *γ-* $C_{22}H_{26}O_4 = 354.15$. The dimethyl ester of *α*-c.

crocic acid. Croconic acid.

crocidolite. $NaFe(SiO_3)_2.FeSiO_3.H_2O$. A lavender-colored form of asbestos or hydrated ferrous-ferric silicate.

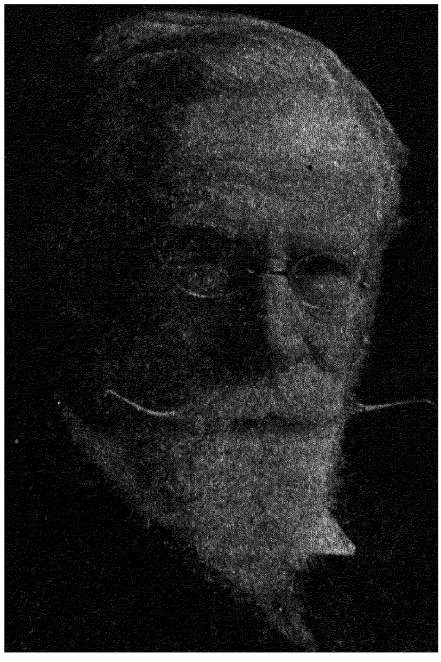
crocin. $C_{44}H_{70}O_{28} = 1046.56$. The coloring matter of saffron, and the fruit of *Gardenia grandiflora*, a Rubiaceae of China and of *Crocus sativus* and *Fabiana imbricata.* Used for dyeing the yellow robes of mandarins. A bright-red powder, soluble in water or alcohol; hydrolysed to gentiobiose and crocetin. Cf. *carotinoids, crocose.*

crocoisite. $PbCrO_4$. Crocolite, crocoite. A red, native lead chromate.

crocoite, crocolite. Crocoisite.

croconic acid. $C_5H_2O_5 = 142.04$. Crocic acid. A dibasic ketonic acid. Yellow crystals, m.180, soluble in water or alcohol. **c. acid hydride.** $C_5H_5O_5 = 145.03$. A tribasic ketonic acid. Cf. *leuconic acid.*

crocose. $C_6H_{12}O_6 = 180.05$. A sugar and splitproduct of crocin. Colorless crystals, soluble in water. Probably identical with gentiobiose.



Sir William Crookes.

(From Thomson's Outline of Science. Courtesy of G. P. Putnam's Sons, N. Y.)

crocus. (1) Saffron. (2) A form of red ferric oxide which is used for polishing. **antimony-** See *antimony.* **meadow-** Colchicum. **c. martis.** Colcothar.

Crookes, Sir William. 1832–1919. An English physicist and chemist, noted as founder of Chemical News and work on electrical discharges through gases and vacuum tubes. See illustration. **C. glass.** An optical glass which eliminates many of the ultraviolet rays of the sun. **C. radiometer.** An evacuated glass bulb containing a shaft with four arms, pivoted in the center, which revolves horizontally under the influence of radiant heat. Affixed to the end of each arm, vertically, is a very light vane one side black, the other silvered. **C. space.** A dark space around the cathode of a low pressure x-ray tube, through which a high voltage current is passing. **C. tube.** A highly exhausted vacuum or x-ray tube.

crookesite. A mineral containing thallium (17 %) selenium, copper and silver.

crotaconic acid. $C_5H_6O_4 = 130.05$. A dibasic acid, isomeric with itaconic acid and derived from crotonic acid.

crotaline. A protein in the venom of the rattlesnake; used hypodermically in the treatment of epilepsy.

crotalotoxin. $C_{34}H_{54}O_{21} = 798.42$. A crystalline principle from the venom of the rattlesnake, *Crotalus adamanteus.*

Croton. A genus of euphorbiaceous plants which yield various products; *e.g.,*

C. lacciferus	lac
C. cascarilla	cascarilla bark
C. niveus	copalchi
C. eluteria	cascarilline
C. tiglium	croton oil

c. oil. The fixed oil from the seeds of *C. tiglium* (see *tiglium*). A pale-yellow oil, d.- 0.940–0.955, insoluble in water, soluble in alcohol, ether, chloroform or carbon disulfide; contains chiefly tiglic acid. Used as a drastic purgative, or externally as a local irritant.

crotonal. The bivalent $C_4H_6=$ radical, derived from crotonaldehyde.

crotonaldehyde. $C_3H_5.CHO = 70.07$. Propylene aldehyde, *2*-butenal*, crotonic aldehyde, an unsaturated aldehyde forming a colorless liquid, $d_{14°}$.0.859, b.104, soluble in water.

cis- H.C.Me
‖
H.C.CHO

trans- Me.C.H
‖
H.C.CHO

Used as a solvent for fats, waxes and resins

crotonallin. A toxic albumin from the seed *Croton tiglium.*

crotonarin. The solid part of croton oil.

crotonbetaine. $C_7H_{13}NO_2 = 143.12$. The base $Me_3N.CH_2.CH:CH.CO$, from beef muscle extract. Cf. *carnitine.*

crotonic acid. $C_3H_5.COOH = 86.046$. 1-carboxy-propylene, *α*-butenic acid. **alpha-** *trans-* *α*-butenic acid, *trans-2*-butenoic acid*, **trans-** crotonic acid. Me.C.H ‖ H.C.COOH. Colorless, monoclinic crystals, $d_{72°}$.0.973. m.72, b.189, soluble

in water **beta-** *cis-β*-butenic acid, *trans-2*-butenoic acid* cis-crotonic acid

Cf *iso-crotonic acid* **α-methyl-** Tiglic acid **β-methyl-** Senecioic acid **γ-methyl-** α-Pentenic acid

c aldehyde Crotonaldehyde **c anhydride** $C_8H_{10}O_3$ = 154 08 2-Butenoic anhydride*, $(MeCH\ CH\ CO)_2O$ A colorless liquid, d 1 0397, b 247

crotonoid An atomic arrangement in which an atom with free electrons (*e g*, O or N) is bound by a double bond to carbon adjacent to an ethylene linkage, as R CH CH HC O or R CH CH HC NH It forms coordinate compounds Cf *conjugate bond*

crotonol Crotonolic acid

crotonolic acid $C_9H_{14}O_2$ = 154 11 A purgative monobasic acid from croton oil

crotonyl (1) The monovalent radical MeCH - CHCO—, or (2) the monovalent CH_3 CH CH— radical derived from crotonaldehyde It is isomeric with propenyl and allyl and occurs in the cis- and trans-form **c alcohol** CH_3 - CH CH CH_2OH = 72 08 Crotonyl carbinol, 3-buten-1-ol, Δ^3-1-butenol Colorless liquid, d 0 873, b 117, soluble in water

crotonylene C_4H_6 = 54 05 Dimethylacetylene, T^2-butine An unsaturated hydrocarbon from coal gas, MeC CMe A colorless mass or liquid, m 27–28 Isomeric with T^1-butine (ethylacetylene) EtC CH

crotoxin An active protein, containing sulphur, from the fresh venom secretion of the rattlesnake

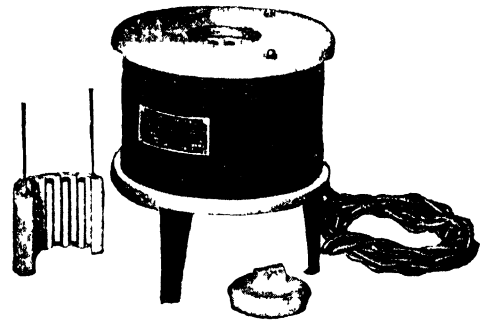
crottel A vegetable dye resembling cudbear (q v), at one time made in the Scottish Highlands

crotyl alcohol Butenol*

Crowell pump A rotary pump for producing vacua and air pressure

crown filler Hydrated calcium sulfate, $CaSO_4$ - $2H_2O$, used as a paper filler **c glass** Glass **c top** Rose *burner*

crucible (1) A vessel of conical shape with a rounded base for fusing or incinerating (2) The hearth of a blast furnace **assay-** A small cup of porcelain used for the combustion of drugs or of filter papers containing precipitates, in quantitative analysis **Gooch-** A c with a perforated bottom for filtrations in analysis **Hessian-** A large clay crucible for metallurgical work **Munroe-** A filter c similar to a Gooch c with a layer of spongy platinum deposited on filterpaper as the filtering medium **nickel-** A c used for fusions **platinum-** A small platinum cup used in quantitative analysis **porcelain-** Assay c **quartz-** A small cup made of transparent quartz, and used in quantitative analysis for combustion at high temperatures **Rose-** A lid for a crucible fitted with an inlet tube for burning a substance in a current of coal gas **sillimanite-** A c made of sillimanite, used as a superior substitute for porcelain **sintered glass-** A filter c the base of which consists of sintered glass which acts as filtering medium The size of the pores is graded according to the nature of the precipitate **c etching** Diamond *ink* **c furnace** An electrically-heated resistance wire imbedded in a refractory material, which makes temperatures of 1000°C possible within 30 minutes **c holder** A rubber ring in a glass funnel for holding Gooch crucibles **c steel** Pot steel Steel made by the c process **c tong** A pair of scissor-like metal tongs for handling crucibles **c triangle** A metallic wire or pipeclay triangle for supporting a crucible over the gas burner **c tubing** Wide, soft, rubber



Crucible furnace

tubing fitting over a crucible to connect it with an Erlenmeyer flask in vacuum filtration

Cruciferae The mustard family, a group of herbs with pungent, watery juice and flowers consisting of four petals and sepals, with cross-like arrangement

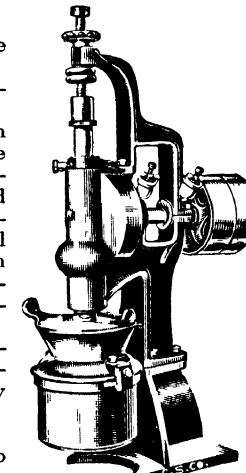
Brassica (Sinapis) alba	white mustard seeds
Brassica (Sinapis) nigra	black mustard seeds
Brassica oleracea	cabbage seed oil
Brassica napus	rape seed oil
Capsella bursa pastoris	bursine
Cheiranthus cheiri	cheirin
Cochlearia armoracia	horseradish
Cochlearia officinalis	cochlearia
Erysimdum species	erysimin
Isatis tinctoria	indican, woad

crude Unrefined or raw, *e g*, crude drugs (roots, leaves, etc), crude chemicals (technical and unrefined substances, the hydrocarbons obtained from coal tar) Cf *intermediates*

Crum Brown rule See *Brown*

curin $(C_9H_7N\ HSCN)_3$-$Bi(SCN)_3$ = 947 60 Quinoline bismuth sulfocyanate, quinoline bismuth sulforhodanide A brick-red micro-crystalline powder, insoluble in alcohol or ether, decomp in water, soluble in acetone, used as an antiseptic and astringent

crusher A power-operated device for pulverizing materials by impact blows Cf *chopper, grinder, mill*



Crusher

crushing To hammer to pieces, as, opposed to grinding, q v

crutcher. A mixing machine used in the soap industry

cryofine Kryofine

cryogenics Experiments at low temperatures, generally below −100°C

cryogenin (1) A freezing mixture, or a substance by which low temperatures are produced (2) Cryogenine

cryogenine Kryogenin, m-benzamino semicarbazide White, odorless, bitter crystals, soluble in alcohol or ether, slightly soluble in water, used as an antiseptic and antipyretic

cryohydrate Cryosel A salt that contains water of crystallization only at a low temperature, e g , a eutectic mixture of salt and ice

cryohydric point The temperature at which a cryohydrate crystallizes from a freezing mixture

cryolac number The proportion of the freezing point depression of milk that is accounted for by the chloride and lactose present It indicates the addition of water

cryolite Na_3AlF_6 A double fluoride of sodium and aluminum A pale-gray mineral, d 3 0, hardness 2 5 It is a source of aluminum, alum, and caustic soda Cf *Thomsen process*

c glass Milk *glass*

cryometer A thermometer for low temperatures

cryoscope A device for determining the freezing point of a liquid, it is used in physiological and chemical research work Cf *Friedenthal's c , Hortvet's c*

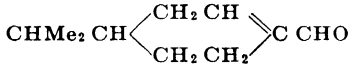
cryoscopic method The determination of the molecular weight of an organic substance by observing the depression of the freezing point of a solution due to the solute Cf *Raoult's law*

cryoscopy The study of physical and chemical changes at low temperatures, especially the depression of the freezing point Cf *kryoscopy*

cryosel Cryohydrate

cryostat A thermo-regulator for maintaining low temperatures

cryptal $C_{10}H_{16}O$ = 152 12 *4*-Iso-propylcyclohexene aldehyde,



A constituent of the oil from *Eucalyptus hemiphloia* and *E polybractea*

cryptidine $C_{11}H_{11}N$ = 157 09 An alkaloid formed by the dry distillation of quinine Cf *kryptidine*

cryptocarine An alkaloid from the bark of *Cryptocarya australis*, a Lauraceae of Queensland

cryptocrystalline Micro-crystalline

cryptocyanine Kryptocyanine

cryptogams A large division of plants characterized by having no true flowers, but propagating by spores Cf *Phanerogams* The more important groups are

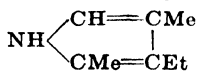
Thallophyta (Algae, Lichen, Fungi)
Bryophyta (Mosses, Liverworts)
Pteridophyta (Filices, Ferns)

cryptometer An optical wedge to determine the covering or "hiding" power of paint

cryptophanic acid $C_5H_9O_5N$ = 163 07 A dibasic acid and constituent of urine

cryptopine $C_{21}H_{23}O_5N$ = 369 2 One of the alkaloids of opium, m 217, a hypnotic and anodyne

cryptopyrrole $C_8H_{13}N$ = 123 08 A base derived from hemin and chlorophyllin,



Colorless liquid, d 0 93, b_{15mm} 85

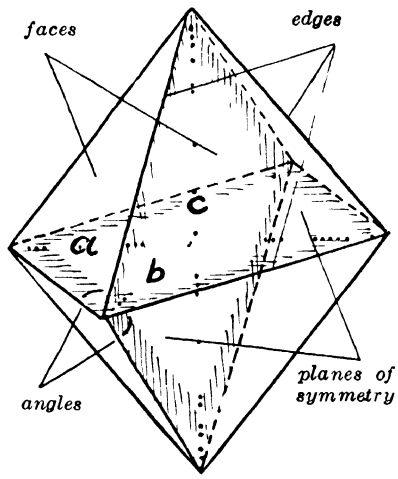
cryptoscope Fluoroscope

cryptovalency An abnormal valency, *e g* , the tetravalent oxygen, or divalent carbon

cryptoxanthin A carotene from the berries of the *Physalis* species, which is similar in effects to vitamin A

cryst Abbreviation for *crystalline*

crystal A homogeneous and angular solid of definite form which is characterized by geometrically arranged plane surfaces (called



axes = a,b,c
Crystal

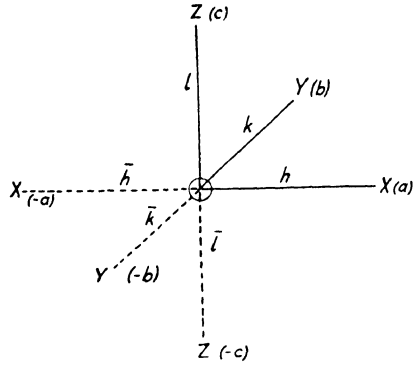
faces) and a symmetrical internal structure (see *crystal structure*) The crystals are usually classified into six or seven systems (see *crystal systems*) and are of three general types homopolar-, ionic- and metallic- (See figures) **acicular-** A needle-shaped crystal **arborescent-** A slender and branching crystal resembling a plant or tree **blood-** Hemin **complex-** A crystal having dissimilar faces **double-** Twin crystals **hemihedral-** Having half as many faces as the geometrical pattern demands **holohedral-** Having all the faces that the geometrical pattern demands **homopolar-** Nonpolar- A c consisting of a space lattice of atoms in which all valencies are satisfied, characteristic of organic compounds, hence, molecules held together by weak van der Waal's force into soft c of low melting point **ionic-Polar-** A c consisting of a space lattice of ions, as, Na^+ and Cl^-, in which the atoms have lost or gained electrons and no particular atom is united to another particular atom, hence the entire crystal is a giant molecule This is characteristic of inorganic compounds **lead chamber-** Nitrosyl sulfate **liquid-** A liquid which has the optical properties of a crystal **metallic-Co-ordinate-** A c consisting of a space lattice of positive ions and electrons in which the electrons may replace each other, and so conduct an electric current **micro-** A crystal of microscopic size **mixed-** A crystal which contains two or more isomorphous substances, as aluminum chromium sulfate **nonpolar-** Monopolar c **polar-** Ionic c **racemic-** A crystal that is composed of two optically compensating isomers **seed-** Crystallon A crystal introduced into a saturated solution in order to act as a nucleus for the commencement of crystallization **simple-** A crystal that belongs

to one definite crystal system. **Teichmann's-** The hemin crystals of blood smears. **twin-** A crystal that consists of two crystals grown together along a common face.

c. alcohol. The alcohol of crystallization, or a crystal that contains alcohol molecules in its structure. **c. ammonia.** The ammonia of crystallization in the ammonates. *E.g.*, per molecule of substance, X, there are:—

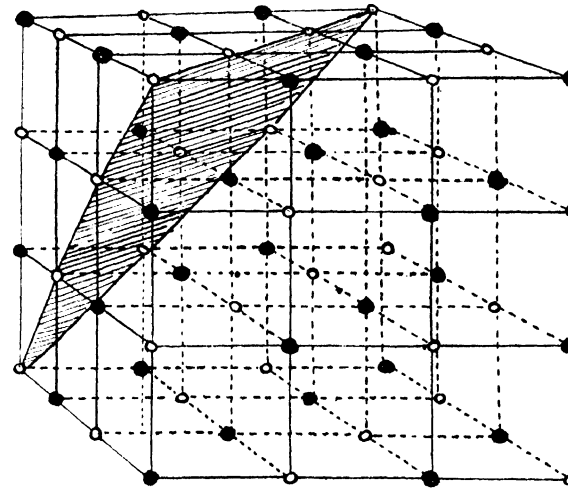
monammonate	$X.NH_3$
diammonate	$X.2NH_3$
triammonate	$X.3NH_3$
tetrammonate	$X.4NH_3$
pentammonate	$X.5NH_3$
hexammonate	$X.6NH_3$

c. axis. An imaginary line through the center of a plane of a crystal. See *c. system.* **c. carbonate.** The monohydrate of sodium carbonate, $Na_2CO_3.H_2O$. **c. chloroform.** The chloroform of crystallization, or a crystal that contains chloroform molecules in its structure. **c. coordinates.** The designation of the axes of a c. as derived from a crystallogram. See figure and *c. system.*



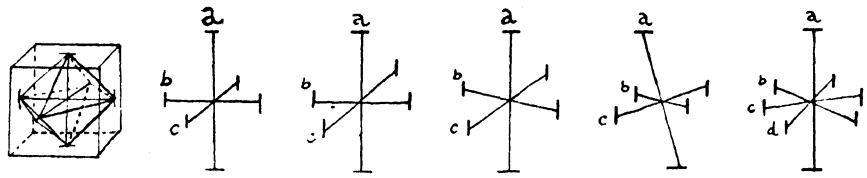
Crystal coordinates.
h, k, l, are the integers indicating the no. of atomic planes on that axis.

c. detector. A crystal which transmits electric current in one direction only; used to rectify alternating currents or detect radio waves; as, galena. **c. ether.** The ether of crystallization, or a crystal that contains ether molecules in its structure. **c. face.** Any plane surface of a crystal. **c. form.** The external geometrical shape of a crystal (see *c. system*). **c. model.** A model of wire, wood or glass, which illustrates the characteristic forms of crystals. **c. overgrowth.** The growth of one crystal around another. It is shown chiefly by isomorphous crystals. **c. pattern.** Space lattice, q.v. **c. structure.** The internal structure of a crystal as revealed by x-ray diffraction measurements. It is assumed that the individual atoms which compose the molecules of the crystal are arranged in a definite order (the space lattice), and the rows of atoms act as a diffraction grating for the very short wavelengths of x-rays (cf. *atomic planes*). From the pattern obtained on a photographic plate (the crystallogram, q.v.), the structure of the crystal is deduced. See figure. **c. system.** Any one of the seven fundamental systems of crystallography. The simplest means of classifying crystals is in terms of the axes, or the imaginary lines which pass from the faces or edges through the center of the crystal (see figures).



Crystal structure
(sodium chloride)

1. The ISOMETRIC system (Tesseral, cubic, regular or monometric)
The crystals have three axes; all of equal length and at right angles to one another and are, therefore, developed alike in the six directions of space (front, back, left, right, up and down). *Types:* cube, regular octahedron, rhombic do-



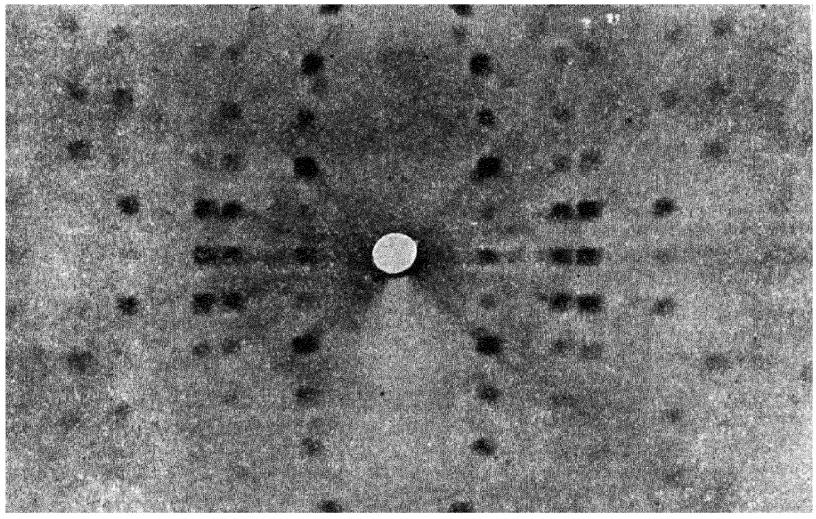
Crystal systems.

System	*Interaxial Angles*	*Length of Axes*
1. Isometric (cubic)	$\alpha = \beta = \gamma = 90°$	$a = b = c$
2. Tetragonal	$\alpha = \beta = \gamma = 90°$	$a = b \leqslant c$
3. Orthorhombic (rhombic)	$\alpha = \beta = \gamma = 90°$	$a \leqslant b \leqslant c$
4. Monoclinic	$\alpha = \gamma = 90°$; $\beta \leqslant 90°$	$a \leqslant b \leqslant c$
5. Triclinic	$\alpha \leqslant \beta \leqslant \gamma \leqslant 90°$	$a \leqslant b \leqslant c$
6. Hexagonal	$\alpha = \beta = 90°$; $\gamma = 60°$ and $120°$	$a = b \leqslant c$
7. Trigonal	$\alpha = \beta = \gamma \leqslant 90°$	$a = b \leqslant c$

decahedron, and their modifications. *Examples:* sodium chloride, alum, potassium iodide, garnet.

2. The TETRAGONAL system (dimetric or quadratic)

The crystals have three axes at right angles to one another. The two lateral axes are of equal length and the third (principal axis) is either shorter or longer; the crystals are, therefore, developed according to two patterns—one repeated four times in directions at equal intervals in a plane, the other twice in the direction at right angles to that plane. *Types:* prisms, pyramids, pinacoids. *Examples:* nickel sulfate, potassium ferrocyanide, zircon.



Crystallogram.

Rotating crystal or Siegbahn method (apparatus manufactured by Adam Hilger, Ltd., Londor *showing the crystal structure of benzil. C axis of the crystal is set parallel to the axis of rotation (see al Bragg, Debye and Laue crystallograms).*

3. The ORTHORHOMBIC system (rhombic, trimetric or prismatic)

The crystals have three axes of unequal length, all intersecting at right angles and are, therefore, developed according to three patterns, each repeated twice in opposite directions. *Types:* Combinations of pinacoids, prisms, domes, and pyramids. *Examples:* zinc sulfate, potassium nitrate, sulfur, citric acid, potassium sulfate.

4. The MONOCLINIC system (oblique or prismatic)

The crystals have three axes of unequal length, two of which intersect at an oblique angle and are perpendicular to the third axis. The crystals, therefore, are developed according to three patterns, each repeated in opposite directions, twice at angles less than 90° and twice at angles greater than 90°. *Types:* prisms, plates, needles. *Examples:* sodium sulfate, ferrous sulfate, oxalic acid, tartaric acid, potassium nickel sulfate.

5. The TRICLINIC system (assymetric)

The crystals have three axes of unequal length, all oblique to each other; and are, therefore, developed like the preceding two types, but with none of the patterns repeated exactly at right angles to one another. *Types:* Tetrahedro prisms, scales. *Examples:* Calcium sulfat potassium dichromate, copper sulfate.

6. The HEXAGONAL system

The crystal has four axes; three are of equ length, and at 60° to one another and inte sect the principal axis at angles of 90°. Tl crystals therefore, are developed according two patterns; one repeated six times at interval lying 60° apart in a plane, and the other patte twice in the directions at right angles to th plane. *Types:* prisms, pyramids, and pinacoid *Examples:* crystalline quartz, bismuth, an mony, thymol, beryl.

7. TRIGONAL or rhombohedral system.

The axes are as 6., and the crystal develo according to two patterns, one repeated thr times at intervals lying 120° apart in a plar and the other twice in the directions at rig angles to that plane. *Examples:* benitoi calcite.

c. violet. A methylated *p*-rosaniline, used an indicator, pH 0.0 (green) to pH 2.0 (blu (cf. *gentian violet*); as a Gram stain for bacteri intravenously as antiseptic. **c. water.** T water of crystallization; the water molecul which take part in the crystalline structu of a substance, *e.g.*,

monohydrate	$X.H_2O$
dihydrate	$X.2H_2O$
trihydrate	$X.3H_2O$
tetrahydrate	$X.4H_2O$
pentahydrate	$X.5H_2O$
hexahydrate	$X.6H_2O$
heptahydrate	$X.7H_2O$
octohydrate	$X.8H_2O$ et

crystalbumin. An albuminous substance in t crystalline lens of the eye.

crystallin. (1) A solution of 1 part pyroxyl in 4 parts methanol and 15 parts amyl aceta

used similarly to collodion (2) A soluble protein from the lens of the eye, α- coagulating at 72, β-coagulating at 63

crystalline Pertaining to crystals **micro-** Pertaining to crystals of microscopic size

crystallite An imperfectly formed crystal

crystallization The change from the dissolved, molten, liquid, or gaseous state to a solid state of definite, ordered and characteristic shape **fractional-** Repeated c for the purpose of purification or separation of a substance **heat of-** See heat **liquid of-** The molecules of solvent which enter into the space lattice of crystals, as, acetone, acetic acid, alcohol, ammonia, chloroform, ether, and most commonly water

crystallize (1) To assume crystalline shape (2) To cause crystallization

crystallized Formed into crystals

crystallogram The photographic record obtained when x-rays are diffracted by a crystal or crystal-powder They vary according to the experimental arrangement

(A) *x-rays* (polychromatic or monochromatic),

(B) *beam definition* (pinhole or slit),

(C) *sample* (single and stationary crystal, single and rotating crystal, or crystal powder),

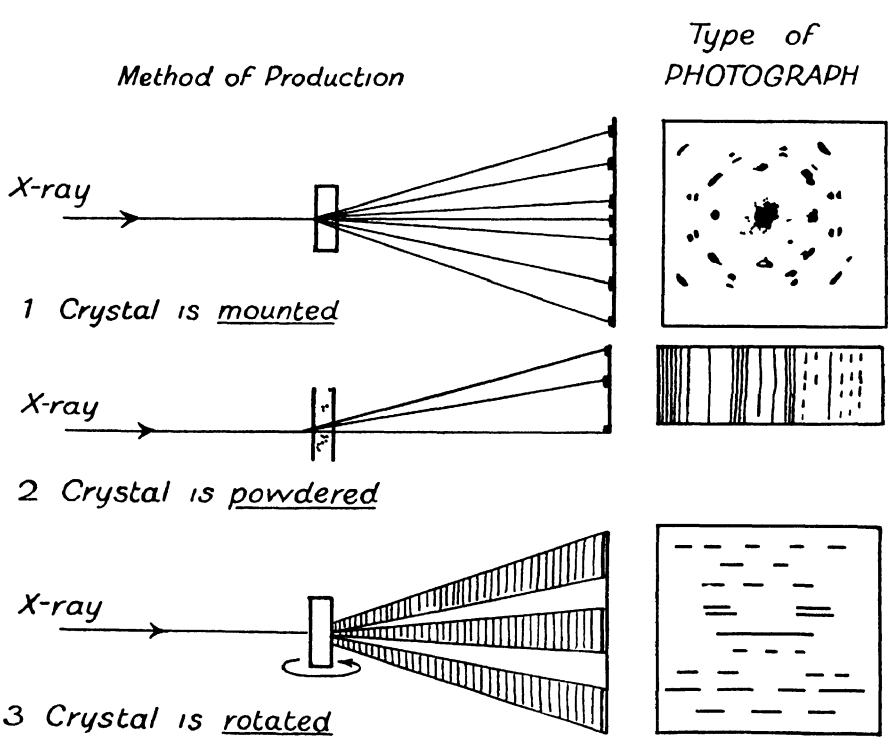
(D) *recording device* (plane surface photographic plate, cylindrical film, or ionization chamber) Cf *x-ray spectrometer, halo, corona,* see figures

Bragg- DeBroglie- Siegbahn- A spectrum-like pattern produced when monochromatic x-rays pass through a slit and a rotating crystal Cf *Moseley spectrum* **Clark-** Duane- A curve obtained by plotting the ionization current found at different angles when a beam of x-rays passes through a stationary crystal **DeBroglie-** Bragg- **Debye-** Scherer- Hull- A spectrum-like pattern consisting of curved and concentric lines, which are produced on a cylindrical and narrow film that surrounds a crystal powder or crystal which diffracts a beam of monochromatic x-rays **Duane-** Clark- **Hull-** Debye- **Laue-** The original c, in which polychromatic x-rays pass through a pinhole and a single stationary crystal, behind which is a plane photographic plate or film on which the characteristic Laue pattern is produced **modified Laue-** Monochromatic pinhole- **monochromatic pinhole-** A modified Laue method using monochromatic x-rays Used for (1) single crystals (which produce a simpler Laue pattern), (2) powders (which produce concentric rings), (3) fibers (which produce a system of symmetrical and discontinuous arcs), and other materials **Polyani-** Siegbahn- **Scherer-** Debye- **Schiebold-** Siegbahn- **Seeman-** Bragg- **Siegbahn-** Polyani- Schiebold- A Laue pattern produced by monochromatic x-rays and a slowly rotating single crystal

crystallographic apparatus A device for measuring the angles and optical properties of crystals, as, goniometer, dichroscope, petrographical microscope

crystallography The science of crystals Originally the measurement and classification of the external shape of crystals (crystal systems), now, the study of the internal, molecular and atomic arrangement of crystals (crystal structure)

crystalloid An obsolete term applied to non-colloidal substances, hence, those substances



Crystallograms (types)

which pass through a semi-permeable membrane The broader meaning of "colloid" has eliminated this distinction

crystalloluminescence The emission of light during crystallization, *e g* by As_2O_3

crystallon Seed *crystal*

crystalon A trade name for silicon carbide

crystallose A soluble sodium salt of saccharin, used in diabetes as a sweetening agent

crystule A unit cell of a crystal, or a crystal unit

CTS Anhydrous sodium aluminum sulfate, a cream of tartar substitute

cubanite $CuFe_2S_4$ A copper ore

cube (1) A regular solid bound by six, equal square plane faces, the opposite faces being parallel Cf *space lattice* **hydrogen-** An alloy of 35 % sodium and 65 % lead pressed into cubes, and used for the rapid preparation of hydrogen (hydrone) **oxygen-** Cubes of sodium peroxide, with a trace of cupric oxide, used for the rapid preparation of oxygen (ozone) (2) An extract from cube root, the root of *Lonchocarpus nicou*, a Leguminosae of Peru, which is used as a fish poison and insecticide It contains rotenone, toxicarol and tephrosine Cf *derris, deguelin*

cubeb The dried unripe fruit of *Piper cubeba*, a Piperacea of Java The fluid extract is a stimulant and diuretic **c camphor** $C_{15}H_{20}O$ = 222 22 The solid portion of oil of cubeb **c oil** Essential oil of cubeb, it is an aromatic, colorless liquid d 0 905–0 925, b 175–280, whose constituents are cubebene and cubeb camphor

cubebene $C_{15}H_{24}$ = 206 22 A liquid hydrocarbon from cubeb oil

cubebic acid $C_{13}H_{14}O_7$ = 282 10 An amorphous resinous acid from cubeb, a laxative and diuretic

cubebin $C_{20}H_{20}O_6$ = 356 15 3 4-dimethylenoxy-p-oxystyrone Colorless needles, m 132, soluble in alcohol

cubic Pertaining to a cube **c centimeter** A unit of volume in the metric system the space occupied by a cube whose side is one centimeter long 1 cc = 1 cm^3 = 0 99996 ml = 0 06102336 cu in The volume occupied by 1 kg water at 4°C is the liter = 1000 ml = 1000 028 cc **c decimeter** 1 cu dm = 1 dm^3 = 1000 cm^3 = 61 023 in^3 **c foot** 1 cu ft = 28317 016 cm^3 **c inch** 1 cu in = 1 in^3 = 16 387 cm^3 **c meter** 1 m^3 = 1 000,000 cm^3 = 1 308 $yard^3$ = 25 314 cu ft **c system** See *crystal system* **c yard** 1 cu yd = 1 yd^3 = 0 765 m^3

cubical Relating to a cube or to three dimensions **c atom** A theory of atomic structure developed by Gilbert N Lewis The valence electrons occupy positions at the corners of a cube In a stable atom or compound there are eight electrons situated at the eight corners of a cube, hence a neon atom is inert and possesses zero-valency, while in a chlorine atom only seven corners are occupied and the atom is monovalent, as it can attract one more electron Cf *polar compound, Lewis-Langmuir theory, atomic structure, periodic chain* **c expansion** Volume expansion The enlargement of a solid in three planes **c system** The isometric or regular crystal system, q v

cubit An obsolete linear measure, 1 c = 18 in

cucaivite AgCuSe A native silver selenide

cucoline $C_{19}H_{23}O_4N$ = 329 2 An alkaloid from the root of *Cocculus* or *Sinomenium diversifolius*, a Menispermaceae White needles, m 162 insoluble in water, soluble in alcohol, ether or benzene **hydro-** $C_{19}H_{25}O_4N$ = 331 2 A colorless crystalline substance, m 198

cucumber (1) The vine, *Cucumis sativus*, a Cucurbitaceae (2) C fruit used as food **bitter-** Colocynth **oil of-** Gourd oil

Cucurbitaceae The gourd family, a group of succulent herbs, generally creeping and climbing by tendrils, a source of drugs

roots	
Bryonia alba (*dioica*)	bryony
Cayaponia globosa	cayaponin
fruits	
Megarrhiza californica	megarrhizin
Citrullus colocynthis	colocynth
Luffa aegyptiaca	vegetable sponge
Momordica balsamina	balsam apple
seeds	
Cucurbita pepo	pumpkin seed, cucurbitin
Cucumis citrullus	watermelon seed, cucurbito
Cucumis sativus	cucumber seed
Cucumis prophetarum	prophetin
resin	
Ecballium elaterium	elaterium

cucurbitine An alkaloid from the seeds of *Cucurbita pepo*

cucurbitol $C_{24}H_{40}O_4$ = 392 32 An alcohol from the seeds of the watermelon, *Cucumis citrullus*, a Curcurbitaceae Colorless crystals m 260

cucus oil Vetiveria oil

cudbear Persio, orchil A purplish-red coloring matter from lichens, *Rocella*, *Lecanora*, and other species, used as a pure food color for pharmaceutical preparations

cuinoline Cinnoline

cullet Crushed or broken glass

culture (1) A growth of microorganisms, *e g* pathogenic bacteria (2) C media, q v (3) To breed, incubate or grow microorganisms **direct-** A growth obtained from a natural source (tissue, sputum, etc), and directly transferred to a culture medium **pure-** A growth obtained from a single species **c apparatus** A device for growing microorganisms (anaerobic bacteria) in gases, *e g* nitrogen **c dish** A Petri dish (q v) or other shallow glass dish **c flask** A glass flask for growing micro-organisms in liquid culture media **c media** The substances on which bacteria are grown The more common are agar plain, agar glucose, agar glycerin agar lactose, agar serum, bouillon plain, bouillon glucose, bouillon glycerin, bouillon lactose gelatin plain, gelatin glucose, and blood serum **c. medium** The nutrient substance in a food for micro-organisms, used to cultivate or grow bacteria (See *c media*) **c slides** A microscope slide with one or two cavities for holding a small quantity of liquid **c tube** A test tube with plain rim used for culture media

cumal Cumylene The divalent $C_{10}H_{12}$=, or $C_3H_7\,C_6H_4\,CH$= radical, derived from cumic aldehyde

cumaldehyde Cumic aldehyde

cumalin Coumalin

cumanilide Cumophenamide

cumaric acid Coumaric acid

cumarin Coumarin

cumenamic acid Cuminamic acid

cumene C_9H_{12} = 120 15 1-Propyl benzene, $PhCHMe_2$ A colorless liquid hydrocarbon, $d_{20}°$ 0 862, b 153, insoluble in water, miscible with alcohol or ether, it is a constituent of cumin oil **methyl-** Cymene **pseudo-** See *pseudocumene*

cumenol Cuminol

cumenuric acid Cuminuric acid

cumenyl Cumyl The monovalent $C_3H_7C_6H_4$— or C_9H_{11}— radical, derived from cumene, it occurs as several isomers **c acrylic acid.** $C_{12}H_{14}O_2$ = 190 1 A monobasic acid, homologous to cinnamic acid **c amine** Cumidine **c angelic acid** $C_{14}H_{18}O_2$ = 218 15 A monobasic acid **c crotonic acid** $C_{13}H_{16}O_2$ = 204 12 A monobasic acid **c cyanide** Cuminitrile **c sulfurous acid** $C_9H_{11}HSO_3$ = 200 20 A monobasic acid, derived from cumene by the action of sulfuric acid

cumic Pertaining to the acid derived by oxidation from oil of cumin, q v **c acid** $C_{10}H_{12}O_2$ = 164 15 Cuminic acid, p-isopropyl-benzoic acid Colorless triclinic crystals, $d_4°$ 1 163, m 116 5, sparingly soluble in water, soluble in alcohol or ether **c alcohol** Cuminol **c aldehyde** $C_{10}H_{12}O$ = 148 15 Cumaldehyde, cuminic aldehyde, p-isopropyl benzaldehyde $Me_2CH\,C_6H_4\,CHO$ A colorless liquid, $d_{22}°$ 0 976, b 235, insoluble in water, miscible with alcohol or ether **c amide** Cuminamide

cumidic acid $C_{10}H_{10}O_4$ = 194 08 Dimethyl-phthalic acid An oxidation product of durene, dibasic acid, colorless crystals, m exceeds 320

cumidine $C_9H_{13}N$ = 135 16 Aminocumene, cumenylamine, p-isopropyl-aniline, 1-amino-4-isopropyl-benzene A colorless liquid, d 0 953, m −64, b 225, insoluble in water, soluble in alcohol or acids **pseudo-** See *pseudocumidine*

cumidino The monovalent radical $C_9H_{12}N$— or $Me_2CH\,C_6H_4\,NH$—, derived from cumidine

cumin The fruits of *Cuminum cyminum* an Umbelliferae of Europe, used as a stimulant, aromatic, and sedative **c oil** Roman cumin oil The essential oil from cumin seeds A limpid liquid with a sharp taste, d 0 900–0 930, containing cymene and cumic aldehyde

cuminal (1) Cumal (2) Cumic aldehyde **di-** Cuminil

cuminalcohol Cuminol

cuminaldehyde Cumic aldehyde

cuminamic acid $C_{10}H_{13}O_2N$ = 178 10 A derivative of cumic acid

cuminamide $C_{10}H_{13}ON$ = 163 10 Cumic amide The amide of cumic acid

cuminic acid Cumic acid **c alcohol** Cuminol **c aldehyde** Cumic aldehyde

cuminil $C_{20}H_{22}O_2$ or $C_9H_{11}CO\,COC_9H_{11}$ = 294 18 Dicuminal, dicuminoketone Colorless crystals, m 84

cuminoin $C_{20}H_{24}O_2$ = 296 19 Diisopropyl benzoin $C_9H_{11}CO\,CHOH\,C_9H_{11}$ A derivative of cuminil

cuminol $C_{10}H_{14}O$ = 150 11 Cuminic alcohol, cumic alcohol, 1-propylbenzyl alcohol, cumenol, cumin alcohol $C_3H_7\,C_6H_4CH_2OH$ A monobasic alcohol from cumin seeds A colorless liquid, d 0 978, b 246 6

cuminuric acid $C_{12}H_{15}O_3N$ = 221 1 C_3H_7-$C_6H_4\,CO\,NH\,CH_2COOH$, occurring in urine

Cummings apparatus A glass apparatus for the determination of ammonia in illuminating gas **c pump** A mercury-vapor vacuum pump

cumobenzyl alcohol See *phenyl paraffin alcohols*

cumol (1) Pseudocumene (2) A mixture of trimethyl benzenes, obtained as an oily hydrocarbon from coal tar, b 168–178

cumonitrile $C_{10}H_{11}N$ = 145 09 Cumenyl cyanide A derivative of cumene

cumophenamide $C_{16}H_{17}ON$ = 239 14 Cumanilide A compound of cumene and phenylamine

cumulated double bonds Two double bonds on the same carbon atom, thus

Cf *conjugated*

cumulative Storing up or increasing **c poison** See *poison*

cumyl Cumenyl

cumylene Cumal

cumylic acid Durylic acid

cunit Cubic unit A measure of volume, especially of wood, equal to 100 cu ft of solid unbarked wood Cf *cord, board foot*

cuorin $C_{71}H_{125}O_{21}NP_2$ = 1389 01 A phospholipin from the cow's heart, considered to be kephalin mixed with impurities

cupel A flat crucible or dish of bone ash, used in cupellation **c mould, mold** A brass cup with pestle for making cupels **c rake** An iron shovel or spatula for handling cupels **c tongue** A steel tong for removing cupels from the oven

cupellation The separation of silver or gold from its alloys in the analysis of silver and gold ores The unrefined metal is mixed with lead and placed in a cupel in the muffle furnace, where the impurities are either volatilized or absorbed by the cupel, and a button of noble metal is left

cupferron $C_6H_9O_2N_3$ = 155 09 Nitrosophenyl hydroxylamine, copperon, kupferron, ammonium nitroso-β-phenyl hydroxylamine, NH_4O-$NO\,NPh$ Yellow crystals, m 164 Its acid solution is used as a quantitative precipitating reagent for aluminum, copper, iron, titanium, zirconium, etc

cupola A dome-shaped furnace for melting pig iron

cupraloy An alloy containing Cu 99 4 and (Cr + Ag) 0 6 %, having high strength and electrical conductivity

cuprammonia A solution of cupric hydroxide in ammonia water, used as a solvent for cellulose

cuprammonium-ion The divalent complex ion, $Cu(NH_3)_4^{++}$, which possesses the characteristic deep-blue color obtained by adding ammonia in excess to a cupric salt solution **c rayon, c silk** See *rayon* **c sulfate** The solution $CuSO_4 + 4NH_3 + H_2O$ **c viscosity** The viscosity of a solution of cellulose in c measured under standard conditions, it is a means of evaluating cellulosic materials

cuprase A non-toxic colloidal cupric hydroxide, used in the hypodermic treatment of cancer

cuprate silk Cuprammonium rayon, q v

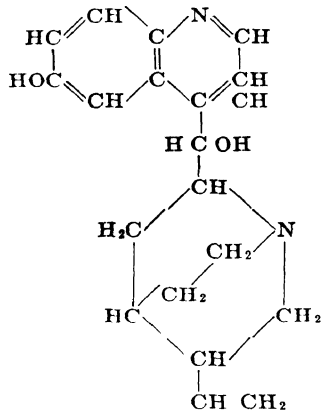
cuprea bark The bark of *Remijia* species of tropical America, which yields quinine and other cinchona alkaloids

cupreane Desoxycupreine An alkaloid from cuprea bark

cupreidane Desoxycupreidine An alkaloid from cuprea bark

cupreidine. $C_{19}H_{22}O_2N_2$ = 310 17 The *d*-isomer of cupreine, a cinchona alkaloid from cuprea bark **desoxy-** Cupreidane

cupreine $C_{19}H_{22}O_2N_2$ = 310 17 *l*- Cupreidine A cinchona alkaloid from cuprea bark



Colorless crystals, m 198, slightly soluble in water, ether or chloroform, soluble in alkalis **desoxy-** Cupreane **ethylhydro-** Optochine **methyl-** Quinine

cuprene $(C_{11-15}H_{10})_x$ Carbene A yellow-brown, solid polymerisation product made by heating acetylene in presence of copper

cupreol $C_{20}H_{34}O$ = 290 35 A cholesterol-like substance from the bark of *Cinchona calisaya*, a Rubiaceae

cupreous Cuprous

cupressin An oil of *Cypress* species, used medicinally for whooping cough

cupressus Cypress

cupric Describing compounds containing divalent copper, >Cu, which yield the cupric ion Cu^{++} in aqueous solution **c abietinate** $Cu(C_{19}H_{27}O_2)_2$ = 638 01 Green scales, insoluble in water, soluble in oils giving an emerald green colored solution, used as an anthelmintic and vermifuge, and for the impregnation and preservation of wood **c acetate** $Cu(C_2H_3O_2)_2 H_2O$ = 199 6 Verdigris, cryst aerugo, crystals of Venus Bluish-green crystals, d 1 9, m 250 decomp, soluble in water, alcohol, or ether, used as an astringent or alterant, as a mordant and for porcelain painting and enamels **(sub-)** Cupric subacetate **c aluminate** Copper alum, lapis divinus A compound of cupric sulfate, aluminum sulfate and potassium nitrate A green powder or bluish-green sticks, soluble in water, used in ophthalmology and as a mild caustic **c ammonium chloride** $CuCl_2 2NH_4Cl 2H_2O$ = 277 53 Ammonio-cupric chloride Blue crystals, soluble in water, used as a reagent for carbon in steel **c ammonium sulfate** $Cu(NH_3)_4SO_4 H_2O$ = 245 8 Dark blue, rhombic crystals, decomp at 150, soluble in water, insoluble in alcohol **c arsenate** $Cu_3(AsO_4)_2 \cdot 4H_2O$ = 540 7 Bluish-green crystals, insoluble in water, soluble in ammonia or acids, used medicinally as an alterative **c arsenite** $CuHAsO_3$ = 187 5 or $Cu(AsO_3)_2$ = 309 5 A mixture of the neutral and acid salt Green or yellowish-green crystals, insoluble in water, soluble in ammonia or alkalis, used as an intestinal antiseptic and alterative **c benzoate** $Cu(PhCOO)_2 2H_2O$ = 341 6 A light-blue crystalline powder insoluble in water alcohol **c borate** CuB_4O_7 = 219 6 bluish-green crystalline powder, insoluble water, soluble in dilute acid, used in ceram and artists' paints **c bromide** $CuBr_2$ 223 4 A grayish-black crystalline powd decomp on heating, soluble in water or alcoh **c butyrate** $Cu(C_4H_7O_2)_2 2H_2O$ = 273 Green monoclinic crystals, slightly solul in water, soluble in alcohol, used as a reage for essential oils **c carbonate** Only ba carbonates are known, *e g*, $3CuO 2CO_2 H_2$ copper lasur, mountain blue A basic c bonate of copper, used in seed wheat treatme to control smut, as a pigment, and in cerami **c cement** See *dental cement* **c chlora** $Cu(ClO_3)_2 6H_2O$ = 338 6 Blue, hygrosco crystals, soluble in water or alcohol, us as a mordant and in the dye industry **chloride** $CuCl_2$ = 134 5 Anhydrous copp chloride Brownish-yellow crystals, d 3 0 m 498, which decomp on further heati soluble in water or alcohol, used as a morda (cryst) $CuCl_2 2H_2O$ = 170 5 Blue, rhomb crystals, or green hygroscopic masses, d 2 4 2 53, which lose 2 mol water at 100°C, a decomp at red heat, soluble in water, alcoh or ether Used as a reagent and as mordant the dye industry, for manufacturing sympath tic inks and melanin, as a disinfectant, and the manufacture of aniline dyes **c chroma** $CuCrO_4$ = 179 7 A yellowish liquid **chromate, basic** $CuCrO_4 2Cu(OH)_2$ = 374 Basic copper chromate A light-brown powd insoluble in water, soluble in chromic a solution, used in the dye industry as a morda **c citrate** $Cu_2C_6H_4O_7 2\frac{1}{2}H_4O$ = 360 2 green powder, slightly soluble in water, us medicinally, and as a reagent for glucose **cyanide** $Cu(CN)_2$ = 115 6 A green powd soluble in water (cf *cupro-cupric cyanide*) **dichromate** $CuCr_2O_7 2H_2O$ = 315 8 Bro crystals, soluble in water **c ferrocyani** $Cu_2Fe(CN)_6 7H_2O$ = 465 2 A brownish-r powder, insoluble in water, soluble in ammo or KCN solution **c fluoride** $CuF_2 2H_2O$ 137 6 Blue crystals, sparingly soluble water **c fluosilicate** C silicofluoride *tetrahydrate* $CuSiF_6 4H_2O$ = 277 69 Bl monoclinic prisms, d 2 158, soluble in wat (b) *hexahydrate* $CuSiF_6 6H_2O$ = 313 72 Bl octahedral crystals, d 2 207, soluble in wat Used for coloring and hardening marble, as disinfectant and a plant spray **c forma** $Cu(HCOO)_2$ = 153 6 Blue monoclinic cr tals, d 1 830, soluble in water **c hydroxi** $Cu(OH)_2$ = 97 6 Blue crystals or blue powd d 3 368, decomp on heating, insoluble in wa but soluble in alcohol or ammonia **c hyp sulfite** C thiosulfate **c iodide** CuI_2 317 3 A dark-brown powder, soluble in wa or alcohol **c ion** The divalent ion, Cu^{++} **lactate** $Cu(C_3H_5O_3)_2 2H_2O$ = 277 6 Blue green crystals, slightly soluble in water alcohol **c nitrate** (1) $Cu(NO_3)_2 3H_2O$ 241 6 Blue, prismatic crystals, d 2 174, m 114 5 Decomp 170, soluble in water alcohol, used as a reagent for detecting oxyg as an astringent and alterative, and in t preparation of photosensitive papers $Cu(NO_3)_2 6H_2O$ = 295 7 Blue crystals, 2 047, m 26 4, decomp on heating, very solul in water or alcohol Used as (1) **c nitri** $Cu(NO_3)_2$ = 155 6 A green powder of varia

composition, readily decomp , soluble in water or alcohol **c nitroprussiate** $CuFe(CN)_5(NO)$ = 279 6 A grayish-green, granular photosensitive powder, insoluble in water **c nucleinate** Cuprol A green powder, soluble in water, used as an astringent **c oleate** $Cu(C_{18}H_{33}O_2)_2$ = 626 2 A dark-green or bluish-green waxy solid, insoluble in water, soluble in ether It is an antiseptic used in ointments and in the treatment of ring-worm **c oxalate** $Cu(OOC)_2$ = 151 6 A bluish-green powder, insoluble in water, soluble in dilute acids **c oxide** CuO = 79 6 A black monoclinic or regular crystalline powder, d 6 4, m 1064, insoluble in water, soluble in ammonia or potassium cyanide solution Used as a reagent in elementary analysis (granulated), medicinally as a teniafuge and in ointments, technically in ceramics, glass industry, and porcelain industry for the production of blue and green colors **c oxychloride** $CuO\,CuCl_2$ = 214 1 A bluish-green powder, soluble in ammonia or acids, used as a green pigment **c palmitate** $Cu(C_{16}H_{31}O_2)_2$ = 594 2 A greenish-blue powder, m 115, insoluble in water, soluble in alcohol **c phosphate** $Cu_3(PO_4)_2\,3H_2O$ = 434 8 Rhombic, blue crystals, slightly soluble in water, soluble in ammonia or acids (**acid**) $CuHPO_4$ = 159 6 A bluish-green powder, insoluble in water, soluble in acids or ammonia An anti-tuberculotic, also used as a reagent for CO_2 in water **c phosphide** Cu_3P_2 = 252 8 A gray metallic powder, insoluble in water, soluble in nitric acid, used in the manufacture of phosphorus bronze **c potassium chlorate** $Cu(ClO_3)_2\,2KClO_3$ = 475 61 Green crystals, soluble in water **c potassium chloride** $CuCl_2\,2KCl\,2H_2O$ = 319 910 Greenish-blue crystals, soluble in water **c potassium cyanide** $Cu(CN)_2\,2KCN\,2H_2O$ = 281 74 Green crystals, soluble in water **c potassium ferrocyanide** $K_2CuFe(CN)_6\,H_2O$ = 371 60 A brownish-red powder, insoluble in water **c potassium tartrate** $K_2Cu(C_4H_4O_6)_2$ = 437 83 Blue scales, soluble in water **c rhodanide** C thiocyanate **c salicylate** $Cu(C_7H_5O_3)_2\,4H_2O$ = 409 7 Greenish-blue micro-crystalline needles, soluble in water or alcohol **c selenate** $CuSeO_4\,5H_2O$ = 296 8 Blue crystals, slightly soluble in water **c silicate** $CuSiO_3$ = 139 7 A bluish-green crystalline powder, insoluble in water **c silicofluoride** C fluosilicate **c sodium chloride** $CuCl_2\,2NaCl\,2H_2O$ = 287 44 Greenish-blue crystals, soluble in water **c stearate** $Cu(C_{18}H_{35}O_2)_2$ = 630 2 A light-blue, amorphous powder, insoluble in water or alcohol, soluble in chloroform, benzene, or turpentine, used as bronze for plaster **c subacetate** Verdigris, aerugo A greenish-blue powder, soluble in water, sparingly soluble in alcohol, and occurs in variable composition, the blue variety has the average composition $CuO\,Cu(C_2H_3O_2)_2$, while the green variety $CuO\,2Cu(C_2H_3O_2)_2$ Used in the manufacture of pigments (Schweinfurt green), as a mordant, and in cotton printing **c subcarbonate** $CuCO_3\,Cu(OH)_2$ = 221 2 C carbonate Blue monoclinic crystals or greenish, amorphous powder, d 3 88, decomp on heating, insoluble in water, soluble in ammonia or acids A reagent for detecting glucose, used medicinally as an astringent in ointments, internally as antidote for phosphorus, commercially as a pigment and in the paper industry **c sulfate** (**anhydrous**) $CuSO_4$ = 159 6 A white or grayish, amorphous powder, d 3 516, decomp 621, soluble in water Used to dehydrate liquids, *e g*, alcohol, and to detect traces of water, (*e g*, in ether), when it turns blue (**basic**) $CuSO_4\,3Cu(OH)_2$ = 452 40 A blue powder, slightly soluble in water (**crystalline**) $CuSO_4\,5H_2O$ = 249 71 Copper sulfate, Roman vitriol, blue vitriol, blue stone Blue, triclinic, transparent crystals, $d_{16°}$ 2 286, loses 4 mol H_2O at 110, and 5 mol at 250, soluble in 3 5 pts cold and 1 pt boiling water, insoluble in alcohol Used as a reagent for preparing Fehling, Purdy, Benedict, Lowe, and other reagents for detecting glucose, for testing peptones, albumin, urea, picric acid, etc , medicinally as a caustic, styptic, astringent, emetic, and alterative and as an external caustic (sticks), technically, in the dye industry and the manufacture of green and blue pigments, in electrolysis and galvanoplating, commercially for manufacturing sprays and disinfectants for plants **c sulfide** CuS = 95 6 A black powder or hexagonal microcrystals, d 3 98, insoluble in water, soluble in acids or ammonia, used as an antiparasitic paint for ship bottoms **c sulfite** $CuSO_3\,H_2O$ = 161 6 A greenish-blue crystalline powder, soluble in water **c sulfocarbolate** C sulfophenate **c sulfocyanide** C thiocyanate **c sulfophenate** $Cu(PhSO_4)_2\,6H_2O$ = 517 81 C sulfocarbolate, copper carbosulfate, copper phenylsulfonate, copper sulfophenylate Green crystals, soluble in water or alcohol, used as a bactericide and antiferment **c tannate** A brown powder of variable composition, resulting from treating tannin with cupric salts Insoluble in water, soluble in ammonia **c tartrate** $CuC_4H_4O_6\,3H_2O$ = 265 7 A green-blue powder, slightly soluble in water, soluble in alkalis, used as a reagent, for glucose **c thiocyanate** $Cu(SCN)_2$ = 179 6 C rhodanate A blue powder which is insoluble in water but soluble in ammonia **c thiosulfate** CuS_2O_3 = 175 6 A green-blue crystalline powder, sparingly soluble in water

cupricyanide A compound containing the divalent $Cu(CN)_4^{--}$ radical

cuprine $C_{11}H_7O_3N$ = 201 05 An alkaloid derived from cotarnine

cuprite Cu_2O Ruberite, ruby copper, tile ore A native cuprous oxide

cuprocupric A complex copper salt, which may be considered as a mixture of cuprous and cupric salts **c cyanide** $Cu_3(CN)_4\,5H_2O$ = 384 83 A green powder, insoluble in water, soluble in potassium cyanide solution

cuprocyanide A compound containing the trivalent $Cu(CN)_4^{---}$ radical

cuprohemol A compound of copper and hemol, used medicinally

cuprol A copper salt of nucleic acid

cupron α-Benzoin-oxime A quantitative precipitant for copper

cupronine $C_{20}H_{18}O_3N_2$ = 334 13 An alkaloid derived from cotarnine

cuprophane The transparent cellulose films made by the cuprammonium process Cf *rayon*

cuprosulfate A double salt of copper sulfate and another sulfate

cuprotungstite $CuWO_4$ A tungsten ore

cuprous Describing a compound of monovalent copper Cu—, generally less common, and less

stable than the corresponding cupric compounds. **c. acetylide.** CuC_2H_2O = 169.16. An amorphous red powder formed when acetylene is passed into a cupric solution; it explodes when dry. **c. bromide.** Cu_2Br_2 = 287.0. A brown powder, d.4.72, m.484, b. about 900, insoluble in water, soluble in acids. **c. carbonate.** Cu_2CO_3 = 123.5. A yellow powder, decomp. on heating, insoluble in water, soluble in acids or ammonia. **c. chloride.** Cu_2Cl_2 = 198.2. Resin of copper, native as nantokite. Greenish-white tetrahedral crystals, d.3.53, m.422, b. about 1000, insoluble in water or alcohol, soluble in acids or ammonia. It is a reagent in gas analysis, and for the detection of AsH_3 and SbH_3. **c. cupric cyanide.** Cuprocupric cyanide. **c. cyanide.** $Cu_2(CN)_2$ = 179.4. A colorless monoclinic or amorphous powder, decomp. at red heat, insoluble in water, soluble in ammonia or KCN solution. **c. fluosilicate.** Cu_2SiF_6 = 269.20. C. silicofluoride. A red powder. **c. hydroxide.** $Cu_2(OH)_2$ = 161.2. A yellow powder, insoluble in water, soluble in acids or ammonia. **c. hyposulfite.** C. thiosulfite. **c. iodide.** Cu_2I_2 = 381.0. A brownish-yellow crystalline powder, d_{15}°.-5.65, m.606, b. about 765, insoluble in water, soluble in dilute acids, tincture of iodine, or KI solution. Used as a pigment mixed with equal parts HgI_2, for indicating the temperature of frictioning parts of machines. **c. ion.** The monovalent ion, Cu^+. **c. oxide.** Cu_2O = 143.1. A brown or red granular powder, or regular crystals, d.5.88, insoluble in water, soluble in acids, ammonia water or KCN solution; used in ceramics and the glass industry for making red pigments and red glass. **c. phosphide.** Cu_3P = 221.71. A grayish, metallic powder insoluble in water, soluble in acids, used in the manufacture of phosphorus bronze. **c. potassium cyanide.** CuCN.3KCN = 285.1. A white, crystalline powder, soluble in water. **c. rhodanide.** C. thiocyanate. **c. sulfate.** Cu_2SO_4 = 223.20. A gray or white powder; readily decomp. by water. **c. sulfide.** Cu_2S = 159.2. A black powder or rhombic crystals, d.5.58, m.1100, insoluble in water, soluble in acids. It occurs native as chalcocite. **c. sulfite.** $Cu_2SO_3H_2O$ = 225.2. A brown crystalline powder, insoluble in water. **c. thiocyanide.** $Cu_2(CNS)_2$ = 243.4. C. sulfocyanate. C. sulfocyanide. C. rhodanide, c. rhodanate. A grayish-white powder, m.1080, insoluble in water, soluble in ammonia.

cuproxide. CuO. A native copper oxide.

cuprum. The Latin for copper. See *cupric.*

Cupuliferae. A family of trees comprising Betulaceae (birches) and Fagaceae (oaks, chestnuts, beeches), that yield a valuable wood and several drugs:

Quercus alba	white oak
Quercus species	nutgalls
Quercus robur	oak bark
Quercus suber	cork
Alnus serrulata	tag alder
Fagus ferruginea	American beech
Castanea vulgaris	chestnut
Betula lenta	sweet birch oil
Ostrya virginica	iron wood

Cf. *quercitron, fagin.*

curangin. $C_{49}H_{77}O_{20}$ = 973.63. Glucoside from *Curanga amara,* a Scrophulariaceae of Southern Asia. Febrifuge and vermifuge.

curare. Woorara, urari, curara, curari or Sou American arrow poison. A black, brittl resinoid extract of various *Strychnos* specie it is a paralyzant of the motor nerves, a contains the active principles curarine a curine.

curarine. $C_{19}H_{26}O_2N$ = 300.15. A crystalli alkaloid from curare, and a strong paralyzar **proto-** An alkaloid from curare. **pseud** Pseudocurarine. **tubo-** $C_{19}H_{26}ON_2$ = 314.2 An amorphous, brown alkaloid from curare.

curcas oil. An oil from the seeds of *Jatrop curcus,* Linn., or physic nut, from Siam a East Indies, d.0.919; used as a drying oil a an emetic and purgative.

curcin. A toxic albumin of Barbados nuts; t seeds of *Curcas purgans,* an Euphorbiace of the West Indies; it resembles ricin.

curcuma. Turmeric.

curcumene. A group of terpenes from the vol tile oil of the rhizomes of *Curcuma aromatica.*

curcumin. (1) $C_{10}H_{10}O_3$ = 178.08. A brownis yellow coloring matter of tumeric, the rhizor of *Curcuma longa.* Deep-yellow, highly lustro crystals, sparingly soluble in water, soluble alcohol or ether; used as an indicator fro pH 7.4 (yellow) to 8.6 (brown), as reagent f beryllium, and as a dye. (2) $C_{21}H_{20}O_6$ 368.16. *1.7*-bis-(*4*-hydroxy-*3*-methoxypheny *1.6*-heptadiene-*3.5*-dione*, $(MeO(HO)C_6H_3CH{:}CHCO)_2CH_2$. Orange yellow needl m.183, insoluble in water.

Marie Sklodowska Curie.

(Courtesy of Jour. of Chemical Education a Wide World Photos.)

curdling. The coagulation of milk.

curds. The precipitate obtained by coagulat of milk.

Curie, Irene. See *Joliot.* **C., Marie Sklodows** 1867–1934. A French chemist and physic noted as co-discoverer of radium, poloniu and radioactivity. **C., Pierre** 1859–1906. French physicist and husband of Madame noted as co-discoverer of radium. **C. elect scope.** A sensitive electroscope to determ minute amounts of radioactive substan **C. point.** The temperature above which molecular forces of magnetism of paramagn

bodies cease to exist **C therapy** Radium therapy **C unit** Curie

curie A unit of radioactivity, the amount of emanation from, or in equilibrium with one gram of pure radium 1 curie = 2.5×10^9 mache units It equals 0 663 mm^3 or 6.56×10^{-6} grams of emanation (radon) and maintains an air ionization of 2.75×10^4 e s u (0 92 milliampere) **micro-** The millionth part of a c , 10^{-6} curie **milli-** The one-thousandth part of a c , 10^{-3} curie **millimicro-** Is 10^{-9} curie Cf *eman, mache*

curiegraph A photograph of a tissue injected with a radium emanation

curiescopy The visual examination in a dark chamber on a radioscopic screen of the emanations emitted by the radium preparation injected into a tissue

curine $C_{18}H_{19}O_3N$ = 297 2 A paralyzant alkaloid from curare A colorless microcrystalline powder, m 161, soluble in water, alcohol, chloroform or dilute acids

curite $PbO_5\ UO_3\ 4H_2O$ A radioactive mineral, from the Belgian Congo

curled Describing typical growths of bacteria in parallel chains or weavy strands, as, anthrax colonies

current (1) Any stream or flow, as, electric c — a stream of electrons, blood c —a flow of blood through the blood vessels (2) Electric c which moves along a conductor, its unit is the ampere, q v , its quantity the coulomb, q v , its potential difference the volt q v **alternating-** (A C) A periodically reversed electric c **battery-** Same as galvanic c **d'Arsonval-** The high voltage discharge of a condenser through a wire solenoid, producing high frequency alternations Used therapeutically **direct-** (D C) A current whose direction is always the same, *e g* , a galvanic current **eddy-** The current set up around a conductor (see *eddy*) **Foucault-** Electrical currents induced in a mass of metal in a magnetic field of varying intensity **galvanic-** A current from a galvanic battery **high-frequency-** An alternating current changing its direction many times per second **induced-** The current produced in an induction apparatus from the primary current **primary-** The current that produces an induced current **secondary-** Induced c

c breaker A device to interrupt the electric current, *e g* , a commutator, switch or rheotome **c changer** A device to reverse an electric current, *e g* , a commutator **c condenser** A device to store up electricity, *e g* , a condenser or accumulator **c density** See *density* **c regulator** A device to regulate electric current, *e g* , a rheostat

curry The powdered leaves of *Murraya koenigii*, a Rutaceae of India, sometimes flavored with other spices Used as curry powder for seasoning food and preparing the Indian national dish, curry

currying The incorporation of oil and grease into leather

Curtius, Theodor. 1857–1928 A German chemist, noted for organic syntheses **C reaction** The preparation of amines and urethanes by the action of water and alcohol on acid azides

curve A continuous line which is not straight or is made up of straight parts In the graphic diagram (coordinate system, q v) a line connecting points whose positions are defined by their abscissae and ordinates Hence it expresses a relationship **c analyser** A mechanical device consisting essentially of a table with two movable scales attached Used to measure tracings and curves

cuscamidine An amorphous alkaloid from cusco bark

cuscamine A crystalline alkaloid, m 218, from cusco bark

cuscus oil Vetiver oil

cuscohygrine Hygrine

cusco bark Red bark A variety of cinchona bark obtained from *Cinchona succirubra*, a Rubiaceae

cusconidine An amorphous alkaloid from cusco bark, pale-yellow masses

cusconine $C_{23}H_{26}O_4N_2$ = 394 3 An alkaloid, m 110, from cusco bark Cf *aricine*

cusp The point formed by the discontinuous join of two curves

cusparia bark Angostura bark

cusparidine $C_{19}H_{17}O_3N$ = 307 2 An alkaloid from angostura bark, the bark of *Cusparia officinalis* A fine white crystalline powder, m 78, sparingly soluble in water, soluble in acids

cusparine $C_{19}H_{17}O_3N$ = 307 14 *2*-Homopiperonyl-*4*-methoxyquinoline An alkaloid from angostura bark Colorless crystals, m 90, insoluble in water, soluble in alcohol, ether, chloroform, acetone or benzene

cusso Kousso

cut (1) The weight in pounds of resin added to each gallon of solvent Owing to the bulking and swelling of the solvent, the following relation exists

	4 lb cut	*6 lb cut*	*6 7 lb cut*
lbs resin in 1 gallon solution	2 86	3 75	4 00
gals solvent in 1 gallon solution	0 714	0 625	0 60

(2) A fraction of crude petroleum, q v

cutal Aluminum borotannate

cutch Catechu

cutic acid $C_{26}H_{50}O_6$ = 458 40 A fatty acid from cutin

cutin The fatty or waxy protective coating of plants

cutting (1) Etching (2) Lubricating (3) Mixing **c fluid** A liquid used to keep working parts cool, e g in drilling, milling, planing, sawing, tapping, threading Examples are soap water, mineral oil, emulsions, etc Cf *cut*

cuttle fish A mollusk, genus *Sepia*, of the order Cephalopoda, it discharges a pigment from a gland near the liver which furnishes painter's sepia

cwt An abbreviation for hundredweight

Cy Abbreviation for cyanide radical, CN—

cyamelide $C_3H_3N_3O_3$ = 129 05 *s*-Trioxanetriimine, $(HNCO)_3$ White amorphous powder, insoluble in water

cyamethine Cyanmethine

cyan Cy Cyano- The monovalent radical, —CN, see *cyanides* **di-** Cyanogen **hexa-** A cyclic polymer **iso-** The monovalent radical, —NC, see *isocyanides*

cyanacetic acid $C_3H_3O_2N$ = 85 09 Cyano-acetic acid, nitrilmalonic acid, carboxy-cyanmethane, CN CH_2 COOH Colorless crystals, m 70, b_{15mm} 108, decomp when further heated, soluble in water, alcohol or ether

cyanalcohol Cyanhydrin

cyanaldehyde C_3H_3ON = 69 02 Nitrilmalonaldehyde, $CN\,CH_2\,CHO$ Colorless crystals, soluble in water, alcohol, or ether

cyanamid Trade name for a mixture of 65–70 % calcium cyanamide and 15–20 % calcium hydroxide, with free carbon etc , used as fertilizer

cyanamide CN_2H_2 = 42 11 Cyanogen amide, amidocyanogen, carbamonitrile, carbamic acid nitril, urea anhydride, $NH_2\,CN$ or $NH\,C\,NH$ Colorless needles, m 46, soluble in water, alcohol or ether **allyl-** Sinamine **benzyl-** See *benzyl* **calcium-** CaNCN An intermediate in synthesizing ammonia from air **diethyl-** See *diethyl* **dimethyl-** See *dimethyl* **diphenyl-** Phenylcyan*anilide* **phenyl-** Cyananilide

c process A method of nitrogen fixation (1) Limestone and coke are heated in the electric furnace and form calcium carbide (2) Over the heated carbide (1000°C) a current of nitrogen passes and produces calcium cyanamide (3) $CaCN_2$ is treated in autoclaves by high-pressure steam and yields ammonia

cyanamil Cinnamyl cinnamate

cyananilide $C_7H_6N_2$ or $PhNHCN$ = 118 05 Phenylcyanamide, cyanilide, carbanilonitrile, *N*-cyanoanilne Colorless crystals, m 47, soluble in alcohol **phenyl-** $Ph_2N\,CN$ = 194 09 Diphenylcyanamide Colorless crystals, m 73

cyanate A salt of cyanic acid containing the monovalent —CNO radical **iso-** Carbimide A salt of isocyanic acid containing the monovalent —N C O radical **pseudo-** The radical —O N C **sulfo-** Thio- **tauto-** The radical —O C N **thio-** The radical —CNS

cyanation (1) The introduction of the —CN radical into a molecule (2) The formation of a nitrile

cyanaurite A double salt of a metal cyanide and aurous cyanide, $MAu(CN)_2$

cyanbenzilne $C_{24}H_{21}N_3$ = 351 20 $\mu\alpha$-dibenzoyl-β-phenyl-γ-amino-pyrimidine Colorless crystals, m 106

cyanbenzyl A compound containing the monovalent $CN\,CH_2\,C_6H_4$— radical, derived from alpha-benzyl cyanide **c cyanide** $C_9H_6N_2$ or $CN\,CH_2\,C_6H_4\,CN$ = 142 1 **ortho-** o-alpha-homophthalonitrile Colorless crystals, m 81 **meta-** m-alpha-homophthalonitrile Colorless crystals, m 88 **para-** p-alpha-homophthalonitrile Colorless crystals, m 100

cyancarbamic acid $C_2H_2O_2N_2$ = 86 02 Cyanamidocarbonic acid, $CN\,NH\,COOH$

cyancarbonic acid Cyanformic acid **c ester** $CN\,COOC_2H_5$ = 99 07 A liquid, b 115, soluble in alcohol or ether, insoluble in water

cyanconine $C_9H_{14}N_2$ = 150 10 Alpha-meta-diethyl-beta-methyl-pyrimidine, 2 6-diethyl-5-methyl-1 3-pyrimidine A colorless liquid, b 205

cyancoumarin $C_9H_5O_2\,CN$ = 161 05 3-cyanocoumarin Colorless crystals, m 182

cyanethine $C_9H_{15}N_3$ = 165 10 Alpha-meth ethyl-beta-methyl-gamma-amido-pyrimid 2 6-diethyl-5-methyl-4-amido-1 3-pyrimid Colorless crystals, m 189

cyanetholin Ethyl cyanate

cyanethylamide Ethyl cyanamide

cyanformate A salt of cyanformic acid cont ing the monovalent $CN\,COO$— radical

cyanformic acid $CN\,COOH$ = 71 03 A m basic acid known only as its salts, the c formates

cyanhematin A compound of hematin cyanogen

cyanhydride Cyanohydrin

cyanhydrin Cyanohydrin

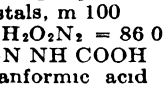
cyanic acid $HCNO$ = 43 06 Cyanhydro A colorless poisonous liquid d 1 140, w polymerises to cyamelide and fulminuric and from which the cyanates are deri **hydro-** HCN = 27 06 Prussic acid A c less poisonous liquid, $d_{18°}$ 0 697, m —11, b miscible with alcohol, water, or ether salts are the cyanides **iso-** $HNCO$ = 4 A monobasic acid from which the isocyan are derived **pseudo-** $HONC$ = 43 06 monobasic acid from which the pseudocyan are derived **pseudoiso-** Tauto- **sulfo-** Th **tauto-** $HOCN$ = 43 06 Pseudoiso-, fulm acid A monobasic acid, from which fulminates are derived **thio-** See *thiocy acid* **trihydro-** Cyanidine

cyanide A compound containing the monova radical, —CN, derived from hydrocyanic a **azo-** The radical —N N CN **chloro-** **cupri-** q v **ferri-, ferro-** See *ferricyanide, f cyanide* **hydro-** A compound containin HCN molecule, as R HCN **iso-** The m valent radical, —NC, derived from isocy acid, HNC **sulfo-, thio-** Thiocyanate

c process A method of extracting from ores by leaching with potassium cya solution

cyanidin $C_{15}H_{10}O_6\,HCl$ = 322 53 An an cyanidin, q v , from the flowers of *Centa* species and *Rosa gallica*

cyanidines (1) A group of compounds der from the hypothetical trihydrocyanic a They contain the trivalent radical, C_3N_3≡



(2) An anthocyanidin,

(3) *sym*-triazine, q v **diamido-** Formoguan **triphenyl-** Cyanphenine **trioxy-** Cyanuric a

cyanilide Cyananilide

cyanin. (1) $C_{27}H_{30}O_{16}$ = 610 23 A gluco from cornflower, rose and other flowers, wh hydrolyses to cyanidin (2) Anthocya A group of blue pigments found in cer flowers, as cornflower, iris, violet, etc **ca** Carbocyanin **iso-** Isocyanin **di-** See

CYANIN DYES

Kryptocyanin	1 1′-diethyl-4 4′-carbocyanin iodide
pinacyanol	1 1′-diethyl-2 2′-carbocyanin iodide
ethyl red	1 1′-diethylisocyanin iodide
quinoline red	1 1′-benzilidene-2 2′-quinocyanin chloride
cyanin	1 1′-diisoamylcyanin iodide
pinaverdol	1 6 1′-trimethylisocyanin iodide
α-pseudocyanin	1 1′-diethyl-4 4′-dimethyl-2 2′-carbocyanin bromide
α-dicyanin	1 1′-diethyl-2 4-dimethyl-2′4′—carbocyanin iodide
pinachrome	1 1′-diethyl-6-ethoxy-6′-methoxyisocyanin iodide
dicyanin	1 1′-diethyl-4 2′-dimethyl-6 6′-diethoxy-2 4′-carbocyanin iod
pseudodicyanin iodide	1 1′-diethyl-4 6 4′ 6′-tetramethyl-2 2′-carbocyanin iodide
pseudodicyanin bromide	1 1′-diethyl-4 6 4′ 6′-tetramethyl-2 4′-carbocyanin bromide

cyanine **phyco-** See *phycocyanin* **syn-** See *syncyanin*

c dyes A group of aniline dyes derived from cyanine, used in photography as sensitizers, *e g*,

cyanine (1) $C_{29}H_{35}N_2I$ = 538 1 Chinolin blue, quinoline blue, iodcyanin, *1 1'*-diisoamylcyanin iodide Green crystals with metallic luster, soluble in warm water or alcohol, used as an indicator and as a sensitizer in photography (2) Cyanin

c hydroiodide $C_{29}H_{35}N_2I\,HI$ = 665 9 Yellow needles which are soluble in water

cyanite Kyanite, rhoetzite Disthene The natural, blue or white, silicate $(AlO)_2SiO_3$, decomp above 1100°C to mullite and siliceous glass Cf *sillimanite, andalusite, mullite, fibrolite*

cyanmethine $C_6H_9N_3$ = 123 07 Cyamethine, α-meta-dimethyl-γ-amidopyridine, 2 6-dimethyl-4-amido-pyrimidine Colorless crystals, m 180

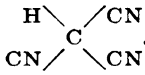
cyano The monovalent radical —CN, sometimes abbreviated Cy It acts like a halogen (forming cyanides) and forms, like ammonia, many complex salts **iso-** The radical —N C **thio-** The radical —NCS *isothio-* The radical —CNS **c salts** A group of addition compounds in which the cyano radical forms part of the complex ion, as, $ZnCy_3^-$, $ZnCy_4^{--}$, $CuCy_2^-$, $CuCy_3^{--}$, $NiCy_4^{--}$, $FeCy_6^{----}$ and $FeCy_6^{---}$

cyano aniline Cyananilide

cyanobenzene See *benzene*

cyanocarbonic acid Cyanformic acid

cyanoform C_4HN_3 = 91 032 Tricyanomethane, m 93



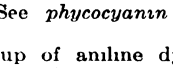
cyanogas A powdered calcium cyanide, used in fumigation and as rodent killer, being sprinkled in the mouth of the hole where the moisture of the earth causes the slow evolution of HCN gas

cyanogen (1) NC CN = 52 03 Cyan cyanide ethane dinitrile*, prussite, dicyanogen, oxalonitrile A colorless poisonous gas with the odor of bitter almonds $d_{(air)}$ 1 806, m −34, b −21, soluble in water, alcohol or ether (2) Originally the radical —CN **amido-** Cyanamide **bromo-** C bromide **chloro-** C chloride **di-** Cyanogen

c bromide NCBr = 106 01 Cyan bromide, bromine cyanide Colorless transparent needles, m 52, b 61, soluble in water, alcohol, or ether **c chloride** (1) NCCl = 61 50 Cyan chloride, chlorine cyanide A colorless and extremely poisonous gas or liquid, m −5, b 15, soluble in water, alcohol, or ether (2) Solid, $C_3N_3Cl_3$ = 184 43 m 145, b 190 **c disulfhydrate** $NH_2CS\,CS\,NH_2$ = 120 2 Rubeane **c halides** A group of compounds of the general formula NCX, in which X is a halogen They tend to polymerize to $N_3C_3X_3$ **c iodide** NCI = 152 9 Iodine cyanide Colorless needles, soluble in water, alcohol, or ether **c monosulfhydrate** Flavean hydride **c sulfide** $(CN)_2S$ = 84 1 Cyan sulfide Colorless rhombic scales, m 60, soluble in water, alcohol or carbon disulfide

cyanogenetic Yielding cyanogen, as, certain glucosides, amygdalin Cf *syncyanin*

cyanohydrin Cyan alcohol A compound that contains both, the —CN and —OH radical, as



in and **c synthesis** The addition of a carbon atom by the reaction $R\,HC{=}O + HCN \rightarrow R\,CHOH\,CN$ Cf *Wohl's reaction*

cyanol Aniline

cyanomaclurin (1) $C_{15}H_{12}O_6$ = 288 08 A tannin from the wood of *Arctocarpus integrifolia* Colorless crystals, m exceeds 290 (2) A synthetic anthocyanidin

cyanometer An instrument for comparing the shades of the sky

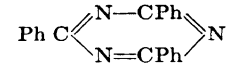
Cyanophyceae A group of blue algae See *phycocyanin*

cyanotype Blueprint

cyanoximide A compound containing the monovalent NC C(NOH)— radical

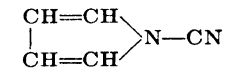
cyanoximido acetic acid NC C(NOH) COOH = 114 03 Colorless crystals, m 129 **c acetic ester** NC C(NOH)COOEt = 142 08 Colorless crystals, m 127

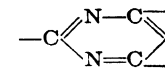
cyanphenine $C_3N_3Ph_3$ = 309 12 Triphenyl cyanidine



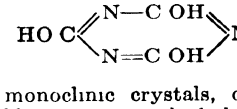
cyanphenyl Pseudo-*carbostyril*

cyanpyrrole C_5H_4N = 78 03 N-cyanpyrrole The heterocyclic compound

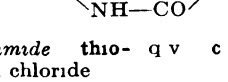


cyanur A compound containing the trivalent cyanidine ring  **c amide** C tetramide **c diamide** $C_3H_5ON_5$ = 127 3 Ammeline Colorless crystals, decomp on heating, insoluble in water, alcohol, or ether **c monoamide** $C_3H_4O_2N_4$ = 128 2 Ammelide Colorless crystals, insoluble in water, soluble in acids **c tetramide** $C_6H_6N_6$ = 126 3 Melamine, cyanuramide Colorless prisms, decomp on heating, sparingly soluble in water, or alcohol, insoluble in ether

cyanuric acid $C_3H_3O_3N_3\,2H_2O$ = 165 21 Pyrolithic acid, trioxycyanidine, *s*-triazine triol, trihydroxycyanidine, pyrouric acid, pyruric acid



Colorless monoclinic crystals, $d_0°$ 1 768, sparingly soluble in water, alcohol or ether Cf *cyanur, melem, melamide* **iso-** Tricarbimide The ketone form of cyanuric acid



Cf *mellimide* **thio-** q v **c chloride** Tricyanogen chloride

cyanuric ester A derivative of cyanuric acid containing the trivalent cyanur radical, $C_3N_3O_3\equiv$ **ethyl-** $C_3N_3(OEt)_3$ = 213 14 Colorless crys-

tals, m 29, b 275 **ethyliso-** $C_3O_3N_3Et_3$ = 213 14 Ethyltricarbimide Colorless crystals, m 96, b 276 **iso-** A derivative of isocyanuric acid, containing the trivalent isocyanur radical, $C_3H_3N_3\equiv$ **methyl-** $C_3N_3(OMe)_3$ = 171 10 Colorless crystals, m 135, b 263, soluble in alcohol **methyliso-** $C_3O_3N_3Me_3$ = 171 10 Methyltricarbimide Colorless crystals, m 175, b 296

cyanurin An indigo blue found occasionally in urine on the addition of an acid, it indicates indican

cybotactates Aggregates of molecules in liquids, generally oriented Cf *zones*

cybotactic Pertaining to end-to-end or side-to-side arrangements of molecules, as, in the case of octanol

$$Me(CH_2)_6CH_2OH \quad HOCH_2(CH_2)_6Me$$
n- (end-to-end)
$$Me(CH_2)_2CH_2OH(CH_2)_3Me$$
$$Me(CH_2)_2CH_2OH(CH_2)_3Me$$
4- (side-to-side)

In both cases the OH groups are held together by coordinate bonds Cf coordinate *bond, association*

cybotaxis The cubical space-arrangement of the molecules of non-crystalline substances

cyclamin Arthranitin

cyclamiretin $C_{15}H_{22}O_2$ = 234 2 A decomposition product of cyclamin

cycle (1) Any periodic repetition of a phenomenon, as, carbon cycle, nitrogen cycle, sulfur cycle, phosphorus cycle, etc (2) A ring or closed atomic chain, as, homocycle, heterocycle, carbocycle

cycleine $C_{27}H_{31}O_4N_2$ = 447 4 An alkaloid from *Cyclea peltata*, an East Indian Menispermaceae used for diarrhea and hemorrhoids

cyclic Arranged in a ring, *e g*, atoms Cf *acyclic, aromatic* **carbo-** A ring of carbon atoms, *e g*, benzene **di-** An atomic structure containing two rings, *e g*, as in naphthalene **hepta-** (1) An atomic structure containing seven rings (2) A ring of seven atoms, *e g*, tropine nucleus **hetero-** A ring composed of two or more different kinds of atoms, *e g*, pyridine **hexa-** (1) An atomic structure containing six rings (2) A ring of six atoms, *e g*, benzene nucleus **homo-** A ring composed of one kind of atom, *e g*, *carbo-* **mono-** An atomic structure containing one ring only, *e g*, benzene derivatives **penta-** (1) An atomic structure containing five rings, *e g* morphine (2) A ring composed of five atoms, *e g*, cyclopentane **poly-** An atomic structure containing two or more rings **tetra-** (1) An atomic structure containing four rings (2) A ring composed of four atoms, *e g*, cyclobutane **tri-** (1) An atomic structure containing three rings (2) A ring composed of three atoms, *e g*, cyclopropane

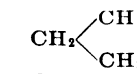
c action See *catalysis* **c compound** A compound that contains a ring of atoms, or a closed homocyclic or heterocyclic chain of atoms in its molecule See *rings* **c hydrocarbons** A compound of hydrogen and carbon, which contains a ring of carbon atoms, they may be unsaturated, cf *benzene series, cyclo-olefines*, or saturated, cf *cyclo-paraffins*

cyclite Benzyl bromide

cyclization Ring formation

cyclo- A prefix indicating a ring compound

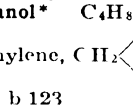
cyclobutane C_4H_8 = 56 1 Tetramethylene, q v, diethylene, tetrahydrobutene, cf *pucan*



nucleus A colorless gas, d_4° 0 7083, b 11 **ethyl-** C_6H_{12} = 84 1 A colorless liquid, d 0 740, b 72 **methyl-** C_5H_{10} = 70 1 A colorless liquid, b 39

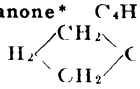
c carboxylic acid* See *alicyclic acids*

cyclobutanol* C_4H_8OH = 72 1 Hydroxy-tetramethylene,



A colorless liquid, b 123

cyclobutanone* C_4H_6O = 70 1 Ketotrimethylene,

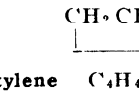


A colorless liquid, d 0 930, b 99

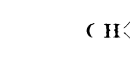
cyclobutene* C_4H_6 = 54 1 Δ^1-tetramethylene, cyclobutylene,

A colorless gas, b 3

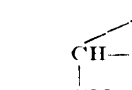
cyclobutyl The monovalent radical



cyclobutylene C_4H_4 = 52 1 Tetramethyl-diene, $\Delta^{1,3}$-tetramethylene, butene

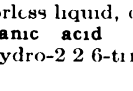


cyclofenchene $C_{10}H_{16}$ = 136 12 A tricyclic terpene,



A colorless liquid, d 0 861, b 144

cyclogeranic acid $C_{10}H_{16}O_2$ = 168 2 1 2 3 4-tetrahydro-2 2 6-trimethylbenzene carboxylic acid



A colorless crystalline substance, m 106

cycloheptadecene* Civetane

cycloheptadecenone* Civetone

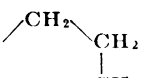
cycloheptane* Suberane

cycloheptanol* Suberol

cycloheptanone* Suberone

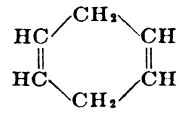
cycloheptene* C_7H_{12} = 96 09 Suberene, suberylene A colorless oil, d 0 8228, b 115, insoluble in water

cyclohexadiene* C_6H_8 = 80 06 Dihydrobenzene A group of partly saturated benzenes



1 2-dihydro-benzene
$\Delta^{3,5}$-cyclohexadiene
d_{20}° 0 848, b 78 5

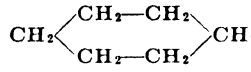
1 3-dihydro-benzene
$\Delta^{2(4),5}$-cyclohexadiene
d 0 842, m −98, b 80 5



1 4-dihydrobenzene
$\Delta^{2\,5}$-cyclohexadiene
$d_{22°}$ 0 847, b 85 5

cyclohexan-diol Cyclohexanediol

cyclohexane* C_6H_{12} = 84 13 Hexamethylene, hexanaphthene, hexahydrobenzene,



A colorless hydrocarbon occurring in Austrian and Caucasian petroleum, d 0 780, m 6 4, b 81, insoluble in water, soluble in alcohol or ether **dimethyl-** C_8H_{16} = 112 1 **1 2-** Hexahydro-o-xylene A colorless liquid, d 0 773, b 124 **1 3-** Hexahydro-m-xylene A colorless liquid, d 0 771, b 120 **1 4-** Hexahydro-p-xylene A colorless liquid, d 0 769, b 119 **ethyl-** C_8H_{16} = 112 1 Hexahydroethylbenzene A colorless liquid, d 0 777, b 132 **hexahydroxy-** See *inosite, phenose* **hydroxy-** Cyclohexanol **isopropyl-4-methyl-** $C_{10}H_{20}$ = 140 2 p-menthane, $Me_2CH\,C_6H_{10}\,Me$ A colorless liquid, d 0 748, b 167 **methyl-** Hexahydrotoluene **pentahydroxy-** See *quercitol, pinite* **propyl-** C_9H_{18} = 126 1 Hexahydropropyl-benzene A colorless liquid, d 0 767, b 140 **tetramethyl-** $C_{10}H_{20}$ = 140 2 Hexahydrodurene A colorless liquid, d 0 785, b 161 **trihydroxy-** Phloroglucitol **trimethyl-** C_9H_{18} = 126 2 **1 2 4-**Hexahydro-Ψ-cumene A colorless liquid d 0 778, b 142 **1 3 5-** Hexahydromesitylene A colorless liquid, d 0 772, b 137

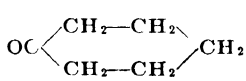
cyclohexanediol* **1 2-** Hexahydrocatechol **1 3-** See *quinitol* **1 4-** See *quinitol*

cyclohexanehexol Inositol

cyclohexanepentol* Quercitol

cyclohexanol* $C_6H_{11}OH$ = 100 1 Hexahydrophenol, hexalin, PhH_6OH Colorless crystals, or liquid, d 0 945, m 15, b 158 Used as a solvent for gums, waxes, rubber and nitrocellulose, also as an emulsifier in detergents **trimethyl-** $C_9H_{18}O$ = 142 1 A liquid, b_{760mm} 198, soluble in most organic solvents or oils, used as a mutual solvent for water-immiscible liquids

cyclohexanone* $C_6H_{10}O$ = 98 1 Pimelinketone, ketohexamethylene



A colorless liquid, b 155, used as a solvent, and in organic synthesis **2-methyl-** $C_7H_{12}O$ = 112 1 A colorless liquid, b 166 **3-methyl-** A colorless liquid, b 164 **4-methyl-** A colorless liquid, b 163 **2 4 5-trimethyl-** $C_9H_{16}O$ = 140 1 A colorless liquid, b 191 **3 5 5-trimethyl-** Dihydroacetophenone A colorless liquid, b 189

cyclohexatriene Benzene

cyclohexene* C_6H_{10} = 82 1 Tetrahydrobenzene, naphthylene, Δ^1-hexamethylene A colorless liquid, d 0 8102, m −103 7, b 83 Cf *carveol, dambonite* **c trione*** Uramoid

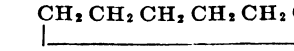
cyclohexenol* $C_6H_{10}O$ = 98 1 Tetrahydrophenol, Δ^3-cyclohexenol, Δ^3-hydroxy-cyclohexene A colorless liquid, b 163

cyclohexenyl The monovalent radical, C_6H_9—, derived from cyclohexene There are 3 isomers

cyclohexyl* The monovalent radical, C_6H_{11}—, derived from cyclohexane **bi-** $C_{12}H_{22}$ = 166 2 Dodecahydrodiphenyl, C_6H_{11}—C_6H_{11} Colorless liquid, d 0 864, b 240

c diethanolamine An emulsifying agent

cyclohexylidene The bivalent radical



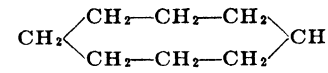
derived from cyclohexane

cyclol The hypothetical structure of globular proteins, viz a space-enclosing arrangement of diazine and triazine rings

cyclononane C_9H_{18} = 126 2 A colorless liquid, d 0 769, b 170

cyclo-octadiene C_8H_{12} = 108 1 A hydrocarbon constituent of rubber **1 5-dimethyl-** $C_{10}H_{16}$ = 136 1

cyclo-octane C_8H_{16} = 112 1 Octomethylene,



A liquid hydrocarbon, d 0 835, m 9 5, b 148

cyclo-octotetraene C_8H_8 = 104 1 Octomethyl-tetra-ene A yellow liquid, $d_4°$ 0 943, m −27, b about 40

cyclo-olefine A partly-saturated carbocyclic compound, or a ring-compound with double bonds and $=CH_2$ groups General formula, C_nG_{2n-2}

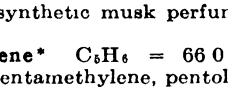
cyclopropene*	C_3H_4
cyclobutene*	C_4H_6
cyclopentene*	C_5H_8
cyclohexene*	C_6H_{10}
cycloheptadecene*	$C_{17}H_{32}$

cycloparaffin Polymethylenes, naphthenes A completely saturated carbocyclic compound, or a ring consisting of $=CH_2$ groups Their general formula is C_nH_{2n}

cyclopropane*	C_3H_6
cyclobutane*	C_4H_8
cyclopentane*	C_5H_{10}
cyclohexane*	C_6H_{12}
cycloheptane*	C_7H_{14}
cyclooctane*	C_8H_{16}
cyclononane*	C_9H_{18}

cyclopentadecanone* $C_{15}H_{28}O$ = 224 2 Exaltone A synthetic musk perfume **3-methyl-** Muscone

cyclopentadiene* C_5H_6 = 66 0 Cyclopentylene, $\Delta^{1\,3}$-pentamethylene, pentol,



A colorless liquid, b 41 **methylene-** Fulvene **pantamino-** Pentaminopentol

cyclopentamethylene Cyclopentane

cyclopentane* C_5H_{10} = 70 1 Pentene, pentamethylene

A hydrocarbon in Russian and Caucasian petroleum A colorless liquid, d 0 756, m −95, b 50 5 **diethyl-** C_9H_{18} = 126 2 1 3-diethyl-penta-methylene A colorless liquid, b 93 **dimethyl-** C_7H_{14} = 98 1 There are three isomers 1 1- (b 83), 1 2- (b 92), and 1 3- (b 91) **ethyl-** C_7H_{14} = 98 1 A colorless liquid, b 101 **methyl-** C_6H_{12} = 84 1 A colorless liquid, d 0 748, m 141, b 72 5 **pentaketo-** Leuconic

acid trimethyl- C_8H_{16} = 112 1 A colorless liquid, d 0 771, b 114

c acetic acid $C_5H_{10}CH_2COOH$ = 129 1 A colorless liquid, b 140 **c carboxylic acid***. See *alicyclic acids* **c formic acid** $C_5H_{10}COOH$ = 115 1 A colorless liquid, b 214

cyclopentanol* $C_5H_{10}O$ = 86 1 Hydroxypentamethylene, $CH_2<\begin{matrix}CHOH\\CH_2—CH_2\end{matrix}>CH_2$ A colorless liquid, d 0 939, b 139

cyclopentanone* C_5H_8O = 84 1 Adipinketone, ketopentamethylene, $CH_2<\begin{matrix}CO\\CH_2—CH_2\end{matrix}>CH_2$ A colorless liquid, b 130

cyclopentene* C_5H_8 = 68 1 Δ^1-pentamethylene, $CH_2<\begin{matrix}CH_2\\CH\ CH\end{matrix}>CH_2$ A colorless liquid, b 45 Cf *camphoceenic acid*

trimethyl- Laurolene

c tridecoic acid Chaulmoogric acid **c undecylic acid** Hydnocarpic acid

cyclopentenone* C_5H_6O = 82 1 The homocyclic compound $OC<\begin{matrix}CH_2\\CH\ CH\end{matrix}>CH_2$

cyclopentenyl The monovalent radical, C_5H_7—, derived from cyclopentene

cyclopentyl The monovalent radical, C_5H_9—, derived from cyclopentane

cyclopentylene Cyclopentadiene

cyclophenylenmethylene $C_6H_4\ CH_2$ **c oxide** C_7H_6O = 106 1 The heterocyclic compound $C_6H_4<\begin{matrix}O\\CH_2\end{matrix}>$

cyclopia A Leguminosae of South Africa *C vogelii* furnishes bush tea, used for lung disorders **c fluorescin** $C_{14}H_{18}O_{12}$ = 378 4 A pigment from *C genistoides* **c red** $C_{25}H_{32}O_{10}$ = 492 25 A pigment from *C genistoides*

cyclopin $C_{25}H_{28}O_{13}$ = 536 3 A glucoside from the leaves of *Cyclopia* species or bush tea from Cape Colony

cyclopropane* C_3H_6 = 42 1 Trimethylene, propene $CH_2<\begin{matrix}CH_2\\CH_2\end{matrix}>CH_2$ A colorless gas, m −126, b −35, insoluble in water, soluble in alcohol or ether, used as a general anesthetic **benzoyl-** See *benzoyl* **dimethyl-** C_5H_{10} = 70 1 $CH_2<\begin{matrix}CMe_2\\CH_2\end{matrix}>CH_2$ A colorless liquid, d 0 664, b 21, **ethyl-** C_5H_{10} = 70 1 A liquid, d 0 683, m 21, b 36 **methyl-** C_4H_8 = 56 1 A colorless gas, b 4 **trimethyl-** C_6H_{12} = 84 1 1 1 2-trimethyl-trimethylene A colorless liquid, d 0 679, b 57

c carboxylic acid* See *acyclic acids*

cyclopropene* C_3H_4 = 40 1 Δ^1-trimethylene, cyclopropylene $CH<\begin{matrix}CH_2\\CH\end{matrix}>$

dihydro- Cyclopropane

cyclopropyl The monovalent radical, $CH_2\ CH_2\ CH—$,

derived from cyclopropane

cyclopropylene Cyclopropene

cyclopterin A protein derived from the sperm of the lump-sucker, *Cyclopterus lumpus*

cyclotrimethylene sulfone $C_4H_6O_6S_3$ = 246 1 The heterocyclic compound $SO_2<\begin{matrix}CH_2—SO_2\\CH_2—SO_2\end{matrix}>CH_2$

cyclotron A device to produce high speed gas atoms for nuclear bombardments, *q v* Cf *rumbatron*

cydonin $C_{18}H_{28}O_{14}$ = 468 3 A gum or mucilaginous carbohydrate from quince seeds, *Cydonia vulgaris*

cylinder A glass tube, closed at one end and used to hold liquids for hydrometric determinations or the performance of lecture experiments **filter-** A c made of porous material used to filter solutions **graduated-** A c with a scale to measure liquids or gases **steel-** A c made of steel, used to ship compressed gases (see Table)

STEEL CYLINDER SIZES (U S A)

	B	C	D	E	F	G	H
diameter, in	3¼	4¼	4½	4½	5½	8½	9
height, in	16	18	20	29	55	55	55
content, in ^{3}	90	142	177	288	930	2,380	2,660
content, cm ^{3}	1,474	2,326	2,900	4,723	15,252	39,032	43,624

cylindrite $Pb_3FeSn_4Sb_2O_{14}$ A dark-gray tin ore

cymarigenin $C_{23}H_{30}O_5\ H_2O$ = 404 03 A split product of cymarin, resembling digitoxigenin and bufotalin and identical with apocynamarin

cymarin $C_{30}H_{48}O_{10}$ = 568 35 A glucoside from the leaves and rhizome of *Apocynum cannabinum*, which hydrolyzes to cymarigenin and cymarose Colorless prisms, m 135–140, slightly soluble in water, soluble in alcohol or ether, and therapeutically similar to strophanthin Cf *apocynamarin*

cymarose $C_7H_{14}O_4$ = 162 08 Digitose-methyl ether A sugar, m 91, from cymarin

Cymbopogon A genus of aromatic grasses, sometimes included in *Andropogon*, q v.

cymene $C_{10}H_{14}$ = 134 17 p-isopropyl-toluene, 1-methyl-4-isopropyl-benzene A constituent of the oils of eucalyptus, cumin, and thyme A colorless liquid, $d_{16}°$ 0 860, m −23 5, b 176, insoluble in water, miscible with alcohol or ether **o-** b 157 **m-** m 25, b 175–176 **hexahydro-** Menthane **hydroxy-2-** Carvacrol **3-** Thymol

c alcohol $C_{10}H_{14}O$ = 150 16 7-Cymol An isomer of carvacrol

cymenol Carvacrol

cymenyl Cymyl The monovalent radical, $C_{10}H_{13}$— derived from cymene

cymic acid $C_{11}H_{14}O_2$ = 178 1 A monobasic acid derived from cymene

cymidine $C_{10}H_{15}N$ = 149 2 Amino-cymene, carvacrylamine, *2-p*-cymylamine, *2*-amino-*p*-cymene, $Me_2CH\ C_6H_3MeNH_2$ A colorless oil, d 0 994, m −16, b 241

cymograph Kymograph

cymol 2- Carvacrol **3-** Thymol **7-** Cymene alcohol

cymyl Cymenyl **2-p-** Carvacryl **3-p-** Thymyl

cynapine An alkaloid from *Aethusa cynapium* or fool's-parsley, an Umbelliferae It forms colorless crystals

cynoctonine $C_{36}H_{34}O_{13}N_2$ = 702 28 An amorphous alkaloid, m 137, from *Aconitum septentrionale*, a Ranunculaceae

cynodine An alkaloid from the root of *Cynodon dactylon* a Gramineae, dog's-tooth, Bermuda grass or the dooba (doob grass) of India

cynoglossine An alkaloid from the root of hound's tongue or *Cynoglossum officinale*, a Boraginaceae

cynotoxin $C_{20}H_{28}O_{16}$ = 524 3 \ colorless crystalline principle from *Apocynum cannabinum*

cynurenic acid $C_{20}H_{14}O_6N_2\,2H_2O$ = 395 14 Oxychinolin carbonic acid A protein split-product found in dog's urine

cynurine $C_{18}H_{14}O_2N_2$ = 300 2 Colorless crystals A base derived from cynurenic acid by heating it to about 260°C

cyopin Coloring matter of blue pus Cf *pyocyanin*

cyperone $C_{15}H_{22}O$ = 218 18 A sesquiterpene ketone from the oil of *Cyperus rotundus*

cypral $C_{12}H_{20}O$ = 180 15 An aldehyde from cypress oil

cypress oil Oleum cupressi An essential oil from the leaves of *Cypressus sempervirens* A pale-yellow, volatile liquid, $d_{15°}$ 0 88–0 89, $[\alpha]_D$ +4 to +18, it contains furfural, cypress camphor, d-pinene, d-camphene, d-sylvestrene, l-cadinene, and cymene Cf *cupressin, cypressene*

cypressene $C_{15}H_{24}$ = 204 19 A hydrocarbon from cypress oil, d 0 9647 Cf *cupressin*

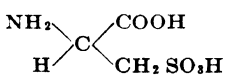
cyprinin A protamin derived from the carp, *Cyprinus carpio*

cypripedium Lady's-slipper The dried rhizome and roots of *C pubescens* or *C parviflorum*, American valerian, an Orchidaceae It contains an essential oil and an acid, used medicinally

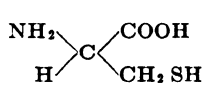
cypripedoid The combined principles from the root of *Cypripedium pubescens*, or lady's-slipper It is a tonic, stimulant, antispasmodic and mild diaphoretic

cyprite Chalcocite

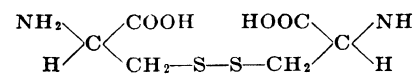
cysteic acid $C_3H_7O_5NS$ = 169 12 α-amino-β-sulfonic propionic acid



cysteine $C_3H_7O_2NS$ = 121 13 Amido-thiolactic acid, alpha-amino-beta-thiol-propionic acid, β-mercaptoalanine An aminoacid (q v) derived from cystine, and found in proteins and urinary calculi



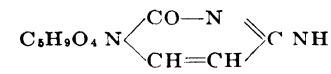
cystine $C_6H_{12}O_4N_2S_2$ = 240 26 o-diamido-propionic acid, $\beta\,\beta'$-dithiobisalanine, di-α-amino-β-thiopropionic acid An amino-acid, (q v) found particularly in keratin, and occasionally as minute hexagonal crystals in urine, and forming the chief sulfur-containing acid of proteins



cystopurin $(CH_2)_6N_4\,2NaC_2H_3O_2\,6H_2O$ A molecular compound of hexamethylene tetramine and sodium acetate

cytase (1) Alexin (2) A cytohydrolytic enzyme (q v) of the carbohydrase class

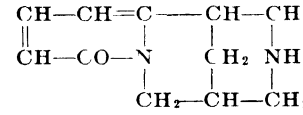
cytidine $C_9H_{13}N_3O_5$ = 243 13 Ribosyl-cytosine, cytosine-riboside Colorless needles, m 220, it is hydrolyzed by intestinal juice



c phosphoric acid $C_9H_{12}N_3O_5\,PO(OH)_2$ A pyrimidine nucleotide from cell nuclei Cf *solurol*

cytidylic acid A mononucleotide from yeast nucleic acid, composed of cytosine, d-ribose and phosphoric acid

cytisine $C_{11}H_{14}ON_2$ = 190 12 Ulexine, baptitoxine, sophorine Alkaloid from the seeds of *Cytisus, Laburnum* and *Ulex* species, Leguminosae Colorless crystals, m 152 soluble in water or alcohol, insoluble in ether or benzene



It is a local antiseptic and powerful diuretic Cf *anagyrine, sparteine*

c hydrochloride $C_{11}H_{14}ON_2\,HCl$ = 226 59 Colorless crystals, soluble in water, used hypodermically as a nerve tonic, **c nitrate** $C_{11}H_{14}ON_2\,HNO_3$ = 253 24 Yellow crystals, soluble in water, sparingly soluble in alcohol, insoluble in ether, used hypodermically as a nerve tonic

cytochemistry A branch of biological chemistry that deals with the chemical properties of living cells

cytochrome (1) The intracellular respiratory pigment Cf *chlorophyll, hemoglobin*, see table (2) A pigment of bacteria, (*e g*, tuberculosis and diphtheria) related to chlorophyll but containing Fe and Cu Cf *porphin ring*

c -c A red secondary pigment from meat

NATURAL PIGMENTS

Pigment	*Color*	*Metal*	*Occurrence*
chlorophyll	green	Mg	plants
hemoglobin	red	Fe	vertebrata
hemocyanin	blue	Cu	crustaceae
hemosycotopin	blue	Cu, Zn	molluscs
chlorocruorin	green	Fe	worms
hemerythrin	red	Fe	worms
achroglobin	colorless	Mn	molluscs
pinnaglobin	colorless	Mn	molluscs

cytoclasis The destruction of living cells

cytoglobin A protein derived from white blood corpuscles

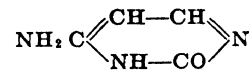
cytoligneous substances The vegetable (bacteria) or animal (erythrocytes, spermatozoa, tissues) cells that cause cytolysis in sero-reactions

cytology The science of the structure and activity of living cells

cytolysis The destruction or dissolution of living cells

cytoplasm The protoplasm of the cell body, excepting the nucleus

cytosine $C_4H_5ON_3$ = 111 07 2-oxy-6-amino-pyrimidine, 4-amino-2(1)pyrimidone,



A pyrimidine base derived from nucleic acid Colorless, thin plates, sparingly soluble in water

cytotoxin An antibody having a specific action on the cells of certain organs, *e g*, nephrotoxin

cytozyme Thrombokinase A substance of the body cells that causes coagulation of the blood (see *coagulen*)

Ð

D. (1) The symbol for deuterium, the hydrogen isotope of mass 2 = H^2. (2) An abbreviation for density of gases. $D_{(H_2)}$— Density compared with hydrogen gas taken as unity. $D_{(O_2)}$— Density compared with oxygen gas, taken as 32 (molecular weight). $D_{(air)}$— Density compared with air as unity. (3) The characteristic line of sodium. See *Fraunhofer lines.* (4) Abbreviation for diameter.

d. (1) Abbreviation for specific gravity or density of solids and liquids. d_4°= density at 4°C. d_{50}°=density at 50°C. d_c = critical density. (2) An abbreviation for dextro- or dextrorotary. (3) Differential, as in dy/dx.

d = dextro. *d*(*l*) = dextro- or levo-. (*dl*) = dextro-and levo-, *i.e.*, inactive.

δ. Greek letter, delta. (1) A symbol for the fourth carbon atom in a chain. (2) A *rate* of change, as in $\delta x/\delta y$.

Δ. Greek capital letter D. (1) A double bond, as Δ^1- between the first and second carbon atoms, $\Delta^{2,4}$- between the second-third and one between the fourth-fifth carbon atoms; $\Delta^{2(4)}$- a double bond between the second and fourth carbon atom. (2) Difference between two values, hence a *ratio;* as, $\Delta x/\Delta y$.

D.A. Blue cross.

dacite. An igneous rock in a class between the monzonite group and the quartz diorites; it consists chiefly of plagioclase, feldspar, mica and hornblende, and occurs in Yellowstone Park and at Mt. Lassen, California.

dacrene. $C_{20}H_{32}$ = 272.16. A diterpene from *Dacrydium biforme*, a Taxaceae, the mountain-pine of Australia and New Zealand.

dacryagogue. An agent that causes a flow of tears. Cf. *lacrimatory.*

dacryolin. The albuminous matter of tears.

dactylin. $C_{32}H_{28}O_{15}$ = 544.2. A glucoside from the pollen of orchard grass, *Dactylis glomerata*, and timothy, *Phleum pratense.* Pale yellow needles, m.184, readily soluble in hot water, slightly in cold water or alcohol.

-dag. Abbreviation-suffix for deflocculated Acheson graphite (see *graphite*).

Daguerre, Louis Jaques Mandé. 1789–1851. A French physicist and painter, noted as the inventor of the first photographic method. **D. process.** A polished silver plate is made light-sensitive by exposure to iodine vapor. The exposed surface coating of silver iodide is developed by means of mercury vapor and thiosulfate.

daguerrotype. A photograph made by Daguerre's process.

dahlia. A genus of composite plants whose bulbs yield inulin and a purple coloring matter. **d. paper.** A test paper impregnated with the coloring matter of d.; red with acids, green with alkalis. **d. violet.** See *pyoktanin.*

dahlin. (1) A purple aniline dye derived from mauveine. (2) Inulin.

dahllite. $Ca_6(PO_4)_4.CaCO_3$. A white, fibrous calcium phosphate-carbonate.

Dahl's acid. 2.5-Naphthylamine sulfonic acid. **D.a.II.** *1*-Naphthylamine-*4.6*-disulfonic acid. **D.a.III.** *1*-Naphthylamine-*4.7*-disulfonic acid.

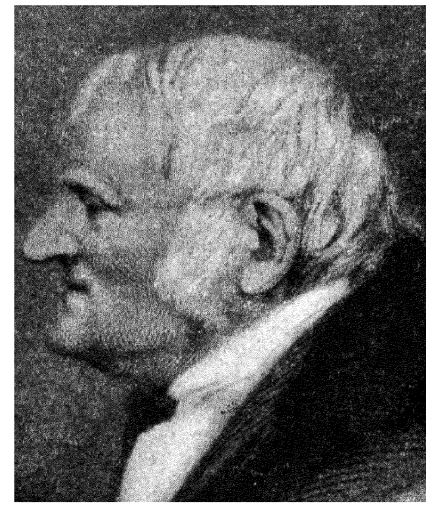
dahmenite. An explosive that consists of 91 % ammonium nitrate, 6.5 % naphthalene and 2.5 % potassium dichromate.

daidzin. A pigment from soy-bean meal, *Soja hispida*, which hydrolyzes to daidzein (7.4′-dihydroxy-isoflavone).

Dakin, Henry Drysdale. 1880– . An English-born American biochemist. **D. antiseptic.** Chlorazene. **D. solution.** A solution of 0.5 % sodium hypochlorite with sodium bicarbonate; used in the treatment and irrigation of infected wounds.

Daland hematocrit. A centrifuge attachment holding two graduated glass tubes for separating blood corpuscles.

Dalen Martens rubber testing machine. A device for testing the tensile strength and elasticity of rubber.



John Dalton.

(Courtesy of Jour. of Chemical Education.)

Dalton, John. 1766–1844. An English chemist, mathematician, and physicist, and founder of the atomic theory. **D's Law.** (1) The pressure of a gas mixture equals the sum of the partial pressures of the constituent gases. Cf. *Charles' law.* (2) Laws of proportion. See *proportion.* (3) Absorption of gases: The solubility of different gases in a mixture is unaffected by the presence of other gases so long as no chemical reaction occurs.

dalton. A unit of mass; $\frac{1}{16}$ of the mass of an oxygen atom, approximately 1.65×10^{-24} gram.

daltonide A name proposed for a chemical compound or chemical individual, as opposed to "berthollide" (q v) or alloy

damalic acid $C_{12}H_{22}O_2$ = 198 2 An acid in urine

damaluric acid $C_7H_{12}O_2$ = 128 1 An acid in urine

damar Dammar

damascenine $C_{10}H_{13}O_2N$ = 195 1 An alkaloid from the seeds of *Nigella damascena* (Ranunculaceae) $C_6H_2(OMe)(NHMe)COOMe$

dambonite $C_8H_{10}O_6$ = 202 1 p-dimethoxytetrahydroxybenzene $C_6(OH)_4(OMe)_2$ Colorless crystals from Gaboon caoutchouc

dambose $C_6H_{12}O_6\,2H_2O$ = 216 16 i-Inositol A sugar from caoutchouc Colorless, hexagonal prisms, m 220, soluble in water, insoluble in alcohol or ether

damiana The dried leaves of *Turnera diffusa*, (Turneraceae), a Mexican plant used as an aromatic nervine and tonic

dammar Dammara An oleoresin from various Coniferae of Asia, Australia, and South America resembling copal Yellowish or brownish masses, d 1 04–1 12, m 115–125, soluble in hot alcohol, chloroform, ether, or benzene, used in varnishes and plasters **true-** The resin obtained from *Dammara orientalis* of the East Indies, or *D australis* of New Zealand

dammarylic acid $C_{56}H_{90}O_8$ = 880 68 An acid in dammar

damourite An olivine rock consisting of a yellowish variety of muscovite

damping period The time needed for an excited electron to drop to the normal orbit and emit the characteristic radiations of the atom Cf *lingering period*

danain $C_{14}H_{14}O_5$ = 262 24 A glucoside from the root of *Danais fragrans*, a Rubiaceae of Madagascar

danaite (Fe,Co)AsS An iron-cobalt sulfo-arsenide

danalite $(Zn, Mn, Fe, Be)_7SSi_3O_{12}$ A rare zinc manganese iron beryllium silicate and sulfide

danburite $CaB_2Si_2O_8$ A pale-yellow, orthorhombic calcium borosilicate, d 2 95, hardness 7, dissolved by HCl

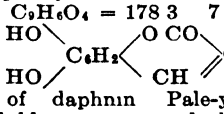
dandelion Taraxacum

Dangler burner A gasoline blast burner, temperature 1100°F

Daniell, John Frederic 1790–1845 An English chemist and physicist noted for electrical and meteorological investigations **D cell** A voltaic cell furnishing 1 08 volt and consisting of an amalgamated zinc electrode in dilute sulfuric acid (1 12) and a copper electrode in saturated copper sulfate solution Used in telegraphy

dannemorite A rare amphibole

daphnandrine $C_{36}H_{38}O_6N_2$ = 594 32 An alkaloid from the bark of *Daphnandra micrantha*, a Monimiaceae of Australia It is a cardiac and muscular paralyzant

daphnetin $C_9H_6O_4$ = 178 3 7 8-dihydroxycoumarin  A split-product of daphnin Pale-yellow crystals, m 255, soluble in water or alcohol

daphnin $C_{15}H_{16}O_9\,2H_2O$ = 376 2 A glucoside from the bark of *Daphne mezereum*, bay tree or laurel tree, a Thymelaceae Transparent prisms, m 200

daphniphylline An alkaloid from the leaves and bark of *Daphniphyllum bancanum*, an Euphorbiaceae of the Dutch East Indies It is a cardiac poison

daphnite $H_{56}Fe_{27}Al_{29}Si_{18}O_{121}$ A hydrous iron-aluminum silicate of the chlorite group

darak Tikitiki A high grade Philippine rice bran

darapskite $NaNO_3\,Na_2SO_4\,H_2O$ A native sodium nitrate and sulfate, found in the Chilean and California nitrate beds

D'Arcet metal (1) Mellot's metal An alloy of 8 pts Bi, 5 pts Pb, and 3 pts Sn, m 100, used for filling teeth and making plates (2) An alloy of 50 % Bi, 25 % Pb and 25 % Sn Used as the low melting alloy (m 94) in fire-sprinklers and fusible plugs

Dare hemoglobinometer An optical device for estimating the hemoglobin content of fresh undiluted blood

dari A grain similar to millet, used for the production of alcohol by fermentation

dasymeter An instrument for measuring the heat loss of a furnace by analysis of the waste gases

date palm An extensively cultivated palm Its fruit is used as food, its fiber for ropes, and its sap in making sugar

datiscetin $C_{15}H_{10}O_6$ = 286 1 A split-product of datiscin

datiscin $C_{21}H_{22}O_{12}$ = 466 2 A glucoside from the roots of *Datisca cannabina*, a Datiscaceae, used in fevers and stomachic troubles

dative bond See co-*valence*

datolite $2CaO\,B_2O_3\,2SiO_2\,H_2O$ A rare zeolite Colorless, grayish or greenish, monoclinic masses, d 2 9, hardness 5–5 5, sometimes used as a gem

Datura Thorn apple, Jamestown weed A genus of solanaceous plants, *e g*, *D stramonium* (see *stramonium*)

daturic acid Margaric acid

daturine Hyoscyamine *dl*-Atropine

daubreeite BiOCl An amorphous whitish native bismuth oxychloride

daubreelite $FeCr_2S_4$ A black, iron-chromium sulfide, in meteorites

daucine An alkaloid from the leaves of *Daucus carota*, wild carrot, an Umbelliferae, sometimes used as a diuretic

daughter cell A cell formed by division from a single cell (mother cell) Cf *karyokinesis*

daviesite A colorless, orthorhombic, native lead oxychloride

Davy, Sir Humphry 1778–1829 An English chemist who isolated sodium, potassium, barium, calcium, and strontium by electrolysis and devised the miners' safety lamp **D's lamp** See *miners'* lamp

davyum A supposed element in platinum ores (Cf *celtium*, *masurium*, *rhenium*)

dawsonite $NaAlCO_3(OH)_2$ A basic, aluminum-sodium carbonate, white, monoclinic crystals

day A unit of time **mean solar-** The average period from noon to noon, which consists of 1440 minutes = 86,400 seconds = 1 0027379 sidereal days **sidereal-** Consists of 86164 10 seconds, and is the interval between successive passages of a star through the meridian It is 3 minutes 55 91 seconds shorter than the solar day

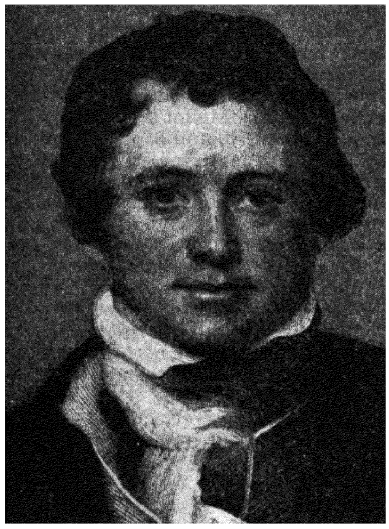
Db Symbol for dubhium, q v

D C Diphenyl dicyanarsine

DDNP. Abbreviation for diazodinitro phenol.

De. Symbol for dendbium, q.v.

de- A prefix indicating removal, (*e.g.*, of atoms, radicals or water), as, dehydro.



Sir Humphry Davy.

Deacon process. A method of making chlorine by oxidizing hydrochloric acid with atmospheric oxygen. The hot gases pass over a cuprous chloride catalyst.

deactivation. (1) Rendering inactive. The opposite of activation (*e.g.*, of a catalyst). (2) Loss of the radioactivity of a preparation.

dead. A molten alloy, as steel, which is quiet and does not evolve gas.

dealcoholizing. The removal of alcohol from liquids.

deamidation. The substitution of the amino group by another radical.

deamidizing. The splitting off of the amino group; *e.g.*, by enzymes (adenase, guanase).

deamination. The hydrolysis of amines, and the removal of the amino-group;

$$R.NH_2 + H_2O \rightarrow R.OH + NH_3.$$

oxidative-:

$$R.CHNH_2.COOH \rightarrow R.CO.COOH + NH_3$$

reductive-:

$$R.CHNH_2COOH \rightarrow R.CH_2.COOH + NH_3$$

deaminizing. The splitting off of ammonia from amino acids and proteins with the formation of the corresponding fatty acids.

deaquation. Dehydration.

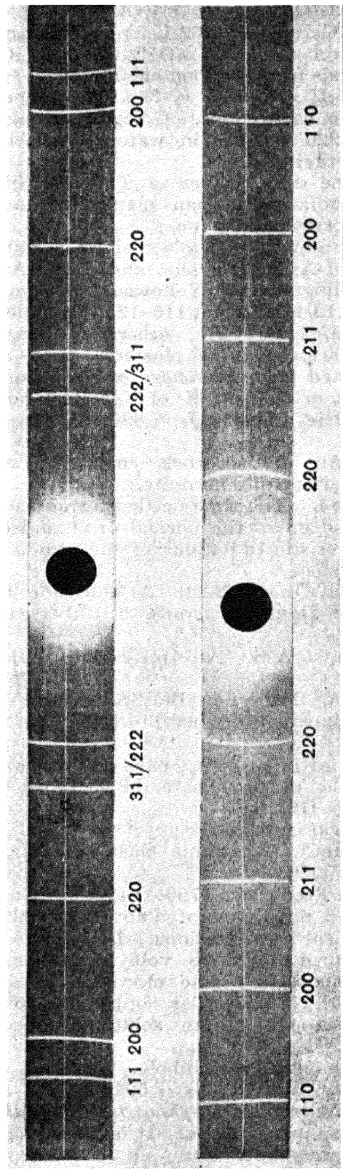
Debierne, André. 1874– . A French physicist, noted for work in radioactivity.

de Broglie. See *Broglie.*

Debye, Peter. 1884– . A Dutch physicist noted for research on crystal structure. **D. crystallogram.** A spectrum-like pattern produced by refracting monochromatic x-rays by a crystal. See figure. **D.-Hückel theory.** The distribution of ions; $n_{+(-)}$, in a small volume at distance r from a chosen ion is:

$$n_{+(-)} = ne^{\frac{-(+)r + (-)e\psi}{KT}}$$

where n is the number of molecules of salt in 1 cc., e the elementary electric charge, ψ the potential due to the chosen ion at distance r, K the Boltzmann constant and T the absolute temperature.



Debye crystallogram made with apparatus manufactured by Adam Hilger, Ltd., London, and showing the crystal structures of copper (top) and iron (bottom).

deca. The Greek for ten; a prefix to denote ten times. Cf. *deci.*

decagram. Ten grams or 154.32349 grains (0.35 ounce).

decahydronaphthalene. Dekalin.

decal process Decalcomania A transfer process for placing designs upon surfaces, from railroad cars to sausage casings It consists of making a lithographic print on specially prepared paper and transfering it to the surface by moistening the paper

decalcify To remove lime-salts from a tissue or bone

decalescent The absorption of heat, at a certain temperature, by a bar of steel during heating, due to allotropic changes Cf *recalescent* **d outfit** A device for determining the hardening temperature of high carbon steel, it consists of a crucible furnace, rheostat, high resistance pyrometer with decalescent couple

decalin Dekalin

decaliter Ten liters, or 10,000 cubic centimeters

decameter Ten meters, or 393 7 inches, or 32 8 feet

decanal $C_{10}H_{20}O$ = 156 2 Decylaldehyde $Me(CH_2)_8CHO$ A solvent

decane* $C_{10}H_{22}$ = 142 23 **normal-** The tenth hydrocarbon of the methane series A colorless liquid, $d_{20°}$ 0 730, m −30, b 173, insoluble in water, miscible with alcohol or ether **amino-** $C_{10}H_{23}N$ = 157 19 Decylamine*, $Me(CH_2)_9NH_2$ White crystals, d 0 951, m 17, b 218 **iodo-*** $C_{10}H_{21}I$ = 268 08 *n*-Decyliodide A colorless liquid, b_{15mm} 132

d carboxylic acid* Undecylic acid **d dioic acid*** Sebacic acid **d oic acid*** Capric acid **d diol*** $C_{10}H_{22}O_2$ = 174 17 Decamethyleneglycol, $CH_2OH(CH_2)_8CH_2OH$ White crystals, m 71 5, b_{11mm} 179 **d nitrile*** Capronitrile

decanoic acid* Capric acid

decanol* Decyl alcohol

decanone* $C_{10}H_{20}O$ = 156 16 **2-** The ketone $MeCO(CH_2)_7Me$ **5-** The ketone $Me(CH_2)_3CO(CH_2)_4Me$ Used as a solvent

decant To pour or syphon off a liquid layer

decantation A method of separating a sediment (liquid or solid) by pouring off the superimposed liquid layer

decarbonization To remove carbon

decarboxylating The splitting off of carbon dioxide from amino acids and proteins by bacterial action, with formation of amines (ptomaines)

decarboxylizing The removal of one or more carboxyl groups from the molecule of an organic acid, and its decomposition to carbon dioxide this is a property of some enzymes, *e g*, carboxylase of yeast

decarboxyrissic acid $C_{10}H_{12}O_5$ = 192 08 3 4-Methoxyphenoxy acetic acid Colorless crystals, m 116

decarburization Removal of carbon from iron and steel

decarburize Decarbonize

decatoic acid Capric acid

decatyl Decyl

decay (1) The progressive, chemical decomposition of organic matter in presence of atmospheric oxygen, generally due to aerobic bacteria Cf *putrefaction* (2) The progressive disintegration of radioactive substances Cf *disintegration, period of decay*

decene* $C_{10}H_{20}$ = 140 21 Decylene, octylethylene **normal-** Diamylene, octylethylene The unsaturated hydrocarbon $CH_2{:}CH(CH_2)_7Me$ A colorless liquid, $d_{0°}$ 0 763, b 172, insoluble in water, miscible with alcohol or ether

dechenite $PbV_2O_6(?)$ A rare lead vanadate, named after von Dechen, German mineralogist

decholin Trade name for dehydrocholic acid

deci The Latin for ten, used as a prefix to denote one-tenth Cf *deca*

decibel One-tenth of a bel, q v

decigram One-tenth of a gram, or 100 milligrams, or 1 54 grain

deciliter One-tenth of a liter, or 100 cubic centimeters or 3 38 U S fluidounces, or 3 52 English fluidounces

decimal A fraction of ten, or divided into ten parts

decimeter One-tenth of a meter or 10 centimeters, 3 937 inches

decimolar One-tenth of the molecular weight (in grams) **d solution** A solution containing, in one liter, one-tenth of a gram molecule, *e g*, a M/10 solution of sodium hydroxide contains 4 01 grams of sodium hydroxide per liter

decine $C_{10}H_{18}$ = 138 20 Decinene, decyne* **normal-** Octylacetylene, T^1-decine The unsaturated hydrocarbon $HC{:}C(CH_2)_7Me$ A colorless liquid **2-** Heptylmethylacetylene $MeC{:}C(CH_2)_6Me$

decinene Decine

decinormal One-tenth of the normal or equivalent strength **d solution** A solution containing, in one liter, one-tenth gram of the equivalent weight of a substance, *e g*, a N/10 solution of sulfuric acid contains 4 905 grams of sulfuric acid per liter

declination Deviation or bending, *e g*, magnetic declination is the variation of the compass needle from the true north

decoction A solution made by boiling the solute with the solvent Cf *infusion*

decoctum A soluble pharmaceutical preparation made by boiling vegetable drugs in water and straining

decoic acid Capric acid

decolorant An agent which absorbs or destroys a color

decoloration The staining or bleaching of colors by natural means

decolorization A process for bleaching or destroying a color artificially

decolorizing The removal or destruction of a color, *e g*, by charcoal or by a bleaching agent

decompose (1) To break down, split up, or analyze a substance (2) To rot

decomposition The breaking down of a substance or splitting it into simpler constituents **double-** Metathesis A chemical change in which two molecules exchange one or more of their constituents **hydrolytic-** The decomposition of substances, especially rocks, by water Cf *hydrolysis* **single-** Analysis A chemical change in which a molecule breaks apart into its constituents

d apparatus A device for the electrolysis of water **d of rocks** The disintegration of rocks following, in general, the successive stages of solution, hydration, disintegration, and mechanical sorting

decortication The stripping of the bark, hull or other outer layer from a plant, as of ramie, etc

decoylamide Caprylamide

decrepitate (1) To crackle (2) To roast a moist material

decrepitation The property of crystals, when heated, of flying apart with a cracking sound

decyl Decatyl The monovalent $C_{10}H_{21}$— radical, derived from decane **d alcohol** $C_{10}H_{22}O$ = 158 23 (**normal-**) Decatyl alcohol, nonylcarbinol, *1*-decanol*, $Me(CH_2)_8CH_2OH$ A colorless, oily liquid, $d_{20°}$ 0 830 m 7, b 231, soluble in alcohol **d aldehyde** Decanal **d amine*** Amino*decane* **d hydride** Decane

decylene Decene*

decylenic acid $C_{10}H_{18}O_2$ = 170 14 A constituent of butter, an unsaturated acid, m 0, b 142

decylethylene Dodecylene

decylic acid Capric acid

decyne* Decine

deduction (1) A conclusion drawn from established facts and data Cf *speculation* (2) An inference from general to particular Cf *induction*

deëlectronator An oxidizing agent

defecation The clarification of sugar solution in the sugar industry

defervescence The stoppage or cessation of boiling

defibrinated Made free of fibrin **d blood** A blood which has been d by shaking with lead-bullets, beating or chemical precipitation

definite proportions "The proportion of elements by weight is always constant for the same compound"

deflagration Sudden combustion, usually accompanied by a flame and crackling sound **d spoon** A metal spoon with long handle, used to burn substances in gases

deflect To turn from a straight course

deflocculation The removal of flocculation

deformability The property of a substance by which its shape, flow, or elasticity may be altered without rupture *E g*, pitch

defrother An agent which destroys or prevents foaming, as, butanol

degasification The elimination of gases from metals previous to coating or plating them with another metal

Degener's indicator Phenacetolin

degeneration The deterioration of cells or the loss of race-characteristics by an organism

degradation The conversion of an organic compound to a compound containing a smaller number of carbon atoms, as, R COOH → R H **energy-** See *thermodynamics* **mass-** See *mass-energy cycle*

degras A dark-brown grease from sheep wool, used in the leather industry and in the manufacture of lanoline

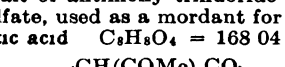
degreaser A solvent which removes fat or oil, as, dichloroethylene, methylene chloride, tetrachloroethane

degree A position or a unit, generally a difference in temperature (as, 6°C), density (as 6°B), or direction (as 6° angle) **d of freedom** Variance Each of the three variables pressure, temperature and specific volume, one or more of which must be fixed in order to define the state of a system See *phase rule* **d of hardness** The hardness (*q v*) of a mineral is indicated by its position in an arbitrary scale of comparison, as, *Moh's scale* **d of ionization** The percentage of ionized molecules in a solution **d of temperature** A division of the thermometer scale, (q v) usually expressed on the centigrade scale, °C

deguelin $C_{23}H_{22}O_6$ = 370 15 A constituent of cube Cf *rotenone, tephrosin*

deHaën salt $SbF_3(NH_4)_2SO_4$ = 310 8 A double salt of antimony trifluoride and ammonium sulfate, used as a mordant for textiles

dehydracetic acid $C_8H_8O_4$ = 168 04



Methylacetopyronone Colorless, rhombic scales, m 108, b 269 9, slightly soluble in hot water, alcohol, or ether **iso-** Dimethyl *coumalic acid*

dehydrant A therapeutic dehydrater, q v

dehydrated food Foodstuffs (*e g*, vegetables) from which water has been removed under conditions that reduce their bulk (for convenience of transport and storage) while maintaining their keeping properties On re-addition of the water the foodstuff returns substantially to its original state

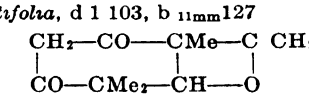
dehydrater (1) A device for drying tissues for histological work (2) Dehydrator A substance which removes water, as, alcohol, butanol C *desiccant*

dehydration (1) The process of removing water from compounds and crystals, *e g*, by heating (2) The process of removing hydrogen from organic compounds by reducing agents (dehydrogenation)

dehydrite A brand of magnesium perchlorate used as desiccant Cf *anhydrone*

dehydro- A prefix for an organic compound indicating the presence of less hydrogen, *e g*, dehydro-corydaline

dehydroangustione $C_{11}H_{14}O_3$ = 194 09 A bicylic diketone from the oil of *Backhousia angustifolia*, d 1 103, b $_{11mm}$127



Cf *angustrione*

dehydrocholic acid $C_{24}H_{34}O_5$ = 402 31 A split product of cholic acid, obtained by treatment with nitric acid

dehydrogenase A dehydrogenating enzyme in the cell walls of *B coli*

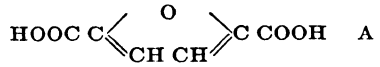
dehydrogenation The removal of hydrogen from organic compounds by reducing or oxidizing agents in presence of catalysts

dehydro-isodesoxycholic acid $C_{22}H_{28}O_6$ = 388 2 *β*-diketo cholanic acid An oxidation product of cholic acid

dehydrolysis The removal of hydrogen and oxygen in the proportions of water from organic substances, *e g*, cane sugar treated with sulfuric acid Cf *dehydration*

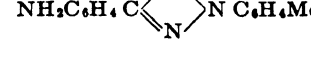
dehydrolyzing agents A chemical which extracts water from organic compounds, *e g*, sulfuric acid, phosphorus pentoxide, or zinc chloride Cf *desiccant*

dehydromucic acid $C_6H_4O_5$ = 156 0 Furfurane dicarboxylic acid, *2 5*-furan-dicarboxylic acid



A dibasic acid, colorless crystals obtained by dry distillation of mucic acid

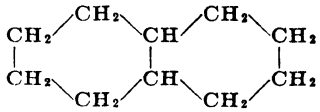
dehydrothiotoluidine $C_{14}H_{13}N_3S$ = 255 1 Aminobenzenyl-o-amino-thiocresol



Yellow needles, m 191, b 431, insoluble in water, soluble in alcohol or ether Its solutions have a violet fluorescence, used as a dye

dehydrothioxylidene $C_{16}H_{16}N_2S$ = 268 2 Aminotoluenyl-o-amino-thio-xylenol Yellow prisms, m 107, b 283, insoluble in water, soluble in alcohol Used as a dye

dekalin $C_{10}H_{18}$ = 138 2 Decalin, decahydronaphthalene, bicyclo(0 4 4)decane The saturated aromatic hydrocarbon



A colorless liquid, d 0 8947, b 192, miscible with alcohol or ether Used as a cleaning fluid, solvent, and substitute for turpentine and lubricating oil, also in perfumery Cf *tetralin*

de Khotinsky See *Khotinsky*

delcosine $C_{21}H_{33}NO_6$ = 395 3 An alkaloid, m - 198, isomeric with and occurring with deltaline in *Delphinium consolida*

delessite $(Mg,Fe)_4Al_4H_{10}Si_4O_{22}$ A green, hydrous, iron magnesium and aluminum silicate, related to chlorite

delineascope A projection apparatus consisting of a nitrogen-filled Mazda bulb, with a silvered glass reflector and slide carrier

deliquescence Gradual liquefaction by absorption of water from the atmosphere, as by calcium chloride Cf *hygroscopic*

deliquescent Becoming moist or liquefied after exposure to humid air Cf *hygroscopic*

deliriant A cerebro-spinal neurotic drug which produces confusion of will power and delirium, as, belladonna, cannabis, cocaine, fishberries, hyoscyamine, solanine, stramonium

delphin blue $C_{20}H_{17}O_6N_3S$ A blue aniline dye obtained by heating aniline with gallocyanin and sulfating

delphine Delphinine

delphinic acid An acid from the oil of *Delphinium* species, Ranunculaceae

delphinidin $C_{15}H_{10}O_7$ HCl = 338 53 An anthocyanidin, (q v) from the flowers of *Delphinium* species

delphinin $C_{41}H_{38}O_{21}Cl$ = 901 8 A glucoside from larkspur, *Delphinium consolida*, which hydrolyzes to delphinidin and p-hydroxybenzoic acid

delphinine $C_{22}H_{35}O_6N$ = 409 28 or $C_{34}H_{47}NO_9$ = 577 37 An alkaloid from the seeds of *Delphinium staphisagria*, a Ranunculaceae of Europe and Asia Minor Colorless crystals, decomp 120, soluble in alcohol, ether, or chloroform, used as an antispasmodic, anticonvulsive antineuralgic Cf *staphisagria alkaloids*

Delphinium A genus of Ranunculaceae, larkspurs, which yield staphisagria alkaloids, ajacine, delphinic acid, etc

delphinoidine $C_{22}H_{35}O_6N$ = 409 3 An alkaloid from the seeds of *Delphinium consolida* (larkspur), a Ranunculaceae of Europe and America

delphisine $C_{54}H_{46}O_8N_2$ = 850 5 An alkaloid from the seeds of *Delphinium staphisagria* (stavesacre), a Ranunculaceae

delphocurarine $C_{22}H_{33}NO_7$ = 435 3 An alkaloid, m 185, from the seeds of *Delphinium scopulorum* An amorphous, white powder resembling curare in effect Cf *delcosine*

delta The Greek letter δ or Δ δ is a symbol for (1) difference, or (2) the fourth carbon atom in a chain, Δ for double bond **d acid** δ-acid 2 7-Naphthylamine sulfonic acid **d metal** A tough alloy of 60 parts copper, 38 2 parts zinc and 1 8 parts iron

deltaline $C_{21}H_{33}NO_6$ = 395 3 An alkaloid, m - 180, from *Delphinium occidentale* Cf *delcosine*

delvauxite A hydrous ferric phosphate containing vanadium

demagnetization Any method by which an object is deprived of its magnetic properties

demal A solution containing one gram equivalent of solute per cubic decimeter (1 dm^3 = 1 000027 l) Used in place of *normal* in electrical conductivity measurements

demargarinate To separate, almost completely, the solid glycerides from an edible oil by cooling

dematoid A light green andralite (iron garnet, q v)

demethylation Removal of the methyl group

demi (French) Half See *semi* (Latin) and *hemi* (Greek) **d john** A glass storage vessel, similar to a carboy in shape but holding only 4 gallons

Democritus of Miletus [Gk Demokritos] 460–370 B C An early Greek philosopher of Abdera in Thrace, noted for his speculations on atoms and cosmology

demolization The purely physical dispersion of a molecular system produced by the action of highly superheated steam

demonstration The performance of experiments to prove a certain theory, law, or property, as, lecture experiments

demulcent An oily or mucilaginous drug, which soothes or protects an inflamed tissue, as, milk, glycerol, starch

denaturation (1) The addition of substances, harmful or inert, to a product such as alcohol or salt, by which it becomes unfit for human consumption (2) The production of suspensoid properties in albumins and globulins by certain reagents

dendrite (1) Dentrite A tree-like or arborescent crystalline structure, as, in geology the black or brown designs found in the joints and division planes of rocks (moss agate) They are due to the infiltration and subsequent evaporation of solutions of iron and manganese salts (2) A protoplasmic protuberance on a nerve cell

dendrobine $C_{16}H_{25}NO_2$ = 263 2 An alkaloid from Chin-shih-hu, a variety of *Dendrobium* (Orchideaceae), a tonic and antipyretic

dendrology Dating trees from their growth rings

denebium De A supposed element isolated in 1916 by Eder, identical with thulium, Tm, atomic number 69

denier The thickness of a thread or yarn expressed as the weight in grams of 9000 meters

Denigè's reagent A solution of 5 gm yellow mercuric chloride in 20 cc conc H_2SO_4 and 100 cc H_2O, used as test for citric acid

denitration The removal of nitrates from a material, as, the d of soils by growing plants

denitrification The removal of nitrogen from a material, *e g*, soil

denitrify To remove nitrogen or nitrates

Dennstedt furnace. An electrically heated combustion furnace for elementary organic analysis

densimeter A hydrometer

densi-tensimeter. An apparatus for the simultaneous determination of vapor pressure and vapor density.

densitometer. An optical device for measuring optical density *e.g.*, of a photographic plate. Cf. *absorptiometer.*

density. (1) In chemistry and physics, the weight of matter per unit volume of a substance. For solids and liquids: d. = spec. grav. For gases (M = molecular weight):

$D_{(air)}$ = d. in relation to air = 1.
$D_{(O_2)}$ = d. in relation to O_2 = 32 = M.
$D_{(H_2)}$ = d. in relation to H_2 = 1 = M/2.

Cf. *hydrometer* scales, normal and relative *density, specific gravity.* (2) In photography, the thickness of the image on an exposed plate, as measured photometrically. Cf. *optical* density. (3) In physics (*current-density*), the number of amperes passing per sq. cm. of an electrode. **limiting-** The density of a gas corresponding with the pressure at which it becomes an ideal gas and obeys Boyle's Law. The ratio of the limiting densities of two gases equals therefore, the ratio of their molecular weights. **normal-** The limiting density at atmospheric pressure, or the weight in grams of a liter of substance measured at N.T.P., the weights being reduced to sea-level at latitude 45°. **relative-** The weight of a volume of substance compared with that of a standard measured under the same conditions. For solids and liquids 1 cc. of water at 4°C. is the standard; for gases and vapors, an equal volume of hydrogen. **vapor-** The ratio of the weight of a given volume of a gas or vapor to that of the same volume of hydrogen measured at N.T.P. (1 cc. of hydrogen weighs 0.00009 gram). It follows from Avogadro's Law that the vapor density = ½ molecular weight.

Density comparator.

a. Projection system.
b. Photoelectric cell.
c. Spectrum negative.

d. comparator. A photoelectric densitometer, q.v. See figure. Cf. *microphotogram.*

d. fluids. A series of fluids for separating minerals by flotation; as,

d.5.3.....	thallium mercury nitrate solution
d.4.27.....	Clerici solution
d.3.5.....	Rohrbach solution
d.3.33.....	methylene iodide
d.3.17.....	Toulet's solution
d.2.97.....	acetylene tetrabromide
d.2.90.....	bromoform
d.1.94.....	ethyl iodide.

densograph. A curve showing the relation between the intensity of a source of illumination and the density of the image produced on a photographic plate.

dental alloy. A mixture of 66–69 % Ag, 5 % Cu, 0.5–1.7 % Zn and 26–26.5 % Sn, amalgamated with mercury. **d. cement.** A quick-setting mixture consisting of finely powdered (1) zinc oxide (= *zinc cement*), (2) copper oxide (= *copper cement*), or (3) aluminum calcium silicate (= *silicate cement*). This is mixed before use with orthophosphoric acid containing varying amounts of Al, Zn, and Na phosphates.

dentifrice. Toothpaste.

dentin. The hard substance of the teeth.

dentists' amalgam. An alloy of 70 parts mercury with 30 parts copper, used in dentistry.

dentrite. Dendrite.

denudation. Stripping or making bare. Cf. *erosion.* **chemical-** The loss of nutritive salts from the soil, and the progressive degeneration of agricultural land.

deodorant. An agent which removes, corrects, or represses undesirable odors.

deoxidation. Reduction, the removal of oxygen from a compound; or the lowering of the oxygen content, as in steel manufacture.

dephlegmator. Fractionating column.

dephlogisticated. An obsolete term which indicated the absence of phlogiston or the principle of inflammability. **d. air.** Oxygen, or airless phlogiston. **d. marine acid.** Chlorine.

depilating. In the leather industry, the removal of hairs and epidermis from hides.

depilatory. A drug or agent which removes superfluous hairs from the skin; *e.g.*, barium sulfide.

depolarization. The prevention or removal of polarization. **electrical-** The prevention of electrical polarization, *e.g.*, by separating the electrodes of an electric cell by a porous diaphragm. **optical-** The effect produced by placing a depolarizer between the analyzer and polarizer of a polarization apparatus.

depolarizer. An optical device refracting polarized rays into ordinary and extraordinary rays.

deposit. A collection of matter at any particular place; *e.g.*, geologic location, in test tubes (precipitate) or tissues, or on objects in an electrolytic bath.

deposition. The formation of a collection of matter; *e.g.*, sedimentation, incrustation, electroplating, or precipitation.

depressant. A cerebrospinal neurotic drug which diminishes the functional activity of an organ or organism; *e.g.*, arnica, antipyrine, cocaine, colchicine, hemlock, lobelia, phenacetin, tobacco.

depression. A lowering effect, *e.g.*, depression of the freezing-point of a solution by dissolved salts. **molecular-** The lowering of the freezing-

point of a solution containing a mole of a substance per liter Cf *Raoult's law, colligative*

depressor (1) A negative catalyst, q v (2) A buffer (3) A substance used in flotation to reduce the tendency of gangue materials to be carried along with the froth, as, cyanides, silicates, sulfites **d effect** The resistance of a solution to a change in hydrogen ion concentration Cf *buffer effect*

depsanone 1 2-dihydro-depsenone The heterocyclic compound, Ph C_6H_3<O, CH_2>CH_2

depsenone 4-benzoyl-benzofuran The heterocyclic compound, Ph C_6H_3<O, CH=>CH

depsides A group of ester-like anhydrides of phenol carboxylic acids, obtained from lichens or synthesised

depsiphore A structural arrangement of atoms that is common to many substances having the property of tanning agents Cf *chromophore*

derby red Basic *lead* chromate

derbylite An antimonio-titanate of iron

dericin A light colored, viscous oil derived from castor oil, used as a solvent for pharmaceuticals

derinatol Basic *bismuth* gallate

derivant Derivative

derivate Derivative

derivation (1) The preparation of an organic substance from another compound (2) The theoretical connection between the molecular structures of related organic compounds

derivative (1) A compound, usually organic, obtained from another compound by a simple chemical process, *e g* , acetic acid is a derivative of alcohol (2) An organic compound containing a structural radical similar to that from which it is derived, *e g* , benzene derivatives containing the benzene ring Beilstein classifies several types of d , according to the theoretical alteration of the compounds

(a) index compound	CH_3OH	PhOH
(b) coupling compound	$HOCH_3$	$HOSO_2OH$
1st degree d	CH_3OCH_3	$PhOSO_2OH$
2nd degree d	CH_3OCHCl_2	$PhOSO_2NH_2$
3rd degree d	—	$PhOSO_2NHCl$

Cf *anhydrosynthesis* **additive-** Additive compound **functional-** A d which contains a radical whose hydrogen is capable (theoretically) of further replacement Cf functioning *group* **nonfunctional-** A d which contains a radical without any replaceable hydrogen Cf nonfunctioning *group* **nuclear-** A d in which substitution took place on the carbon stem Cf stem *nucleus* **side chain-** A d in which substitution took place on the side chain, q v

derived units Units (q v) of physical measurements which can be deduced from fundamental units Thus, the fundamental unit of length, l, will give the unit of area, l^2, and the unit of volume, l^3, *e g* , m, m^2, and m^3

dermatitant A substance that irritates or inflames the skin, as, lobinol

dermatol Bismuth subgallate

dermatoscope A binocular microscope

dermatosome (1) The smallest fibre or fibril which can be detected microscopically (2) The small fibre debris produced by the action of HCl on cellulose

dermics A drug used for skin diseases

dermol $Bi(C_{15}H_9O_4)_3\ Bi_2O_3$ Basic bismuth chrysophanate Amorphous yellow powder used as antiseptic in skin diseases

derric acid $C_{10}H_{14}O_7$ = 243 09 An oxidation product of derrisic acid, m 170, soluble in water or alcohols

$$\begin{matrix} COMe{=}CH- & C\,CH_2COOH \\ | & \| \\ COMe{=}CH- & COCH_2COOH \end{matrix}$$

Cf *risic acid*

derrid An acid resin from *Derris elliptica*, a Papilionate of the East Indies, used by the Malays as an arrow poison

derrin An early name for rotenone

derris The leaves of *Derris uliginosa*, a Leguminosae of the South Sea Islands, used by the Fijians as fish poison It contains rotenone, toxicarol, deguelin and a series of acid resins and is not poisonous to man Cf *cube* **d extract** An infusion of d used as an aphicide ascaricide, fly spray and in flea powders **d root** Tuba root The dried root of *Derris elliptica*, a Leguminosae of Sumatra Borneo Straits Settlements, Java, and Sarawak, used in insecticides

derissic acid $C_{23}H_{24}O_8$(?) A constituent of derris root

derritol $C_{21}H_{24}O_6$ = 372 19 An alcohol derived from rotenone Yellow needles m 161

desalgin A colloidal solution of chloroform

desamidase An enzyme (q v) which splits off the $-NH_2$ group

desamidization Deamidization

desaulesite A rare nickel-magnesium silicate

Descartes, René (1596–1650) A French philosopher, physicist and chemist

desclizite $Pb,Zn_4V_2O_4\ H_2O$ A zinc-lead vanadate, occurring in greenish masses, d 6 1 hardness 3 5

desensitization (1) In photography rendering silver salts less sensitive to light by physical or chemical means (2) In biochemistry destruction of immune bodies

desensitizer A substance (*e g* , certain dyes) which render the photographic emulsion less sensitive, *e g* , pinakryptol Cf *sensitizer*

deshydro- A prefix, indicating containing less hydrogen, hence, unsaturated

deshydroxy- A prefix, indicating containing less hydroxyl **d cholic acid** A constituent of bile

desiccant An agent which dries, hence, a substance used to dry gases Weights of the residual moisture in one liter of saturated air at 25°C after passing through a U-tube containing the d are

Desiccant	*mg of water*
P_2O_5	practically none
$Mg(ClO_4)_2$	practically none
KOH	0 003
Al_2O_3	0 003
H_2SO_4(95 %)	0 003
MgO	0 008
$Ba(ClO_4)_2$	0 14
NaOH	0 16
CaO	0 2
$CaBr_2$	0 2
$CaCl_2$	0 36
$ZnCl_2$	0 8
$ZnBr_2$	1 1
$CuSO_4$	1 4

Other d are *ascarite, magnesium perchlorate, barium perchlorate* **chemical-** A d which acts by absorption, *e g*, reacts with water as, P_2O_5 **physical-** D which act by adsorption, as, silica gel, charcoal, asbestos

desiccated Describing a dried substance

desiccation The process of drying by means of a deliquescent or hygroscopic substance

desiccator A device for drying substances, *e g*, a glass vessel containing a deliquescent substance, such as, calcium chloride, sulfuric acid, etc **vacuum-.** A d which may be evacuated

desicchlora An anhydrous, granulated barium perchlorate, used as a regenerable drying agent and absorbent for ammonia

desmin $(Na_2,Ca)Al_2Si_6O_{16}\,6H_2O$ A sodium-calcium aluminum silicate, colorless crystalline masses, d 2 1, hardness 3 5–4

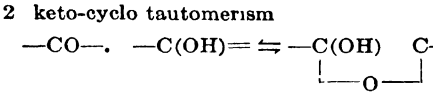
desmolases Enzymes whose activities result in the liberation of energy, as, reductases and oxidases

desmotrope One of a pair of tautomeric compounds The seven most important types are

1 keto-enol tautomerism

$$=CH\ CO- \leftrightarrows =C\ C(OH)-$$

2 keto-cyclo tautomerism

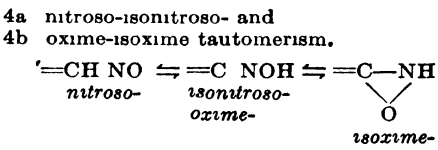


3 imino-amino tautomerism

$$=CH\ C(\ NH)- \leftrightarrows =C\ CNH_2-$$

4a nitroso-isonitroso- and

4b oxime-isoxime tautomerism.



5 nitro-isonitro tautomerism

$$\equiv CH\ NO_2 \leftrightarrows \equiv C\ N(\ O)OH$$

6 nitrosamine-isodiazo tautomerism

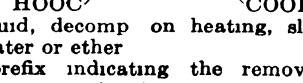
$$-NH\ N\ O \leftrightarrows -N\ N\ OH$$

7 azo-hydrazone tautomerism

$$=CH\ N\ N- \leftrightarrows =C\ N\ NH-$$

desmotropism Allelomorphism, dynamic allotropy A form of isomerism (tautomerism) of organic compounds which exists between two molecules containing the same number and kind of atoms of like valency, in the same position, but with different linkages, *e g*, shifting of the double bond and wandering of a hydrogen atom and enol and keto forms See *isomerism, tautomerism*

desorption (1) The reverse of adsorption, q v (2) The evolution or liberation of a gas or volatile material from its solution, the reverse process to absorption

desoxalic acid $C_5H_6O_8$ = 194 1 *1 2*-Dihydroxy-*1 1 2*-ethane tricarboxylic acid* The tribasic acid  A colorless liquid, decomp on heating, slightly soluble in water or ether

desoxy- A prefix indicating the removal of oxygen **d compound.** An organic compound in which the hydrogen group has been replaced by hydrogen It has been proposed to give such compounds the ending, -ane, thus, desoxyquinine becomes quinane, and desoxy-cinchonine becomes cinchonane **d. sugar** A group of carbohydrates occurring in nature in biologically important substances, which add H_2O and form a sugar, as, digitalose, fucose, rhamnose

desoxyalizarin Anthrarobin

desoxybenzoin $C_{14}H_{12}O$ = 196 1 Phenylbenzylketone, benzylphenylketone, α-phenyl-acetophenone Ph CH_2 CO Ph Colorless scales, m 60, b 314, slightly soluble in hot water, soluble in alcohol or ether

desoxycholic acid. $C_{24}H_{40}O_4$ = 392 32 An acid from bile Cf *cholane*

desoxycinchonine Cinchonane

desoxycodeine Codeinane

desoxydation The removal of oxygen from a molecule, or reduction

desoxymorphine Morphane

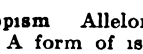
desoxyquinine Quinane

dessert-spoon. A measure equal to 2 fluid drams, or about 8 cc

destructive distillation The irregular decomposition of organic compounds by heating them out of contact with air, as, the production of wood tar or coal tar

desulfuration (1) The removal of sulfur from an organic substance, *e g*, by arsenic trioxide (2) The reduction of sulfur content, as, in steel manufacture (3) The precipitation of sulfides with lead or mercury cyanides in the cyanidization of gold ores

desulfurization Desulfuration

desyl The monovalent radical  , derived from desoxybenzoin

bi- See *bidesyl*

detaline Deltaline

detection The qualitative identification of an element or compound in a material Cf *determination* **d limit** The smallest quantity of a particular substance (in γ) which may be detected by a particular chemical reaction

detector Any device for detecting electric waves, as, a valve or radio tube

detergent (1) A cleansing agent (2) A drug which is used externally for cleansing wounds, etc Synonym abstergent

DETERGENTS

Type	*Name and definition*
R COOM	Soaps, the alkali salts of fatty acids
SO_2O R COOM	Turkey red oils, or sulfonated fatty acids
$(SO_2O)_x$R COOM	Monopole soap or highly sulfonated fatty acids
SO_2O R OH	Gardinols, or sulfonated fatty alcohols

determination (1) Quantitative analysis or a process for obtaining the amounts of the constituents in a material Cf *detection* (2) A method of ascertaining numerical data

determinism The principle that all properties of the atom may be related and determined Cf *indeterminancy, uncertainty*

detonation. An explosion or a violent sound produced by a chemical change, as, the rapid decomposition of high explosives, or the rapid

ignition of an explosive mixture in an internal combustion engine causing knocking

detonator Primer A fuse or compound which ignites an explosive mixture

detoxicate To make a poisonous substance harmless

deuterate A substance containing heavy water of crystallisation

deuteric acid An acid containing deuterium, as R COOD, R $COOH^b$, or R $COOH^2$ **aceto-** $CH^1_3COOH^2$ **benzo-** $C_6H^1_5COOH^2$ Cf *deuterobenzoprotic acid*

deuterium D_2 = 4 02712 Heavy hydrogen, deuteronium, diplogen The isotope of hydrogen of atomic weight 2 01356, H^2 or H^b **d oxide** D_2O = 20 03 Heavy water, H^2_2O or H^b_2O A colorless liquid, d 1 1056, m 3 8, b 101 42, n^D_{20} 1 3281, it inhibits the growth of seedlings and cells

deutero- A prefix meaning (1) second in order, (2) derived from, (3) containing heavy hydrogen (deuterium)

deuteroacetic acid $CH^2_3COOH^2$ or CD_3COOD

deuteroacetoprotic acid CH^2_3COOH' or CD_3COOH

deutero-albumose A derivative of albumoses A yellow powder, soluble in water

deuteroammonia. The compound ND_3 or NH^2_3 It differs from ammonia as follows

	NH_3	NH_2D	NHD_2	ND_3
%D	0	68	90	99
m	195 2°A	197 9°A	198 6°A	199°A
b	239 75°A	241 7°A mono-	242 1°A di-	242 3°A tri-

deuteroammonium The radical ND_4^+ There are *mono-*, *di-*, *tri-* and *tetra-* derivatives

deuteroartose $C_{156}H_{244}N_{40}O_{56}S$ A secondary artose

deuterobenzoic acid C_6D_6COOD or $C_6H^2_6$-$COOH^2$

deuterobenzoprotic acid C_6D_6COOH or $C_6H^2_6$-$COOH'$

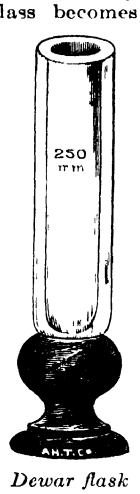
deuterochloroform Chloroform-*d*

deutero-fibrinose A product formed from fibrin during digestion

DEUTERIUM NOMENCLATURE

	Boughton names	Deuterio names
NH_2D	ammonia-*d*	deuterioammonia
NH_3	ammonia-d_3	trideuterioammonia
D_2SO_4	sulfuric acid-d_2	sulfuric dideuterioacid
$HDSO_4$	sulfuric acid-*d*	sulfuric deuterioacid or sulfuric monodeuterioacid
$Na_2SO_4\ 5D_2O$	sodium sulfate pentahydrate-d_{10} or pentahydrate-d_2)	sodium sulfate pentadideuteriohydrate
NH_2D_2OD	ammonium-d_2 hydroxide-*d*	dideuterioammonium deuterioxide
NHDOD	hydroxylamine-α,β-d_2 or hydroxyl-*d*-amine-*d*	α,β-dideuteriohydroxylamine or deuterioxyldeuterioamine
CH_3D	methane-*d*	deuteriomethane
CD_4	methane-d_4	tetradeuteriomethane
$CDCl_3$	chloroform-*d*	deuteriochloroform
$CH_2DC(CH_3)_2CH_3$	2,2-dimethylpropane-1-*d* or neopentane-*d*	1-deuterio-2,2-dimethylpropane or deuterioneopentane
CH_3CDO	acetaldehyde-*d*	acetodeuterialdehyde
CD_3CDO	acet-d_3-aldehyde-*d*	trideuterioaceto deuterioaldehyde
CH_3CH_2OD	ethyl alcohol-*d*	*O*-deuterioethyl alcohol or ethyl deuterioalcohol
CH_3CH_2COOD	propionic acid-*d*	propionic deuterioacid
CH_2DCH_2COOD	propionic-β-*d* acid-*d*	β-deuteriopropionic deuterioacid
$CH_2DCONHD$	acetamide-*N*,α-d_2 or acet-*d*-amide-*d*	*N*,α-dideuterioacetamide
C_6D_6	benzene-d_6	hexadeuteriobenzene
2,3-$D_2C_6H_3Cl$	chlorobenzene-2,3-d_2	1-chloro-2,3-dideuteriobenzene
3-$DC_6H_4CH_2D$	toluene-α,3-d_2	α,3-dideuteriotoluene
C_6H_5OD	phenol-*d*	*O*-deuteriophenol or benzenedeuteriol
4-DC_6H_4OD	phen-4-*d*-ol-*d*	*O*,4-dideuteriophenol
C_6H_5COOD	benzoic acid-*d*	benzoic deuterioacid
2,4-$D_2C_6H_3COOH$	benzoic-2,4-d_2 acid	2,4-dideuteriobenzoic acid
DHNC CD CH CH CH CH	aniline-*N*,2-d_2	*N*,2-dideuterioaniline
HOOCC C(COOD) CH CD CH CH	phthalic-4-*d* acid-2-*d*	4-deuteriophthalic 2-deuterioacid

deutero-globulose A product formed from globulin during digestion
deutero-proteose Deutero-albumose
deuteron Deuton, diplon A deuterium nucleus or a particle of mass 2 0 with one positive charge Cf *proton*
deuteronium Deuterium
deuteroxyl The OD^- or OH^{2-} ion
deuton A deuteron
Devarda's alloy An alloy of 50 % Cu, 45 % Al, and 5 % Zn It is a strong reducing agent in alkaline solution
developed dyes Colors produced from colorless substances by chemical reactions
developer A reducing liquid used in photography for rendering the image on an exposed plate visible, usually by the formation of black metallic silver
development (1) In biology the growth and differentiation in the structure of an organism, and the acquirement of new, favorable characteristics (2) In photography rendering visible the image on an exposed plate, paper, or film, usually by reduction of light sensitive gold or silver salts to the metallic state
deviation The bending or turning of a direction or course
devil's apple Stramonium
devitrifaction The removal of transparency owing to crystallization, *e g*, glass becomes opaque with age or under the influence of certain chemicals
devitrification Devitrifaction
dew Moisture precipitated on a surface from an atmosphere saturated with water-vapor **d point** The temperature of the atmosphere at which dew begins to form, it is an indication of the humidity of the air (q v)
Dewar, Sir James 1842–1923 An English chemist, noted for the liquefaction of gases and experiments at low temperature **D flask** Vacuum flask A double-walled, glass vessel silvered or unsilvered, of varied shape and evacuated between the two walls, used for experiments with liquids at very low temperatures, or as container for liquefied gases



Dewar flask

deweylite $Mg_4Si_3O_{10}\,6H_2O$ An amorphous white, magnesium silicate related to talc
dextran $(C_6H_{10}O_5)_x$ = (162 1)$_x$ A gummy, fermentable carbohydrate produced by certain cocci from molasses, beet-juice, milk or wine, it causes ropiness
dextrase An enzyme changing dextrose to lactic acid
dextrin $(C_6H_{10}O_5)_x$ British gum, starch gum, amylin, gommelin, gummeline A carbohydrate produced from starch by hydrolysis by dilute acids, diastase, ferments, or dry heat It is an intermediate product between starch and the sugars into which starch hydrolyzes An amorphous, odorless, white or yellowish powder, soluble in water or dilute alcohol and precipitated by strong alcohol It does not give the blue iodine reaction of starch and is not fermentable, but changes to maltose by the action of enzymes (diastase), and to dextrose by action of acids Used as a substitute adhesive for gum arabic, in calico printing, in the manufacture of inks, stains, water-colors and many other articles **achroo-** See *achroo*-dextrin **amylo-** See under *amylo*-dextrin **animal-** Glycogen **erythro-** See *erythro*-dextrin
dextrinose Gentiobiose
dextro- *d-* A prefix meaning toward the right, *e g* , dextro-rotatory Cf *levo-*
dextrocarvol Carvone
dextro-compound. A dextrorotatory compound, *i e* , an optically active compound which turns the plane of polarized light to the right, that is clockwise
dextrogyric Dextrorotatory
dextronic acid Gluconic acid
dextrorotary Dextrorotatory
dextrorotatory Turning to the right, or clockwise **d compound** A substance whose solution turns the plane of polarized light to the right, *i e* , clockwise See *optical activity, asymmetric carbon atom, stereoisomerism*
dextrosans Glucosans
dextrosazone Glucosazone
dextrose Glucose
deyamittin $C_{18}H_{12}O_3N$ A glucoside from *Cissampelos pareira,* colorless crystals Cf *dyamettin, cissampeline*
dg An abbreviation for decigram one-tenth of a gram, or 100 mg
dhurrin $C_{14}H_{17}NO_7$ = 311 14 A glucoside from millet and sorghum, which hydrolyzes to glucose, HCN and *p*-hydroxybenzaldehyde Colorless needles, m 196
Di The symbol for didymium, a mixture of neodymium and praseodymium
di- A prefix meaning two, or twice Cf *bi-*
dia- A prefix meaning through, or opposite
diabantite A hydrous magnesium-iron aluminum silicate of the chlorite group, $H_{18}(Mg, Fe)_{12}Al_4Si_9O_4$
diabase An igneous rock formed in the transition from basalt to granitoid gabbros and consisting of plagioclase, magnetite, augite, and sometimes olivine
diabetin Fructose
diacetamide $C_4H_7O_2N$ = 101 11 Diacetylamine, *N*-acetylacetamide, Me CO NH C O Me Colorless needles, m 78, b 223, soluble in water or ether **phenyl-** Diacetanilide
diacetanilide $C_{10}H_{11}O_2N$ = 177 15 Diacetylaniline, *N*-acetylacetanilide, *N*-phenyldiacetamide, acetoacetanilid Me CO NPh CO Me Colorless leaflets, m 37 5, b $_{11mm}$142, soluble in water or alcohol
diacetate (1) A salt of diacetic acid (2) A salt containing two acetoxy groups, $CH_3COO—$
diacetenyl The radical —C C—C C—, as in d benzene **d benzene** Diphenyl diacetylene
diacetic acid (1) $C_6H_8O_4$ = 144 1 Diacetylacetic acid $(MeCO)_2CH\,COOH$ A colorless liquid, sometimes a constituent of diabetic urine (2) Acetoacetic acid (3) Succinic acid **acetone-** Hydrochelidonic acid **ethidene-** β-Methyl glutaric acid **phenylene-** Phenylene diacetic acid **propidene-** β-Ethyl glutaric acid **d ester** $C_8H_{12}O_4$ = 172 1 Ethyldiacetate, ethyl diacetylacetate, ethyl diacetic ester $(MeCO)_2CHCOOEt$ A colorless liquid, d 1 101, decomp 200, slightly soluble in water
diacetin $C_7H_{12}O_5$ = 176 14 Glyceryl diacetate, $(MeCOOCH_2)_2CHOH$ A colorless liquid, d 1 179, m 40, b 259, soluble in water, alcohol, or ether
diacetonamine $C_6H_{13}ON$ = 115 08 β-Amino-isopropyl acetone A product formed by

the action of ammonia on acetone or mesitone A light liquid of characteristic odor Cf *acetonamine*

diacetone Acetylacetone **d alcohol** $C_6H_{12}O_2$ = 116 1 The ketone alcohol $MeCOCH_2CMe_2OH$ A colorless liquid, b 164, used as a solvent for nitrocellulose and resins

diacetyl (1) Biacetyl (2) A prefix indicating the presence of two acetyl radicals **methyl-** See *methyldiacetyl*

d amide Diacetamide **d anilide** Diacetanilide **d glucose** $C_{10}H_{16}O_8$ = 264 2 Colorless crystals, m exceeds 100, soluble in water, alcohol or ether **d morphine** Heroine **d peroxide** $C_4H_6O_4$ = 118 08 MeCO O-O COMe A yellowish liquid, used in solution as an antiseptic **d tannin** Tannigen **d urea** $C_5H_8O_3N_2$ = 144 2 MeCO NH CO-NH COMe Colorless crystals, soluble in water

diacetylene C_4H_2 = 50 0 Butadiine, diacetylene A colorless, gaseous hydrocarbon, HC-C C CH **d glycol** $C_6H_6O_2$ = 110 1 Hexadiin-diol $CH_2OH\,C\,C\,C\,C\,CH_2OH$ Colorless crystals, m 111

diacetylenes A group of unsaturated hydrocarbons containing two triple bonds, of the general type, C_nH_{2n-6}

diacetylene, butadiine, butadiyne*	C_4H_2
pentadiine, pentadiyne*	C_5H_4
dipropargyl, hexadiine, hexadiyne*	C_6H_6

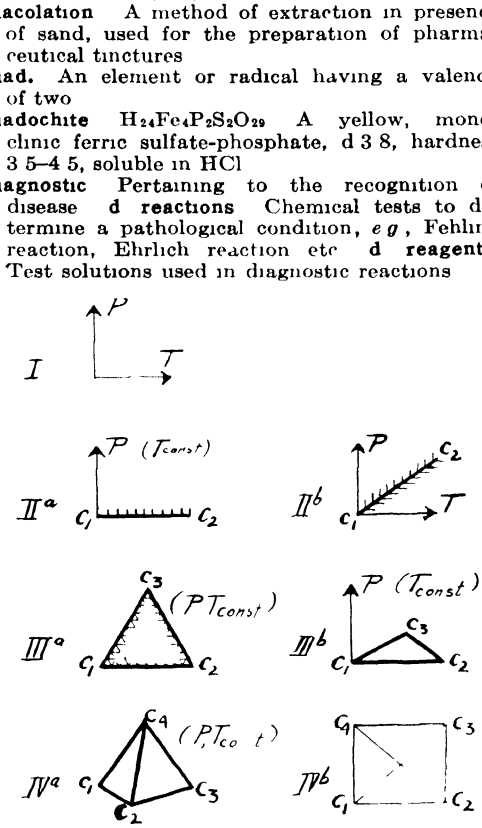
diacid A compound which contains two hydroxyl groups, as $Ca(OH)_2$

diacolation A method of extraction in presence of sand, used for the preparation of pharmaceutical tinctures

diad. An element or radical having a valency of two

diadochite $H_{24}Fe_4P_2S_2O_{29}$ A yellow, monoclinic ferric sulfate-phosphate, d 3 8, hardness 3 5–4 5, soluble in HCl

diagnostic Pertaining to the recognition of disease **d reactions** Chemical tests to determine a pathological condition, *e g*, Fehling reaction, Ehrlich reaction etc **d reagents** Test solutions used in diagnostic reactions **d test** A biochemical experiment for detecting pathological conditions, *e g*, Wassermann test, Noguchi test, Widal test

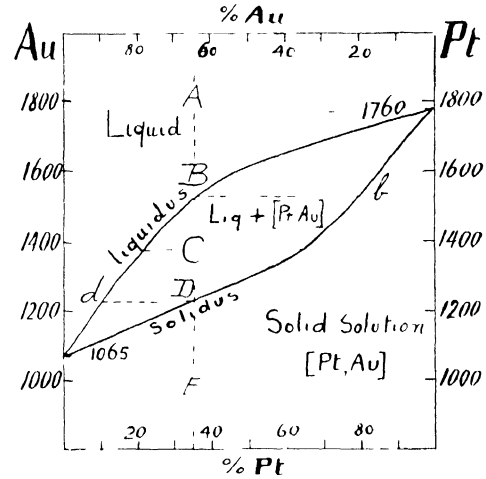


Types of Diagrams

diagram Phase rule plot A graph showing the relation of one or more properties of one or more substances Cf *coordinates* The types and forms of d are shown in the preceding column

I One-component system The relation of two quantities or properties of one substance, such as T and P

II Two component system *a* The relation of one quantity in a binary mixture is shown by plotting this quantity against concentration, c_1



Two Component System (Gold-Platinum)

Temperature (vertical lines) is plotted against concentration or percentage composition Any vertical line, as AB, is concentration vertical, any horizontal line, as Bb, is temperature horizontal Curve dB is the liquidus, curve Db the solidus Assume an alloy of 65 % gold and 35 % platinum molten at a temperature of 1800°C This homogeneous liquid mixture, A, is allowed to cool Solidification begins at B or 1525°C , but the solid which separates has composition b, that is 20 % gold and 80 % platinum, hence proportionately more platinum freezes as gold, the liquid portion becomes richer in gold, corresponding with the liquidus B to d At C, 1380°C , the temperature horizontal indicates that the liquid consists of 80 % gold and 20 % platinum, while the solid alloy which has crystallized has the composition of 35 % and 65 % platinum Cooling still further, until D, 1220°C is reached, the entire mass has crystallized, the last portion to crystallize, d, consisting of 90 % gold and 10 % platinum Hence while the total composition of the alloy at E is like that at A, it is now a heterogeneous mixture of larger or smaller crystals of composition varying from b to d

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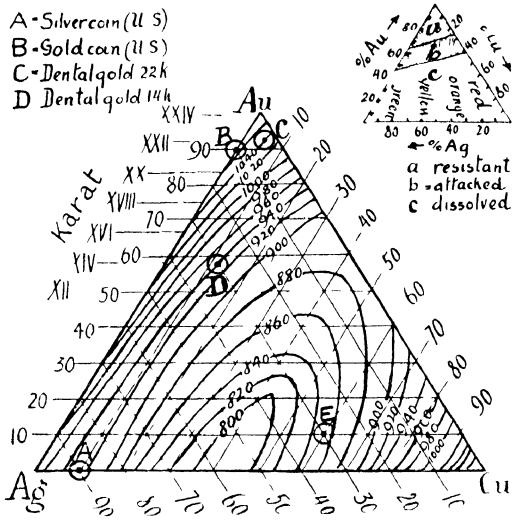
and c_2 *b* The relation of two quantities in a binary mixture is shown by a three dimensional model See figure

III Three component system *a* The relation of one quantity in a ternary system is shown by a curve in a triangle *b* Two properties can be shown by a three dimensional model See figure

IV Four component system Requires a model to adequately represent it, for even a three-dimensional model may not properly show the relation of one quantity



Three component system (Gold-Silver-Copper)

The percentage of gold is shown by the horizontal lines, 100 % Au being at the apex of the triangle The percentage of silver is indicated by the lines sloping upwards toward the left, copper the lines sloping upwards toward the right, Thus, point

A = 10 % silver, 90 % copper, no gold
B = 90 % gold, 10 % silver, no copper
C = 92 % Au, 5 % Ag, 3 % Cu
D = 58 % Au, 30 % Ag, 12 % Cu
E = 10 % Au, 30 % Ag, 60 % Cu

In the smaller diagram are shown the colors of the alloys and the action of acids on them

The curves indicate the melting points of these alloys, thus

A at 925°C
B at 1060°C
C at 1040°C
D at 940°C
E at 850°C

diakon Trade name for a methyl methacrylate plastic

dial (1) A dialdehyde (2) Diallyl barbituric acid **d uramide** Uramil

dialdehyde Dial A compound containing two aldehyde groups, as, *methane dial* or malonic aldehyde, *ethane dial* or succinic aldehyde

dialin $C_{10}H_{10}$ = 130 08 Dihydronaphthalene **1 2-** Colorless liquid, d 0 996, m −9, b 84 5 **1 4-** Colorless liquid, d 0 998, m 15, b 212

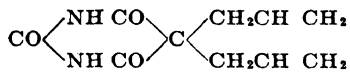
dialkene Diolefine

dialkyl An organic compound containing two alkyl radicals

dialkylene An organic compound containing two alkylene radicals

diallag (Mg,Fe)$CaSi_2O_6$ A magnesium-iron calcium silicate, sometimes containing alumina, d 3 2, hardness 4

diallyl (1) C_6H_{10} = 82 1 $\Delta^{1,5}$-hexadiene* (q v), $CH_2{=}CH{-}CH_2{-}CH_2{-}CH{=}CH_2$ A colorless liquid, $d_{17°}$ 0 687, b 59 5, insoluble in water (2) An organic compound containing two allyl radicals **d amine** $C_6H_{11}N$ = 97 09 Di-*2*-propenylamine*, $(CH_2{=}CH{-}CH_2)_2NH$ A colorless liquid, b 111 **d barbituric acid** $C_{10}H_{12}O_3N_2$ = 208 2 Dial



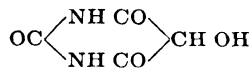
Colorless, shining scales, m 170, slightly soluble in water, soluble in alcohol or ether, used medicinally as a hypnotic and sedative **d sulfide** Allyl sulfide **d urea** Sinapolin

dialozite $MnCO_3$ A native manganous carbonate

dialuramide Uramil

dialurate A salt of dialuric acid

dialuric acid $C_4H_4O_4N_2$ = 144 1 Tartronylurea, 5-hydroxybarbituric acid



A monobasic heterocyclic acid derived from alloxan Colorless prisms, slightly soluble in water

dialysate Dialyzate

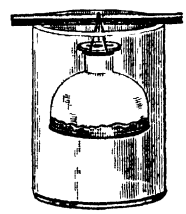
dialysed Separated by dialysis **d iron** A colloidal solution of ferric hydroxide

dialysis Ultrafiltration Micro-filtration by means of a semi-permeable membrane, which separates crystalloids (molecules) from colloids (particles of ultramicroscopic size)

dialyzate The crystalloid filtrate, which has dialysed through a membrane Cf *diffusate*

dialyzator An apparatus for separating colloids from non colloids (dialysis)

dialyzer The semi-permeable membrane used in dialysis, *e g*, parchment, collodion, or a porous cup treated with certain chemicals Cf *diffusion shell*



Dialyzator

diamagnetic Repelled by a magnet, or taking a position at right angles to the field of an electromagnet Such substances have magnetic permeabilities less than unity Cf *paramagnetic*

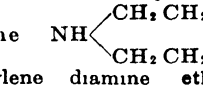
diameter (1) A straight line passing through the center of a body or figure Cf *circle, caliber* (2) A measure of magnification, the number of times the d of the object is increased

diamide (1) Oxamide (2) A compound containing two $-CONH_2$ groups

diamidine (1) Oxalamidine, (2) A compound containing two amidine groups

diamido- A prefix indicating the presence of two amido radicals **d cyanidine** Formoguanine

diamidogen Hydrazine

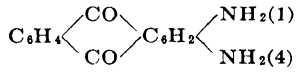
diamine (1) Hydrazine (2) See *diamines* **amylene-** $C_5H_{14}N_2$ = 102 2 Pentamethylenediamine, cadaverine, 1 5-diaminopentane **butylene-** $C_4H_{12}N_2$ = 88 2 Tetramethylenediamine, putrescine, 1 4-diaminobutane **diethylene-** $C_4H_{10}N_2$ = 86 2 Cyclic tetramethylene diamine  **dimethylene-** Ethylene diamine **ethylene-** $C_2H_8N_2$ = 60 1 Dimethylenediamine $NH_2{-}CH_2CH_2NH_2$ A colorless liquid, m 8 5, b 116 5 **hexamethylene-** $C_6H_{16}N_2$ = 116 2 Triethylenediamine $NH_2(CH_2)_6NH_2$ **pentamethylene-** Amylene diamine **phenylene-** C_6-

H_7N_2 = 107 1 **ortho-** 1 2-Diaminobenzene **meta-** 1 3-Diaminobenzene **para-** 1 4-Diamino*benzene* **propylene-** $C_3H_{10}N_2$ = 74 2 Trimethylenediamine, $NH_2(CH_2)_3NH_2$ A colorless liquid, b 119 **tetramethylene-** Butylene diamine (cyclic-) Piperazine **triethylene-** Cyclic hexamethylene diamine **trimethylene-** Propan diamine

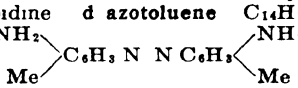
d blue Trypan blue

diamines A group of compounds containing two —NH_2 groups **aliphatic-** Compounds containing two amino groups attached to a carbon chain, *e g* , ethylene diamine **aromatic-** Compounds containing two amino groups attached to a carbon ring, *e g* , the diamino benzenes (phenylene diamines) **heterocyclic-** Saturated ring compounds in which the amino group takes part in ring formation, *e g* , diethylene diamine, triethylene diamine **homocyclic-** Aromatic diamines

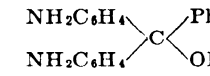
diamino- A prefix indicating the presence of two amino groups (—NH_2) **d anthraquinone** $C_{14}H_{10}O_2N_2$ = 238 2 (**alpha-**) or 1 4-



Red needles, m 236, slightly soluble in alcohol or water, soluble in benzene (**beta-**) or 2 3- Brownish-red needles, sublime on heating, soluble in water, alcohol or chloroform (**ortho-**) or 1 2- Blue crystals, decomp 130, insoluble in water, soluble in alcohol **d azobenzene** Azobenzene **d azobenzene hydrochloride** Chrysoidine **d azotoluene** $C_{14}H_{16}N_4$ = 240 -16



Isomers include 2 2′-diamino-4 4′-azotoluene, m 203, 3 3′-diamino-2 2′-azotoluene, m 145 **d benzene** See *benzene* **d benzoic acid** See *benzoic acid* **d benzophenone** $C_{13}H_{12}ON_2$ = 212 2 **alpha-**, para- or 4 4′-$NH_2C_6H_4CO C_6H_4NH_2$ Colorless needles, m 172, soluble in water, alcohol, or ether **beta-**, meta- or 3 3′- Yellow needles, m 237, soluble in water, alcohol or ether **d diphenic acid** $C_{14}H_{12}O_4N_2$ = 272 2 Benzidine dicarboxylic acid Colorless crystals, insoluble in water, soluble in alcohol, used in synthesis of dyes **d diphenyl** Benzidine **d diphenylamine** $C_{12}H_{13}N_3$ = 199 3 $NH_2C_6H_4NH C_6H_4NH_2$ Colorless scales m - 158, insoluble in water, soluble in alcohol or ether, used in organic synthesis **d diphenylethylene** Diaminostilbene **d diphenylmethane** $C_{13}H_{14}N_2$ = 184 19 para- or 4 4′- Colorless scales, m 87, soluble in water or alcohol, used in organic synthesis **d naphthalene** Naphthylene diamine **d naphthalene sulfonic acid** $C_{10}H_4(NH_2)_2(SO_3H)$ = 318 24 **1 5 3 7-** Colorless crystals, insoluble in water, soluble in alcohol or ether Used in organic synthesis **1 8 3 6-** Long, thin colorless prisms, soluble in water or alcohol Used in making H-acid **d naphthalene sulfonic acid** $C_{10}H_5(NH_2)_2SO_3H$ = 238 17 **1 - 4 2-** Small colorless crystals, slightly soluble in water, soluble in alcohol or ether, used in organic synthesis **1 3 6-** Colorless crystals, slightly soluble in water, soluble in alcohol or ether, used in organic synthesis **d phenol** See *phenol* **d phenol hydrochloride** Amidol **d stilbene** $C_{14}H_{14}N_2$ = 210 2 Diamino diphenyl ethylene, $NH_2C_6H_4CH CH C_6H_4NH_2$ Colorless scales, m 170, slightly soluble in water or ether, soluble in alcohol **d stilbene disulfonic acid** $C_{14}H_{12}N_2(SO_3)_2$ = 370 23 **1 2 4-** or *α-* A yellow crystalline powder, insoluble in water, soluble in alcohol or ether, used in organic synthesis **d triphenyl carbinol** $C_{19}H_{14}ON_2$ = 286 2 An intermediate used in the dye industry



d triphenylmethane $C_{19}H_{18}N_2$ = 274 26 **para-**, or **4 4′-** Colorless crystalline beads, m 139, slightly soluble in water, alcohol or ether, an intermediate in the synthesis of dyes

diamino-phosphatides A group of fatty substances containing two nitrogen atoms to one phosphorus atom, *e g* , aminomyeline, sphingomyeline etc **diamino-diphosphatides** Phosphatides containing two nitrogen atoms and two phosphorus atoms, *e g* , assurin **diamino-monophosphatides** Diamino-phosphatides

diammonium (1) N_2H_8 = 36 08 NH_4NH_4 Cf *hydrazinium* (2) A prefix indicating the presence of two ammonium radicals, as, d phosphate, $(NH_4)_2HPO_4$ **mercur-** See *mercurdiammonium*

diamond C = 12 001 A crystallized carbon, which occurs in colorless or variously tinted isomeric crystals, d 3 53, hardness 10, insoluble and non-fusible, but burning to carbon dioxide at high temperature Used as a precious stone, for cutting glass and as bearings for delicate mechanism, watches, etc **industrial-** D occurs in three varieties 1 *Carbons, carbonado, black Brazilian,* d in porous clusters of microscopic crystals, fine to close-grained 2 *Ballas,* nonporous, mostly round, consisting of innumerable minute *d* crystals 3 *Boarts, borts* Translucent crystals which cleave in layers

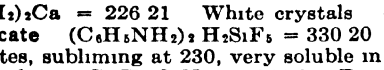
d black A black azo-dye, used for wool $C_6H_3(OH)(COONa) N N C_{10}H_6N N C_{10}H_5(OH)SO_3Na$ **d dust** (1) The finely powdered diamonds collected as waste material in diamond cutting and polishing (2) Finely-powdered glass, used as a polishing powder or for filtering acids **d flavin** $C_{19}H_{14}O_4N_2$ A yellow azo-dye, $C_6H_4(OH) C_6H_3N N C_6H_3(OH)COOH$ **d mortar** A small mortar made of hardest steel

diamyl (1) Decane (2) A compound containing two amyl radicals **d amine** $C_{10}H_{23}N$ = 157 3 A colorless liquid, d 0 7775, b 187, soluble in alcohol, ether, or chloroform Used in organic synthesis **d ketone** 6-Hendecanone* **d sulfide** $(C_5H_{11})_2S$ = 174 3 A colorless liquid, used as an odorant for natural gas and in organic synthesis Cf *amylmercaptan* **d phthalate** See *phthalate*

diamylene (1) Decene (2) A compound containing two amylene radicals (3) Terpene

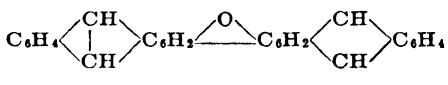
dianiline A prefix indicating the presence of two aniline molecules **d calcium** $(C_6H_5NH_2)_2Ca$ = 226 21 White crystals **d fluosilicate** $(C_6H_5NH_2)_2H_2SiF_6$ = 330 20 White plates, subliming at 230, very soluble in water

dianisidine $C_{14}H_{16}O_2N_2$ = 244 2 Dimethoxybenzidine, bianisidine



Colorless needles, m 170, slightly soluble in water or ether

dianthrafurane $C_{28}H_{16}O$ = 368 1 The heterocyclic compound,



dianthryl Bianthryl

diaphanometer An instrument for measuring transparency, as, of the atmosphere, solutions, paper Cf *nephelometer*

diaphanoscope (1) A darkened box containing a source of light for viewing transparent or semitransparent objects (2) An instrument for illuminating body cavities

diaphoretic A drug which stimulates the secretions from sweat glands and causes perspiration, *e g* , pilocarpine Cf *sudorific*

diaphorite $(Ag_2Pb)_6Sb_4S_{11}$ A metallic, orthorhombic lead-silver sulfoantimonite

diaphragm (1) A disk, with one or more holes, or with one hole of variable size, used to regulate the amount of light passing through a lens, *e g* , in a microscope, photographic apparatus etc (2) The porous container of a galvanic cell separating the two liquids (3) Any semipermeable partition or wall

diaphtherin $(C_9H_6N\,OH)_2C_4H_4(OH)HSO_3$ = 440 25 Oxychinaseptol A yellow crystalline powder, m 85, soluble in water or dilute alcohol, used as a non-poisonous antiseptic

diaphthol $C_9H_5N(OH)SO_3H$ = 225 14 Quinaseptol, o-oxyquinoline-m-sulfonic acid Yellowish crystals, m 295, slightly soluble in water, used as an antiferment and non-poisonous antiseptic Cf *oxychinaseptol*

diarabinose $C_{10}H_{18}O_9$ = 282 14 A disaccharide of arabinose, m 260

diarsenate A salt containing two arsenate radicals

diarsenide A compound containing two arsenic atoms

diarsenite A salt containing two arsenite radicals

diarsenol A Canadian brand of arsphenamine

diarsenous acid Pyroarsenic acid

diarsine Biarsine

diarsonium Cacodyl

diarsyl Biarsine

diascope A small portable x-ray tube and equipment, used for visual diagnosis (*e g* of teeth) by insertion into body-cavities

diaspore $Al_2O_3\,H_2O$ A hydrous aluminum oxide formed as a decomposition product of rocks

diastase (1) Vegetable amylase (2) Amylase An enzyme from malt, converting starch by hydrolysis into maltose, dextrin and maltodextrins, a change which, within limits, is favored by H^+ and restrained by OH^- A yellowish white or gray powder, soluble in water Its properties are destroyed at about 75°C Cf *ptyalase*

diastasic action The conversion of starch into water soluble substances (dextrin, maltose etc) by diastase

diastasimetry Measuring or determining the diastatic power of starch-digesting extracts

diastatic action Diastasic action

diathermy The slow penetration of heat

diathesin $C_7H_8O_2$ = 124 1 Salicyl-alcohol, o-oxybenzylalcohol Colorless crystals, m 86, soluble in water Used for rheumatism

diatol Diethylcarbonate

diatom A unicellular alga which has usually two symmetric halves **d ooze** Oceanic sediments, about 1500 fathoms deep, consisting of empty shells of diatoms and containing about 23 % calcium

diatomaceous earth Kieselguhr

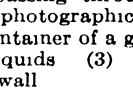
diatomic (1) A molecule of two atoms, *e g* , a binary compound (2) A substance containing two replaceable hydrogen atoms **d alcohol** A glycol or organic compound having two hydroxyl groups **d acid** An acid containing two replaceable hydrogen atoms **d bases** A base containing two active hydroxyl groups

diatomite Kieselguhr

diazacyclo- A prefix indicating the presence of 2 NH groups in a large ring, as, **d dotriacontamine** $NH(CH_2)_{15}NH(CH_2)_{15}$ **d octacosamine** $NH(CH_2)_{13}NH(CH_2)_{13}$

diazene Diazete

diaezte $C_2H_4N_2$ = 56 0 Diazene The heterocyclic system



diazines (1) A group of hydrocarbons, consisting of a hexatomic ring with two nitrogen atoms and four carbon atoms

1 2- or ortho-	pyridazine
1 3- or meta-	pyrimidine
1 4- or para-	pyrazine

(2) A suffix indicating a ring compound with two nitrogen atoms, as, benzo d , dibenzo para d , naphtho d , etc

diazo- A prefix indicating the presence of the bivalent —N N— radical The isomer > N N is diazonium **d compounds** A group of very reactive organic nitrogen compounds which are formed when nitrous acid acts at low temperatures on the salts of primary aromatic amines They are usually explosive, and are therefore not isolated in their crystalline form, but used in solution as intermediates in the manufacture of important dyestuffs Cf *disazo compounds* **d test** A reaction shown by pathological urine, which turns red on the addition of diazobenzene sulfonic acid

diazoacetate A salt of diazoacetic acid **ethyl-** $C_4H_6O_2N_2$ = 114 07 A colorless liquid, d 1 073, m −24, b_{120mm} 143

diazoacetic acid $C_2H_2O_2N_2$ = 86 14 The monobasic acid N_2 CH COOH

diazoamino Azimino The bivalent radical —N N NH— **d benzene** $C_{12}H_{11}N_3$ = 197 - 27 *1 3*-Diphenyltriazene* The compound Ph N N NH Ph Yellow leaflets, m 98, decomp on further heating, insoluble in water, soluble in alcohol or ether **d naphthalene** $C_{20}H_{15}N_3$ = 297 3 *1 3*-Di-*1*-naphthyltriazine* Yellow leaflets, explode on heating, insoluble in water

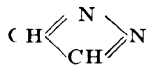
diazoate A salt of the type Ar N NO OM, derived from diazoic acid Cf *diazotate*

diazobenzene See *benzene* **d acid** Nitranilide **d chloride** $C_6H_5N_2Cl$ = 140 60 Benzene diazonium chloride* Colorless needles, decomp on heating, soluble in water or alcohol **d cyanide** $C_7H_5N_3$ = 158 21 Yellow prisms, m 69, slightly soluble in water **d hydroxide** Diazonium hydroxide **d imide** $C_6H_5N_3$ = 119 20 A yellow, oily liquid,

d 1 098, explodes when heated, insoluble in water, sparingly miscible with alcohol or ether **d nitrate** $C_6H_5O_9N_3$ = 167 19 Colorless needles which explode on heating, soluble in water or alcohol **d sulfonic acid** $C_6H_4O_8N_2S$ = 184 18 Benzene azo sulfuric acid Small, red prisms, decomp on heating, insoluble in water It is a reagent for pathological urine

diazodinitrophenol $C_6H_2N_4O_5$ = 210 1 DDNP, *4 6*-dinitrobenzene-*2*-diazo-*1*-oxide Bright yellow needles, true d 1 63, apparent d 0 27–0 86, used as detonating compound for percussion caps

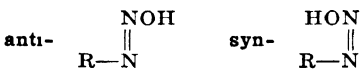
diazoethane $C_2H_2N_2$ = 54 0 Azıethylene, azıethane The heterocyclic compound



dimethyl- $C_4H_6N_2$ = 82 0 Colorless crystals, m 270

diazohydrates A group of compounds containing the bivalent —N NO— group, *e g*, diazobenzenemethylether Ph—N NO—Me

diazohydroxide The monovalent —N NOH radical, which occurs in two isomeric forms, as,

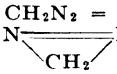


diazoic acid An isomer Ph N NO OH, of phenyl nitramine (PhNH NO_2), from which diazoates are derived

diazoimide Hydrazoic acid

diazoimido compounds Compounds containing the monovalent —N_3 radical, , derived from diazoimide **d phenyl** Diazobenzeneimide

diazoles A group of pentacyclic hydrocarbons with two nitrogen atoms **1 2-** Pyrazole **1 3-** Imidazole **iso-** See *isodiazole* **ox-** See *oxdiazole* **thio-** See *thiodiazole*

diazomethane CH_2N_2 = 42 04 Azimethylene, azimethane  A poisonous, yellow, odorless gas, used for methylation in organic synthesis

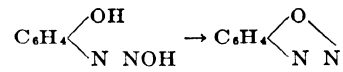
diazonium The bivalent radical = N N, which contains a pentavalent and a trivalent nitrogen atom **d compounds** A group of aromatic nitrogen compounds containing the diazonium group, ArN(N)— **d hydroxide** The very unstable base PhN NOH which in solution is ionized into 90 % $PhNN^+$ and OH^- and readily forms salts of the type PhNNX Cf *tyrotoxin* **d ion** The basic $PhNN^+$ radical **d salts** A group of compounds of the general type , in which X is an acid radical, as

diazobenzenechloride	PhNNCl
diazobenzenenitrate	$PhNNNO_3$
diazobenzenesulfate	$(PhNN)_2SO_4$
diazobenzenesulfocyanide	PhNN—SCN

diazo-oxyamido The bivalent —N N N(OH)— radical **d benzene** $C_{12}H_{11}ON_3$ = 213 1 Colorless crystals, m 127

diazoparaffins Aliphatic hydrocarbons containing the diazo group, as diazomethane

diazophenol (1) $C_6H_4ON_2$ = 120 1 p-Diazophenol, furo-(a,-b)-diazole A colorless crystalline substance, explodes at 38 (2) A group of internal diazo oxides formed from true diazophenols by dehydration

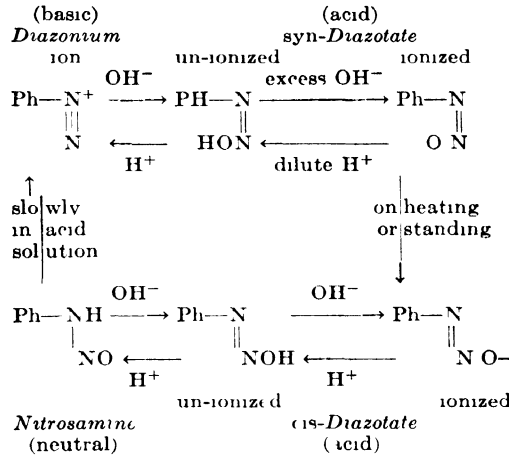


diazosalt A compound of the type Ar N N X, where Ar is an aromatic radical and X an acid radical or a halogen

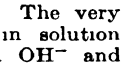
diazosplit The decomposition of a diazosalt and the formation of an aryl compound *e g*, ArNNX = ArX + N_2 where X is an acid or halogen radical Cf *Sandmeyer's reaction*

diazosulfide Benzothiodiazole

diazotate A metal salt and tautomer of diazonium hydroxide, it is acid in character and contains the ArN NO— radical Cf *diazoate* Isomeric forms *cis-* (*syn-* or normal) and *trans-* (anti- or iso-), either may occur ionized or un-ionized in solution, and may form salts of the type ArNNOM, where M is a monovalent metal The chemical relations



d ion The acid $PhNNO^-$ ion, exists in two isomeric forms **d split** The decomposition of a diazotate to a phenol and nitrogen ArNNOH = ArOH + N_2

diazotetrazole CN_6 = 96 06 The heterocyclic compound  , which occurs as colorless, explosive crystals

diazotization A process by which a diazo compound is prepared, *e g*, the treatment of amines with nitrous acid

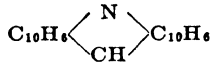
diazotizing A method, discovered by Griess in 1860, extensively used in the manufacture of aniline dyes Primary amines are treated with nitric oxides or compounds which release such oxides, *e g*, nitrites or nitrous acid

diazoxy The bivalent radical —N(O)=N—

diazthines Thiodiazines

dibasic (1) Describing compounds which contain two hydrogen atoms replaceable by a monovalent metal, or an acid which furnishes two hydrogen ions, as H_2SO_4 (2) Diatomic, dihydric An alcohol containing two hydroxyl groups, as, ethylene glycol

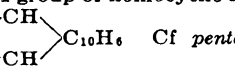
dibenzacridine $C_{21}H_{13}N$ = 279 1 Naphthacridine The heterocyclic compounds



Six possibilities $\alpha\alpha'$-, $\alpha\beta'$-, $\alpha\gamma'$-, $\beta\beta'$-, $\beta\gamma'$- and $\gamma\gamma'$-

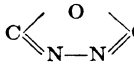
dibenzamide (1) $C_{14}H_{11}NO_2$ = 225 09 Benzoyl benzamide, dibenzoyl amine $(PhCO)_2NH$ Colorless crystals, m 148 (2) A compound which contains two monovalent —NH CO Ph radicals **ethidine-** $C_{16}H_{16}O_2N_2$ = 268 2 $(PhCONH)_2CHMe$ Colorless crystals, m 204 **ethylene-** $C_{15}H_{16}O_2N_2$ = 268 2 $(PhCONH\text{-}CH_2)_2$ Colorless crystals, m 249 **methylene-** $C_{15}H_{14}O_2N_2$ = 254 2 Colorless crystals, m 221

dibenzanthracene $C_{22}H_{14}$ = 278 1 Naphthophenanthrene, dinaphthanthracene, benzonaphthacene A group of homocyclic hydrocarbons,

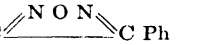


as, $C_{10}H_6$ Cf *pentacene*

dibenzenyl (1) Tolane (2) A prefix indicating the presence of two benzenyl radicals, ≡C Ph **d azoxime** $C_{14}H_{10}ON_2$ = 222 2 The heterocyclic compound Ph C

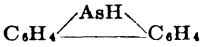


C Ph Colorless crystals, m 108, b 290 **d isazoxime** $C_{14}H_{10}ON_2$ = 222 2 The heterocyclic compound Ph C

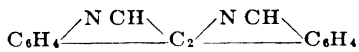


C Ph

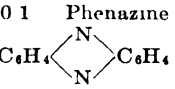
dibenzo- A prefix indicating the presence of two benzo groups, $(>C_6H_4)_2$ **d arsenole** $C_{12}H_9As$ = 228 2 Diphenylene arsine



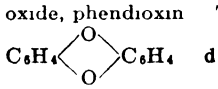
d copyrine $C_{16}H_{10}N_2$ = 230 1 The heterocyclic compound



d diazine $C_{12}H_8N_2$ = 180 1 Phenazine The heterocyclic compound

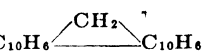


d dioxin $C_{12}H_8O_2$ = 184 1 Diphenylene-dioxide, phendioxin The heterocyclic compound

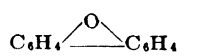


d dithiin Thianthrene

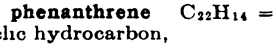
d fluorene $C_{21}H_{14}$ = 266 1 Dinaphthofluorene The homocyclic hydrocarbon



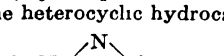
d furane $C_{12}H_8O$ = 168 1 Dibenzofurfurane, biphenyleneoxide diphenyleneoxide,



Colorless crystals, m 81, b 288 **d furane-p-oxazine** Phenoxazine **d furfurane** D furane **d phenanthrene** $C_{22}H_{14}$ = 278 1 The homocyclic hydrocarbon,

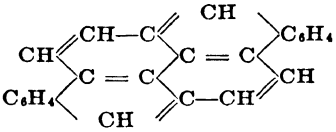


d phenazine $C_{20}H_{12}N_2$ = 280 1 Phenanthrophenazine, phenophenanthrazine, dinaphthazine The heterocyclic hydrocarbon

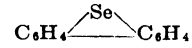


d pyran $C_{18}H_{10}O$ = 182 1 The heterocyclic compound C_6H_4

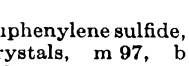
C_6H_4 **d pyrene** $C_{24}H_{14}$ = 302 1



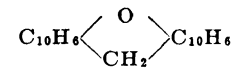
d pyrone Xanthone **d quinoline** Phenanthroquinoline **d selenophene** $C_{12}H_8Se$ = 231 2 Diphenylene selenide



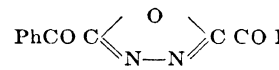
d pyrrole Carbazole **d thiophen** $C_{12}H_8S$ = 186 1 Diphenylene sulfide, C_6H_4



C_6H_4 Colorless crystals, m 97, b 333 **d thioxine** Phenothioxin **d xanthene** $C_{21}H_{14}O$ = 282 2 The heterocyclic compound



dibenzoyl (1) Benzil (2) A prefix indicating the presence of two benzoyl radicals, PhCO— **d catechol** $C_{20}H_{14}O_4$ = 318 21 Colorless crystals, m 84 **d furazane** $C_{16}H_{10}O_3N_2$ = 278 3 The heterocyclic compound



Colorless crystals, m 118 **d glucoxylose** A glucoside, m 148, from *Daniella latifolia*, a Bignoniaceae of Brazil **d ethane** $C_{16}H_{14}O_2$ = 238 1 Diphenazyl, $PhCO\,CH_2\,CH_2\,COPh$ Colorless crystals, m 145 **d ketone** Diphenyltriketone **d malonitrile** $C_{17}H_{14}N_2O_2$ = 278 3 $(PhCO\,C\,NH)_2CH_2$ Colorless crystals, m 130, b 360 **d methane** $C_{15}H_{12}O_2$ = 224 1 $(Ph\,CO)_2CH_2$ Colorless crystals, m 81 **d peroxide** Benzoyl peroxide **d styrene** $C_{22}H_{16}O_2$ = 312 2 Anhydro-acetophenone-benzil, PhCO CH CPh COPh Colorless crystals, m 129

dibenzyl (1) Bibenzyl (2) A prefix indicating the presence of two benzyl radicals, $PhCH_2$— **d amine*** $C_{14}H_{15}N$ = 197 2 A colorless liquid, $d_{14°}$ 1 033, b 300, insoluble in water, soluble in alcohol **d diethyl stannane** $(C_6H_5CH_2)_2SnEt_2$ = 358 89 A colorless liquid, b 223, soluble in alcohol or benzene **d ethane** $C_{16}H_{18}$ = 210 14 Diphenylbutane $Ph(CH_2)_4Ph$ Colorless crystals, m 52, soluble in alcohol **d glycollic acid** Oxatolic acid **d hydrazine** $C_{14}H_{14}N_2$ = 207 3 $(PhCH_2NH—)_2$ Colorless crystals, m 65, used in organic synthesis **d hydroxylamine** $C_{14}H_{13}N_2O$ = 223 5 $(PhCH_2)_2N\,NOH$ **d ketone** $C_{15}H_{14}O$ = 210 09 $Ph\,CH_2\,CO\,CH_2\,Ph$ Colorless crystals, m 33 9, b 231, decomp 360, insoluble in water, soluble in ether **d mercury** $Hg(C_6H_5CH_2)_2$ = 382 72 Colorless brittle needles, soluble in alcohol or benzene

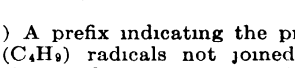
dibenzylidene A compound containing two $=C_7H_6$ or $PhCH<$ radicals **d acetone** Styryl ketone

diborane diphosphine $B_2H_6\,2PH_3$ = 96 1 A white crystalline solid, dissociates above −30 into diborane and phosphine

dibrom-, dibromo- A prefix indicating the presence of two bromine atoms **d acetic acid** $C_2H_2O_2Br_2$ = 217 95 Colorless crystals, m 48, b 232, soluble in water, alcohol, or ether **d anthracene** $C_{14}H_8Br_2$ = 336 0 5 10-, or gamma- Yellow needles, m 221, insoluble in water, slightly soluble in alcohol or ether, soluble in benzene **d anthraquinone** $C_{14}H_6O_2Br_2$ = 366 05 **(alpha-)** Yellow needles, m 237, soluble in alcohol or benzene **(beta-)** Yellow needles, m 275, sparingly soluble in alcohol, soluble in benzene **d barbituric acid** Dibromine **d benzene** See *benzene* **d indigo** $C_{16}H_8O_2N_2Br_2$ = 319 93 Tyrian purple Purple crystals occurring in *Murex* and *Purpura* species **d quinone chloroimide** A reagent for phenols **d thymolsulfonphthalein** An indicator, changing at pH 7 0 from yellow (acid) to blue (basic)

dibromide An inorganic salt containing two negative bromine atoms, and ionizing to two bromide ions, *e g* , $FeBr_2$ = iron dibromide (ferrous bromide)

dibromine $C_4H_2N_2OBr_2$ = 174 0 Dibromobarbituric acid, dibromomalonylureide,



Colorless crystals, m 150, soluble in water alcohol or ether, used as an antiseptic and germicide

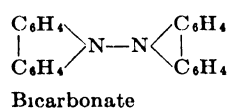
dibutyl (1) A prefix indicating the presence of 2 butyl (C_4H_9) radicals not joined directly, but through a third atom or group (2) Octane **d beryllium** $Be(C_4H_9)_2$ = 123 16 Colorless liquid, b $_{2\ mm}$170, decomp in water **d cadmium** $Cd(C_4H_9)_2$ = 226 55 An oily liquid, d 1 306, m −48, b $_{12\ 5mm}$103 **d ditinbromide** $(C_4H_9)_2SnBr_2$ = 392 67 White needles, m 20 **d phthalate** See *phthalate* **d tinchloride** $(C_4H_9)_2SnCl_2$ = 303 75. Colorless needles, m 43

di-i-butyl- A prefix indicating the presence of two isobutyl radicals **d cadmium** $Cd(C_4H_9)_2$ = 226 55 An oily liquid, d 1 269, m −37, b $_{20mm}$90 5 **d mercury** $Hg(C_4H_9)_2$ = 314 75 Colorless liquid, d 1 835, b 205, slightly soluble in water

dibutyrin $C_{11}H_{20}O_5$ = 232 15 Glyceryl dibutyrate, $C_3H_5(OH)(OOC\,C_3H_7)_2$ Colorless liquid, d 1 803, m −40, b 282, formed by the action of pancreatic lipase on butyrin

dicacodyl See *cacodyl*

dicarbazyl $C_{24}H_{16}N_2$ = 332 3 The heterocyclic ring system



dicarbonate Bicarbonate

dicarboxyl Oxalic acid

dicarboxylic acid An organic compound with two —COOH groups

dicentrine $C_{20}H_{21}O_4N$ = 339 3 An alkaloid from the leaves and seeds of *Dicentra pusilla*, a Fumariaceae, related to glaucine

dicetyl $C_{32}H_{66}$ = 450 5 Dotriacontane The hydrocarbon, $Me(CH_2)_{30}Me$, d 0 781, m 70, b_{15mm} 310

dichlor-, dichloro- A prefix indicating the presence of two chlorine atoms in an organic molecule **d acetal** $C_6H_{12}O_2Cl_2$ = 187 09 A colorless liquid, $d_{14°}$ 1 1383, b 180–185 **d acetamide.** See *acetamide* **d acetic acid** See *acetic acid* **d acetone** See *acetone* **d acetylchloranilide** $C_8H_6NOCl_3$ = 258 5 Cl_3CH-CO NCl Ph Used as a chlorinating agent **d acetyl chloride** C_2HOCl_3 = 147 37 A colorless liquid, b 107, hydrolyzes with water or alcohol, soluble in ether **d aldehyde** See *acetaldehyde* **d amide T** $CH_3C_6H_4SO_2NCl_2$ = 240 06 p-toluene-dichlorosulfamine A pale-yellow, crystalline powder of strong chlorine odor, m 78–83, insoluble in water, soluble in benzene or chloroform, used as an antiseptic **d aniline** See *aniline* **d anthracene** See *anthracene* **d benzene** See *benzene* **d diethyl ether** *2 2'*-D ethyl ether **d diethyl sulfide** Mustard gas **d difluoromethane** CCl_2F_2 = 121 0 Kinetic 12, F12, Freon A colorless gas, d_{-1} 40, m −155, b −30, used as refrigerant **d ethyl ether** $C_4H_8OCl_2$ = 142 98 Dichloroether, dichloroethyl oxide **1 2-** or α,β- $CH_2Cl\,CHCl\,OEt$ A colorless liquid, d 1 174, b 142, soluble in alcohol or ether, used in organic synthesis **2 2-** or β,β'- Dichlorodiethyl ether, $(CH_2Cl\,CH_2)_2O$ A colorless liquid, d 1 213, m −51 7, b 178, insoluble in water, soluble in alcohol, ether, benzene, etc , used as an industrial solvent for fats, waxes, resins and pectins **d ethylene** $C_2H_2Cl_2$ = 96 93 *1 2*-Acetylene dichloride *1 2*-dichloroethene, dieline, dioform, CHCl CHCl A colorless liquid of pleasant odor, d 1 278, m −80 5, b 55 A mixture of the two stereoisomers, *cis*-, d 1 265, m −50, b 48 4, and *trans*- d 1 291, m −80 5, b 60 3 Used as solvent for rubber and lacquer, for the extraction of dyes and perfumes, as a metal degreaser, anesthetic and refrigerant for conditioning air **d hydrin** $C_3H_6OCl_2$ = 128 97 **(alpha-)** Dichlor-isopropyl alcohol, 1 3-dichlor-2-hydroxy-propane, *1 3*-dichloro-*2*-propanol* A colorless, ethereal liquid, $d_{19°}$ 1 367, b 174 m −4, miscible with alcohol or ether Used as a solvent for resins, nitrocellulose, etc and in the manufacture of varnishes, lacquers, water colors, etc **(beta-)** Dichloropropylalcohol, 1 2-dichlor-3-hydroxy-propane, *2 3*-dichloro-*1*-propanol* A colorless liquid, $d_{17°}$ 1 355, b 182 **d methane** Methylene chloride **d naphthalene** See *naphthalene* **d nitrohydrin** $C_3H_5O_3NCl_2$ = 186 0 *1 3*-Dichloro-*2*-propanol nitrate* A colorless liquid, d 1 459, insoluble in water, miscible with alcohol or ether **d phenolindo-o-cresol** An oxidation-reduction indicator **d phenolindophenol** Tillmans' reagent **d phenosulfonphthalein** Used as a pH indicator, changing at 6 0 from yellow (acid) to red (alkaline) **d quinone chloroimide** Used as a reagent for phenols

dichloricide *p*-Dichloro*benzene*

dichloride An inorganic salt containing two chloride chlorine atoms, *e g* , $FeCl_2$

dichroism The property by which certain crystals exhibit different colors when viewed in different directions, or when viewed by reflected or refracted light

dichroite Iolite

dichromate (1) A salt containing the divalent $=Cr_2O_7$ radical (bichromate) (2) Sodium dichromate

dichromatic The property by which certain solutions (*e g* , dyestuffs) exhibit different colors according to the thickness of the layer through which they are viewed Cf *dichroic*

dichromic acid The hypothetical acid, $H_2Cr_2O_7$ or $2CrO_3\ H_2O$, from which the dichromates are derived

dichroscope An optical device for determining the refractive power of crystals

dicinchonine $C_{38}H_{44}O_2N_4 = 588\ 5$ An alkaloid from cinchona bark

dick Ethyl dichlorarsine

dicodeine $C_{72}H_{84}O_{12}N_4$ A polymer of codeine

dicodide $C_{18}H_{21}O_3N = 299\ 15$ Dihydrocodeinone A derivative of codeine

diconchinine Diquinidine

diconic acid $C_9H_{10}O_6 = 214\ 1$ A derivative of citric acid

dicyan (1) An organic compound containing two cyan radicals (2) Cyanogen **d acetylene** $C_4N_2 = 76\ 09$ CN C C CN Colorless crystals or liquid, m 21, b 76 **d diamide** $C_2H_4N_4 = 84\ 18$ Cyanguanidine, param, $NH_2\,C(\,NH)\,NHCN$ An isolog of guanyl urea Colorless leaflets or thin scales, m 205, soluble in water, ether or alcohol **d diamidine** $C_2H_6ON_4 = 102\ 2$ Guanylurea The amide of guanidine carboxylic acid, $NH_2\,C(\,NH)\,NH\text{-}CONH_2$ Colorless crystals, soluble in water or alcohol, m 105 The sulfate is used as a reagent for nickel Cf *Grossmann reagent*

dicyamide A salt containing two cyanide radicals **d imide** $C_2HN_3 = 67\ 2$ CN NH CN

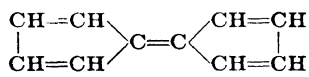
dicyanin(e) An aniline dye used as a photographic sensitizer for infrared radiations **d A** $C_{21}H_{27}N\,O_2I = 466\ 2$ *1 1'*-Diethyl-*4 2'*-dimethyl-*6 6'*-diethoxy-*2 4'*-carbocyanin iodide A quinoline dye used as photosensitizer for infra-red Cf *cyanin dyes*

dicyanodiamide Dicyandiamide

dicyanogen. $C_2N_2 = 52\ 0$ Oxalonitrile, ethane dinitrile, CN—CN A colorless, poisonous gas, b -25 Cf *cyanogen*

dicyclic Describing a ring system consisting of two fused rings, as, naphthalene, quinoline, indene, but not biphenyl

dicyclopentadiene $C_{10}H_8 = 128\ 0$ The homocyclic compound



didial A combination of diallyl-barbituric acid and ethylmorphine

didiphenylene ethylene Difluorene

didiphenylamine- A prefix indicating the presence of two diphenylamine radicals, as, **d fluosilicate.** $[(C_6H_5)_2NH]_2\ H_2SiF_6 = 482\ 26$ White crystals, m 169

didymia Didymium oxide

didymium Di A supposed element, of the rare earth group, discovered by Mosander in 1841, in the earth didymia, it is a mixture of neodymium and praseodymium "Didymium salts" are obtained as by-products in the manufacture of gas mantles but are mixtures of neodymium and praseodymium salts, hence, the symbol, Di, in the following salts means Nd and Pr **d carbonate** $Di_2(CO_3)_6\ 6H_2O$ Pinkish powder, insoluble in water, soluble in acids **d chloride** $DiCl_6\ 12H_2O$ Large purple or rose-red crystals, soluble in water or alcohol, used as a germicide **d nitrate** $Di_2(NO_3)_6\ 12H_2O$ Large, purple or rose-red, asymmetric crystals, soluble in water or alcohol, used as an antiseptic **d oxide** Di_2O_3 Gray powder, insoluble in water or alcohol, soluble in dilute acids **d salicylate** $Di_2(C_7H_5O_3)_6$ Dymal A fine, white powder, used as an antiseptic dusting powder **d sulfate** $Di_2(SO_4)_3\ 6H_2O$ Pale, rose red crystals, slightly soluble in water, insoluble in alcohol, used as a disinfectant

dielectric An insulator or non-conductor of electricity **d constant** ϵ Inductivity Specific inductive capacity The constant, ϵ, which depends upon the nature of the medium and is given by $\epsilon = ee'/fr^2$, where f is the force of repulsion between two point charges e and e' of electricity which are at a distance, r, apart in a uniform medium Cf *Clausius Mosotti equation, Helmholtz equation*

dieline Dichloroethylene

Diel's hydrocarbon $C_{18}H_{16}$ It is the theoretical basis of the sterol molecule

diene A suffix indicating the presence of two double bonds **d series** Diolefines

Diesel fuel Heavy fuel oil in which combustion is started by spontaneous ignition due to compression, instead of by spark-plugs

diet The customary or prescribed food rations of an individual

dietary A systematized and regular diet repeated at definite time intervals, *e g* , a week or month **d standard** The amount of nourishment required per day by a man, corresponding with 3000 calories or more, and varying according to the work performed by the individual This includes 120 grams protein (429 calories), 500 gm carbohydrates (2050 calories), and 50 gm fat (465 calories) in addition to mineral matter and vitamins Cf *pellidiet*

Dieterici's Rule The internal latent heat is a function of the ratio of vapor volume to liquid volume

$$M\lambda = P(V_2 - V_1) + CRT \ln \frac{V_2}{V_1}$$

total latent heat = *external work* + *internal latent heat*,

where V_2 is the molal fraction of the liquid, V_1 that of the vapor, M the molecular weight, λ the latent heat

diethacetic acid Diethylacetic acid

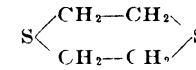
diethoxalic acid $C_6H_{12}O_3 = 132\ 1$ 1-hydroxy-1-ethyl-butyric acid Colorless triclinic crystals m 80, soluble in water, alcohol, or ether

diethanolamine $C_6H_{11}NO_2 = 105\ 09$ Dihydroxy diethylamine, $NH(CH_2\,CH_2OH)_2$ A colorless liquid, d 1 10, b $_{150mm}$217, used as solvent, emulsifying agent and detergent Cf *triethanolamine*

diethyl- A prefix indicating the presence of two ethyl radicals **d acetal** Acetal **d acetic acid** See *acetic acid* **d aldehyde** Acetal **d amine*.** $C_4H_{11}N = 73\ 12$ The secondary amine Et_2NH, occurring in putrefying fish A colorless liquid, $d_{15°}$ 0 712, b 56, m −40, soluble in water, alcohol, or ether **d aminobenzaldehyde** $C_{11}H_{15}ON = 177\ 2$ Colorless needles, m 78, b 280 **d aminophenol** $C_{10}H_{15}ON = 165\ 18$ Colorless crystals, m 74, b 276 **d aniline** See *aniline* **d arsine** (1) $C_4H_{11}As$ Ethyl cacodyl, Et_2AsH (2) $(AsEt_2)_2 = 266\ 02$ Colorless liquid, b 186 **d arsinic acid** $C_4H_{10}O_4As$ Ethyl cacodylic acid $(EtO)_2AsO(OH)$ **d barbituric acid** Veronal **d benzene** See *benzene* **d beryllium** $BeEt_2 = 67\ 10$ A colorless liquid, m 12, b $_{15mm}$110 **d cadmium** $CdEt_2 = 170\ 49$ An oily liquid, d 1 656, m −21, b $_{19\ 5mm}$640 **d carbinol** $C_5H_{12}O = 88\ 13$ $CHEt_2OH$ A col-

orless liquid, $d_0°$ 0 832, b 116, sparingly soluble in water, soluble in alcohol or ether **d carbonate** $C_5H_{10}O_3$ = 118 1 Diatol, Et_2CO_3 A colorless liquid, d 0 968, b 125 Used as a solvent for nitrocellulose, and in lacquer manufacture **d carbonic ether** Ethyl carbonate **d cyanamide** $C_5H_{10}N_2$ = 98 08 A colorless liquid, b 186 **d dioxide** $C_4H_{10}O_2$ = 90 1 Ethylperoxide, diethylperoxide, EtO-OEt A colorless liquid, d 0 825, b 65, slightly soluble in water, soluble in alcohol or ether **d disulfide** $C_4H_{10}S_2$ = 122 21 Dithiene Colorless liquid, d 0 993, b 153 5, very slightly soluble in water It is toxic to *Ascaris* **d ether** Ether(2) **d glycerol** $C_7H_{16}O_3$ = 148 2 The etheralcohol $CH_2OEt\ CHOH\ CH_2OEt$ A colorless liquid, b 191, used as a solvent Cf *diethyline* **d glycol ether** Ethylene diethylate **d hydrine** Diethyline **d ketone** $C_5H_{10}O$ = 86 09 3-pentanone, Et-COEt A colorless, liquid, d 0 814, b 103, soluble in water, alcohol, or ether, used medicinally as a hypnotic **d malate** $C_8H_{14}O_5$ = 190 1 The ester EtOOC CHOH COOEt A colorless liquid, b 250, soluble in water or alcohol Used as a constituent of lacquers **d malonic acid** See *malonic acid* **d malonylurea** Veronal **d mercury** $HgEt_2$ = 258 69 Colorless liquid, d 2 44, b 159, insoluble in water **d nitramine** See *nitramine* **d nitrosamine** Nitrosodiethyline **d oxalic acid** Diethoxalic acid **d oxamide** $C_6H_{12}O_2N_2$ = 144 21 Oxal ethyline A nicotine alkaloid, EtNH CO CO NHEt Colorless needles, m-175, slightly soluble in water or ether, soluble in alcohol **d peroxide** D dioxide **d phosphate** Ethyl phosphate **d phosphine** $C_4H_{11}P$ = 90 11 Et_2PH A colorless liquid, b 85 **d phosphoric acid** $C_4H_{11}O_4P$ = 154 12 $(EtO)_2PO\ OH$ A colorless liquid, soluble in water, slightly soluble in alcohol **d phthalate** See *phthalate* **d propylcarbinol** Octanol* **d sulfate** Ethyl sulfate **d sulfide** Ethyl sulfide (*dichloro-*) Mustard gas **d sulfine** The bivalent radical > SEt_2 **d sulfone** Ethylsulfone **d sulfone diethylmethane** Tetronal **d sulfone dimethylmethane** Sulfonal **d sulfone ethylmethylmethane** Trional **d sulfone methylethylmethane** Trional **d tartrate** $C_8H_{14}O_6$ = 206 1 The ester EtOOC-$(CHOH)_2$ COOEt A colorless liquid, b 280, soluble in water or alcohol, used as a solvent for nitrocellulose, gums and resins **d telluride** Ethyl telluride **d thiurea** Ethylthiourea **d tin** $SnEt_2$ = 176 78 Yellowish oily liquid, d 1 654, m below −12, b 150, insoluble in water **d tin dibromide** Et_2SnBr_2 = 336 61 White needles, d 2 068, m 63, b 232 **d tin dichloride** Et_2SnCl_2 = 247 69 White crystals, m 84, b 220 **d tin difluoride** Et_2SnF_2 = 214 78 White plates, m 229 **d tin diiodide** Et_2SnI_2 = 430 62 White crystals, m 45, b 242 **d tin oxide** Et_2SnO = 192 78 White powder, insoluble in water **d toluene** See *toluene* **d toluidine** $C_{11}H_{17}N$ = 163 22 $Me\ C_6H_4\ NEt_2$ **para-** A colorless liquid, d-0 9242, b 229 **d urea** See *urea* **d zinc** $ZnEt_2$ = 123 46 A colorless liquid, d 1 182, b 118, which ignites in air

diethylene (1) Cyclobutane (2) A prefix indicating the presence of two ethylene radicals **d diamine** Piperazine **d dioxide** Dioxan **d disulfide** $C_4H_8S_2$ = 120 20 Dithiane



Colorless crystals, m 111, b 200, insoluble in water, soluble in alcohol or ether **d glycol** $C_4H_{10}O_3$ = 106 1 2 2′-Oxybisethanol, *2 2′*-oxydiethanol* The ether-alcohol, $CH_2OH\ CH_2O\ CH_2\ CH_2OH$ A colorless liquid, d 1 1175, b 224 5, miscible with water, alcohol, ether or acetone, used as a solvent for gums, resins and nitrocellulose, as a hygroscopic agent in cigarettes, as an antifreeze in refrigerators, sprinklers, water seals, and as a softener for glues, paper and cork **d glycol butyl ether** Butyl carbitol **d glycol ethyl ether** Carbitol **d oxide** Dioxan

diethylethylene Δ^3-Hexylene

diethylidene (1) 2-Butylene (2) A prefix indicating the presence of two ethylidene radicals, > CHMe

diethylin (1) The monovalent radical, —NEt_2, derived from diethylamine (2) Diethyline

diethyline $C_7H_{16}O_3$ = 148 1 1 2-Diethylglycerinester $C_3H_5OEt\ CHOEt\ CH_2OH$ A colorless liquid Cf *diethyl glycerol* **nitroso-** $C_4H_{11}ON_2$ = 102 09 Nitrosodiethylamine, diethylnitrosamine, $Et_2N\ NO$ A colorless liquid, d 0 951, b 177, used in organic synthesis

dietics, dietetics The science of the regulation of food in health and disease

dietzeite $7Ca(IO_3)_2\,8CaCrO_4$ A native calcium chromate and iodate, which occurs in the Chilean nitrate beds

differential By selective increments **adsorption-** The selective adsorption of dyestuffs, *e g* , some indicators, (q v) are adsorbed more in the presence of halogen ions than of others **d reduction** The selective reduction by metals of one component in a mixture

differentiation (1) In mathematics Defining an infinitesimal increment of a quantity (2) In biology The development of new characteristics of a cell or organism In an evolutionary sense it means the specialization and division of labor between the various cells, tissues, or organs

diffraction The bending of a ray of light as it strikes the edge of an object Cf *refraction* Interference color fringes are produced when a number of parallel light waves strike a number of closely spaced parallel edges forming a grating Hertzian waves are analyzed by a coarse grating constructed of copper wires X-rays are analysed by the rows of atoms in a crystal **crystal-** See *x-ray spectrograph, crystal* **d formula** The wavelength of a radiation is $\lambda = s \sin d/n$, when the angle of incidence is 90°, or $\lambda = (s/n)(\sin i - \sin d)$, where i is the angle of incidence, d the angle of diffraction, s the distance between the rulings of the grating (or the planes of atoms in a crystal) and n the order of the spectrum **d grating** A glass, film, or metal plate with fine rulings, used to produce a series of spectra, and for spectroscopic measurements Opaque or transparent gratings are used

diffusate That part of the liquid which passes through a dialyzer (q v) and contains the crystalloids

diffuse (1) Hazy in appearance (2) Passing through a membrane (3) Spreading through a gas, liquid or solid **d series** See *series*

diffused (1) Widely scattered, without definite limits, *e g*, diffused light, diffused gases (2) Spreading or passing through an object, *e g*, diffused crystalloids, diffused poison **d reflection** The ratio of reflected to incident light, falling on a surface See *albedo*

diffusion The spreading, or scattering of a material (gas, liquid), or energy (heat, light) **d analysis** Determination the size of particles and the molecular weight by diffusion **d of energy** The irregular reflection of light or heat waves from the surface of a body, part being absorbed **d of matter** The spreading or intermixing movement of gaseous or liquid substances, due to molecular movement Thus, gases mix rapidly, and two liquids or solutions brought into contact will, in time, mix thoroughly (provided they are miscible) Even solids pressed together show diffusion to a small extent (*e g*, gold and lead) **d constant** The constant D in the relation

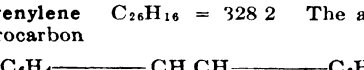
$$S = -D\frac{q\,c\,t}{x}$$

where S is the weight of substance diffusing in t seconds through a cylinder of length x and cross-section q, and c is its concentration in grams per cc **d law** The velocity (v) of diffusion of two substances is in inverse proportion to the square-root of the vapor-density (d) or molecular weight (M), hence $v_1\ v_2 = \sqrt{d_2}\ \sqrt{d_1} = \sqrt{M_2}\ \sqrt{M_1}$ Cf *Graham's law, atmolysis* **d shell** A membrane for dialysis (*dialyzer*)

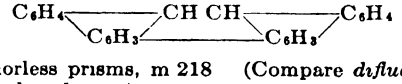
difluan $C_6H_4O_6N_2$ = 200 2 A compound obtained by boiling alloxanic acid

difluor-, difluoro- A prefix indicating the presence of two fluorine atoms **d benzene** Benzene **d dichloromethane** Dichlorodifluoromethane

difluorene $C_{26}H_{16}$ = 328 2 Didiphenylene-ethylene



difluorenylene $C_{26}H_{16}$ = 328 2 The aromatic hydrocarbon



Colorless prisms, m 218 (Compare *difluorene, dihydrorubicene*)

difluoride A compound containing two fluorine atoms, as a fluoride

diformyl Glyoxal

digallic acid $C_{14}H_{10}O_9$ = 322 08 $C_6H_2(OH)_2$-$COOC_6H_2(OH)_2COOH$ Fine white needles, m 275 (foam and decomp) slightly soluble in water or ether, soluble in alcohol or hot water It occurs in Chinese tannin and in plant galls

digentisic acid $C_{14}H_{10}O_7$ = 290 08 C_6H_3-$(OH)_2$ COO $C_6H_3(OH)_2COOH$, occurs in tannins Fine needles, m 204, slightly soluble in water

digestant A drug which aids digestion

digester A large iron kettle with cover and safety valve, used to subject, decompose, soften or cook substances at high pressure and temperature See *autoclave*

digesting shelf A rack for holding Kjeldahl flasks

digestion (1) In physiology, the metabolic transformation of food into living matter, *e g*, the change of proteins, carbohydrates, and fats, under the influence of ferments, into assimilable substances (2) The treatment of substances with chemicals under heat and pressure, *e g*, wood to make wood pulp (3) The disintegration of substances by strong chemical agents, *e g*, the decomposition of proteins with sulfuric acid in Kjeldahl determination **artificial-** Digestion of food by ferments outside the living body **gastric-** Digestion occurring in the stomach, *e g*, the action of pepsin in changing proteins to peptones **intestinal-** Digestion in the intestines **oral-** Salivary d **peptic-** Gastric d **primary-** Gastro-intestinal digestion **salivary-** Digestion in the mouth, *e g*, diastase changes starch to dextrin **secondary-** Assimilation of food by body-cells

digifolin A solution of glucosides from digitalis leaves

digilanide A glucoside, m 245–248, from *Digitalis lanata*, hydrolyzing to 2 mols digitoxose, 1 mol digilanidobiose and an aglucone

d A $C_{49}H_{76}O_{19}$, yields digitoxegenin
d B $C_{49}H_{76}O_{20}$, yields gitoxegenin
d C $C_{49}H_{76}O_{20}$, yields digoxegenin

digipoten A mixture of glucosides from digitalis leaves

digit (1) Three-fourths of an inch (2) A measure of the amount of an eclipse, one-twelfth of the apparent diameter of the sun or moon (3) An integer under 10

digitalein $C_{22}H_{38}O_9$ = 446 4 A glucoside of digitalis leaves A white amorphous powder, soluble in water, used as a diuretic and cardiac tonic

digitaligenin $C_{24}H_{32}O_3$ = 368 24 A split-product from the glucoside of digitalis seeds

digitalin $(C_5H_8O_2)x$ A glucoside from digitalis leaves **amorphous-** Crude d **crude-** Amorphous- A mixture of glucosides (digitoxin, digitalin, and digitalein) Amorphous, yellow powder, soluble in water or alcohol giving foaming solutions, insoluble in chloroform or ether **crystalline-** Digitonin **French-** Homolle's- A mixture of glucosides from digitalis leaves prepared by Homolle's method Yellowish-white, amorphous powder, m 100 **German-** A mixture of glucosides from digitalis leaves prepared by the Wals method, mainly digitonin Yellowish-white, amorphous powder, soluble in water or alcohol, insoluble in ether or chloroform **true-** $C_{35}H_{56}O_{14}$ = 680 3 Digitalin verum, Schmiedeberg's digitalin A glucoside from the seeds and leaves of digitalis An amorphous, white powder or granules, m 217, soluble in 100 parts water, or 100 parts 50 % alcohol

digitalis The seeds or leaves of *Digitalis purpurea* (foxglove), a Scrophulariaceae Used medicinally as a narcotic, cardiac, and stimulant Many different glucosides and active principles have been isolated from it, but its active principle is still doubtful

digitalose A methyl pentose from digitalis

digitogenin $C_{26}H_{42}O_5$ = 434 3 A split product of digitonin

digitonin $C_{54}H_{92}O_{28}$ = 1188 7 A glucoside from digitalis leaves Colorless crystals, decomp on heating, nearly insoluble in water, ether or chloroform, soluble in a mixture of alcohol and chloroform It is physiologically inactive, and hydrolyzes to glucose, galactose and digitogenin

digitoxigenin $C_{24}H_{36}O_4$ = 388 3 Colorless crystals, m 245, physiologically active **anhydro-** $C_{24}H_{34}O_3$ = 370 3 Colorless crystals, m 184, physiologically inactive

digitoxin $C_{34}H_{54}O_{11}$ = 638 42 A glucoside from digitalis leaves, assumed to be the chief active principle Thin white, rectangular, anhydrous leaflets, odorless with bitter taste, m 240, slightly soluble in water or ether, soluble in alcohol or chloroform, insoluble in benzene

digitoxose $C_6H_{12}O_4$ = 148 09 *3 4 5*-Trihydroxyhexanal A crystalline split-product of digitoxin and gitoxin

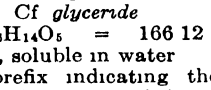
diglyceride A compound of the type $HO-C_3H_5(OR)_2$ Cf *glyceride*

diglycerin $C_6H_{14}O_5$ = 166 12 A colorless liquid, b 225, soluble in water

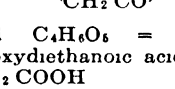
diglycol A prefix indicating the presence of two $—CH_2OH$ groups **d laurate** An odorless, pale yellow oil, emulsible in water, soluble in all proportion in alcohols, oils and hydrocarbons

diglycollamic acid $C_4H_7O_4N$ = 133 08 Colorless, rhombic prisms, m 150, decomp on further heating, soluble in water or alcohol

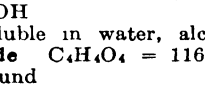
diglycollamide anhydride $C_4H_5O_3N$ = 115 1 Diglycolloimide The heterocyclic system



diglycollic acid $C_4H_6O_5$ = 134 07 Oxybisacetic acid, oxydiethanoic acid* The dibasic acid $O(CH_2COOH)_2$ Colorless, rhombic prisms, m 148, soluble in water, alcohol, or ether **d anhydride** $C_4H_4O_4$ = 116 0 The heterocyclic compound



Colorless crystals, m 97, b 240, soluble in alcohol

diglycollide $C_4H_4O_4$ = 116 0 The heterocyclic compound  Colorless crystals, m 86

diglycolloimide Diglycollamide anhydride

digoxigenin $C_{23}H_{34}O_5$ = 390 3 A hydrolysis product, digoxin, m 220°C

digoxin $C_{41}H_{64}O_{14}$ = 780 5 An optically active glucoside, from digitalis, m 265, hydrolyzes to 3 mol digitoxose and digoxigenin

dihexyl (1) Two hexyl radicals (2) Dodecane*

dihydracrylamic acid Dilactamic acid

dihydracrylic acid $C_6H_{10}O_5$ = 162 09 Colorless crystals, decomp on heating Soluble in water, alcohol, or ether

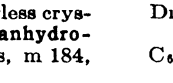
dihydranol $C_6H_3(OH)_2CH_2(CH_2)_3CH_3$ *n*-Heptylresorcinol, *2 4*-dihydroxy-phenyl-*n*-heptane Used as 5 % solution in olive oil against intestinal putrefaction

dihydrate (1) A compound containing two hydroxyl groups (2) A crystal containing two molecules of water of crystallization

dihydric Dibasic

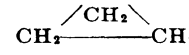
dihydride A binary compound containing two hydrogen atoms, *e g* , CaH_2

dihydro- A prefix indicating the presence of two additional hydrogen atoms in an organic compound **d anthracene** $C_{14}H_{12}$ = 180 1 Diphenylene-dimethylene The hydrocarbon

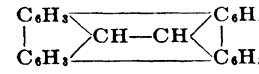


d benzide See *benzene*

d bromide An organic compound containing two molecules of HBr, *e g* , morphine dihydrobromide **d butene** C_4H_6 = 54 1 **1 2-** The hydrocarbon CH_2 C CHMe **1 3-** The hydrocarbon CH_2 CH CH CH_2 **d carveol** $C_{10}H_{18}O$ = 154 16 8(9)-Terpene-ol-2 A colorless liquid, $d_{22°}$ 0 927, b 225 **d carvone** $C_{10}H_{16}O$ = 152 16 8(9)-Terpene-ol-2 A colorless liquid, $d_{19°}$ 0 928, b 222 **d cholesterol** Formed from cholesterol in the body, and excreted in the gut **d cymene** $C_{10}H_{16}$ The terpadienes limonene, phellandrene, terpinene, etc **d lutidine** $C_7H_{11}N$ = 109 07 A ptomaine from cod-liver oil **d naphthalene** Dialin **d pentine** C_5H_8 = 68 06 **2 4-** Piperylene, MeCH CH CH CH_2 **2 3-** The hydrocarbon MeCH C CHMe **d propene** C_3H_6 = 42 1 The homocyclic system

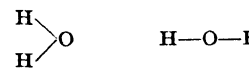


See *cyclopropane* **d quinazoline** See *orexin, quinazoline* **d quinoline** C_9H_9N = 131 08 A colorless liquid, b 223 **d resorcinol** $C_6H_6O_2$ = 112 07 Colorless prisms, decomp 105, soluble in water, alcohol, or ether **d rubicene** $C_{26}H_{14}$ = 326 1 The octocyclic hydrocarbon



Colorless needles, m 296 Cf *difluorene, difluorenylene*

dihydrol A supposed polymerized form of liquid water, $(H_2O)_2$, which exists in equilibrium with the normal molecule $2H_2O \leftrightarrows (H_2O)_2$ It is assumed to have the formula

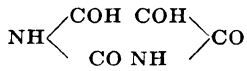


Cf *trihydrol, hydrone theory, bonds*

dihydroximic acid $C_2H_4N_2O_4$ = 120 0 Hydroximic acid HON C(OH)—C(OH) NOH

dihydroxy A prefix indicating the presence of two hydroxyl groups **d acetone** $C_3H_6O_3$ = 90 1 The ketone alcohol $(CH_2OH)_2CO$ A colorless solid substance, m 70, converted by alkali into fructose **d acetic acid** Glyoxalic acid **d anthraquinones** A group of dibasic phenols derived from anthraquinone **1 2-** Alizarin **1 3-** Xanthopurpurin **1 4-** Quinizarin **1 5-** Anthrarufin **1 8-** Chrysazin **2 3-** Hystazarin **2 6-** Anthraflavic acid **2 7-** Isoanthraflavic acid **b benzene 1 2-** Catechol **1 3-** Resorcinol **1 4-** Quinol **d benzoic acid** See *benzoic acid* **d benzophenone** $C_{13}H_{10}O_3$ = 214 08 HO C_6H_4 CO C_6H_4 OH Isomers 2 5- m 122, 2 2'- m 59, b 340, 2 3'- m 126, 3 4'- m 197, 4 4'- m 210 **d cholenic acid** $C_{24}H_{38}O_4$ = 582 3 An isomer of apocholic acid, cf *sterols* Long needles, m 260 **d cinnamic acid** Caffeic acid **d disulfonic acid** Chromatropic acid **d fluorescein** Gallein **d naphthalene** $C_{10}H_8O_2$ = 160 11 **(alpha-)** 1 4- **(amphi-)** 2 6- **(ana-)** 1 5- **(beta-)** 2 3- **(epi-)** 1 6- **(kata-)** 1 7- **(peri-)** 1 8- **(pros-)** 2 7- **1 6-** or epi- Colorless prisms, m 134, soluble in alcohol or ether

1 7- kata- Colorless needles, m 178, soluble in water, alcohol, or ether **1 8-** peri- Colorless needles, m 140, slightly soluble in water, soluble in alcohol or ether **2 3-** beta- Rhombic, colorless, crystals, m 159, soluble in hot water, alcohol, or ether **2 7-** pros- Colorless needles, m 261, slightly soluble in water, soluble in alcohol or ether **d palmitic acid** $C_{16}H_{32}O_4$ = 288 0 White needles, m 125, occurring in cod-liver oil **d phthalophenone** Phenolphthalein **d propionic acid** Glyceric acid **d stearic acid** $C_{18}H_{36}O_4$ = 316 28 Rhombic crystals, m 126 5, found in castor oil, there are ten isomers **d succinic acid** Tartaric acid **d uracil**



An intermediate in the synthesis of uric acid

dihydroxyl Dihydroxy **d amine** The hypothetical hydroxy-hydroxylamine, HO NH-OH **d nicotine** Pilocarpidine

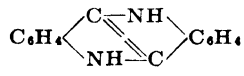
diimide (1) The hypothetical compound HN-NH, known only as its organic derivatives (2) A compound containing two —C NOH groups, as, glyoxime

diimines A group of organic compounds which contain two imine, =NH, radicals

diimino- A prefix indicating the presence of two imino groups **d hydrazine** N_4H_2 The hypothetical compound HN N N NH, known as its derivatives Cf *hydronitrogen*

diindogen Indigotin

diindyl $C_{14}H_{10}N_2$ = 206 2 Diindyl The heterocyclic compound



Cf *biindyl*

diine A suffix indicating the presence of two triple bonds See *diacetylenes*

diiod-, diiodo- A prefix indicating the presence of two iodine atoms in an organic compound **d acetic acid** $C_2H_2O_2I_2$ = 311 97 Diiodoacetic acid Yellow crystals, m 110, slightly soluble in water **d acetylene** C_2I_2 = 277 7 Small needles, insoluble in water, soluble in oil of sweet almond **d hydrine** Diiodoisopropanol **d tyrosine** $C_9H_9NO_3I_2$ = 432-96 White crystals, m 205, slightly soluble in water An amino acid found in gorgonin, spongin and thyroglobulin

diiodide A compound containing two iodine atoms as iodide, *e g*, mercury diiodide, HgI_2

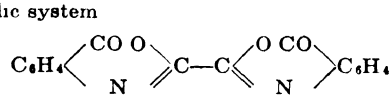
diiodoacetic acid Diiodacetic acid

diiodobenzene $C_6H_4I_2$ = 329 90 **o-** Soluble in water or alcohol, m 23 4, b 279 **m-** Soluble in alcohol, m 34 2, b_{771mm} 286 5 **p-** Soluble in alcohol, m 129 4, $b_{756.5mm}$ 284 7

diiodoeosin See *rose bengal*

diiodoform C_2I_4 = 531 4 Tetraiodoethylene, ethylene periodide, $I_2C\ CI_2$ Bright-yellow, odorless, needles, insoluble in water, slightly soluble in alcohol, readily soluble in chloroform and decomp by light, used as antiseptic

diisatogen $C_{16}H_8O_4N_2$ = 292 3 The heterocyclic system

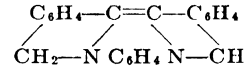


Cf *isatogenic acid*

diisoamyl (1) 2 7-Dimethyl-octane (2) A prefix indicating the presence of two isoamyl groups **d amine** $C_{10}H_{23}N$ = 157 27 A colorless liquid, d 0 788, b 190, slightly soluble in water, miscible in alcohol or ether **d ketone** $C_{11}H_{22}O$ = 170 24 A yellow liquid, b 226 insoluble in water, miscible with alcohol or ether

diisobutyl (1) The compound 2 5-dimethyl-hexane (2) A prefix indicating the presence of two isobutyl groups **d amine** $C_8H_{19}N$ = 129 24 A colorless liquid, $d_{14°}$ 0 7577, b 139 5, sparingly soluble in water, miscible with alcohol or ether **d ketone** $C_9H_{18}O$ = 142 23 Valerone $Me_2C\ CO\ CMe_3$ A colorless liquid, $d_{20°}$ 0 833, b 181, insoluble in water

diisoindoloquinoxaline $C_{22}H_{16}N_2$ = 308 2 The heterocyclic compound



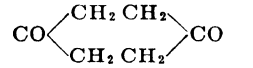
diisonitrosoanetholperoxide $C_9H_8O_2N_2$ = 176 2 Colorless crystals, m 97

diisopropenyl (1) C_6H_{10} = 82 078 *2 3-*Dimethyl butadiene $CH_2\ CMe\ CMe\ CH_2$ A colorless liquid, d 0 731, b 69 6 Cf *hexine, hexadiene* (2) A prefix indicating the presence of two isopropenyl groups

diisopropyl (1) A prefix indicating the presence of two isopropyl radicals (2) An isomer of hexane (2 3-dimethyl-butane or dimethyl-isopropylmethane) **d ketone** $C_7H_{14}O$ = 114-12 A colorless liquid, $d_{16°}$ 0 853, b 123 7, soluble in alcohol or ether

dika fat The fat of *Irvingia gabonensis*, a Simarubaceae, from Sierra Leone

diketo- A prefix indicating the presence of two bivalent =CO groups **d hexamethylene** $C_6H_8O_2$ = 112 1 The homocyclic compound



d hydrindene Is *indandione*

diketone A compound containing two —CO radicals **1 2-** A compound containing the bivalent —CO CO— radical, *e g*, diacetyl or 2 3-butanone **1 3-** A compound containing the bivalent —CO CH_2 CO— radical, *e g*, acetyl-acetone or 2 4 pentanone **1 4-** A compound containing the bivalent —CO CH_2-CH_2 CO— radical, *e g*, acetonyl-acetone or 2 5-hexanone **alpha-** 1 2- **beta-** 1 3- **gamma-** 1 4-

diketopenthiazoline $C_4H_5O_2NS$ = 131 2 Sinapan-propionic acid Colorless crystals, m 150

diketopurine Xanthine

diketotriazolidine Urazole

diketotrimethylpurine Caffeine

dilactamic acid $C_6H_{11}O_4N$ = 161 2 MeCH-OH COO CHMe $CONH_2$ Colorless crystals, soluble in water

dilactic acid $C_6H_{10}O_5$ = 162 1 (1) Lactyl-lactate, lactolactic acid MeCHOH COO CH-Me COOH (2) Lactylic anhydride, lactic acid anhydride MeCHOH CO O CO CHOH-Me

dilatancy A form of thixotropy (q v) in which a viscous suspension sets solid under the influence of pressure

dilatation Distention or expansion

dilatometer An instrument for measuring expansion (*dilation*) due either to a change in temperature or to chemical action

dilatometry The measurement of small volume changes in liquids, due to physical or chemical reactions, as, esterification

dilaudide $C_{17}H_{19}O_3$ HCl Dihydro-morphinone hydrochloride A white powder, soluble in water, used as heroine substitute

dilevulinic acid $C_{10}H_4O_6$ = 220 0 Decane-4 7-dione diacid The dibasic keto-acid, (—CH_2-CO CH_2 CH_2 COOH)$_2$

dilituric acid 5-Nitrobarbituric acid

dill Anetum The dried ripe fruit of *Peucedanum graveolens*, a Compositae, used as a spice and carminative **d oil** The essential oil of d , d 0 895–0 915, soluble in alcohol It contains phellandrene, terpinene and carvone

diluent (1) An inert, solid or liquid, used to increase the bulk of some other substance (2) An inert substance used to increase the bulk of a solution, it need not necessarily be a solvent for the dissolved substance (3) A liquid added to the solvents and plasticizers of lacquers to increase flow and evaporation, as, benzene, toluene, xylene

dilution (1) The process of diluting, increasing the bulk of a substance by adding a material (2) The state of being diluted or diffused, as, a solute in a solvent **heat of-** The heat, in gram calories, which is liberated or absorbed on diluting infinitely one gram molecule of a substance with water

d law Ostwald's law **d ratio** A measure of the solvent power of a diluent (definition 2) It equals the volume of a diluent required to produce incipient precipitation of a dissolved substance, divided by the total volume of solvent in which it occurs **d rule** To mix or dilute a with b to make c, use the diagram

a \ c / (difference c − b) = x
b / \ (difference a − c) = y

and take x parts of a and y parts of b, where a, b, and c are expressed in the same unit (*e g* , of percentage, moles, karats, density, price) With solutions to be diluted with water, b is zero concentration or 1 0 density, thus Dilute a 75 % solution (a) with water (b) to make it 55 % (c) strong—

75 \ / (55 − 0) = 55
55
0 / \ (75 − 55) = 20

take 55 parts of 75 % solution and add 20 parts of water

dimalonic acid $C_6H_6O_8$ = 206 03 Ethane-tetracarboxylic acid The tetrabasic acid CH(COOH)$_2$ CH(COOH)$_2$

dimazon $C_{18}H_{19}O_4N_3$ = 341 3 Diacetylamino-azotoluene A red dye, related to scarlet R An orange-red crystalline powder, m 75, insoluble in water, soluble in alcohol, ether, or chloroform Used medicinally in ointments or as a dusting powder to promote the growth of epithelial tissue

dimedone $C_8H_{10}O_2$ = 138 08 Dimethylcyclohexanedione

CO CHMe CH_2 CO CHMe CH_2

dimension A magnitude in one definite direction **four-** The concept of space and time, as, length, width, height and duration **three-** The concept of space

dimensional equation A mathematical expression showing the dimensions of a quantity in terms of fundamental units, (q v) thus energy = ML^2T^{-2}, where M is mass, L is length, and T is time

dimercurammonium The monovalent HgN— radical **d chloride** HgNCl = 250 1 A yellow powder **d oxide** $(HgN)_2O$ = 445 2 A colorless powder

dimercuriammonium Dimercurammonium

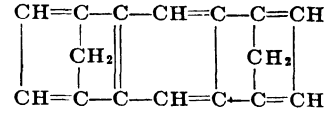
dimercurousammonium The monovalent —Hg-NH_2 radical

dimer A condensation product or polymer of two molecules Cf *trimer, dimeric*

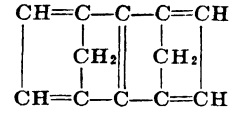
dimeric Able to form two-fold polymers

dimethacetic acid Dimethylacetic acid

dimethano- A prefix indicating the presence of two —CH_2—bridges in a ring, as, **d anthracene**



d naphthalene

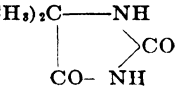


dimethoxalic acid Isobutyric acid

dimethoxy- A prefix indicating the presence of two methoxy radicals, —OCH_3, or —OMe **d. catechol** Veratrol **d ethane** $C_4H_{10}O_2$ = 90 08 Glycol dimethyl ether, $MeOCH_2$ CH_2-OMe A colorless liquid, d 0 873, b 84 5, used as a solvent in lacquers **d phthalaldehydic acid** Opianic acid

dimethyl (1) Ethane (2) A prefix indicating the presence of two methyl radicals **d acetal,** $C_4H_{10}O_2$ = 90 1 Ethylidene dimethylether $(MeO)_2CH$ Me A colorless liquid, $d_0°$ 0 879, b 62 5, miscible with water, alcohol, ether or chloroform Used medicinally as an anesthetic instead of chloroform **d acetic acid** Isobutyric acid **d acetylene** Crotonylene **d allylene** 3-Methyl-butine **d amine*** C_2H_7N = 45 11 The secondary amine Me_2NH A volatile liquid or colorless vapor, $d_6°$ 0 6865, b 7, soluble in water, alcohol, or ether Used as a bait for boll weevils **d aminoazobenzene** $C_{14}H_{15}N_3$ = 225 13 Butter yellow Yellow scales, soluble in water, acids, or oils Used as indicator in the analysis of gastric lactic acid, also as a coloring matter for oils (Acids—rose-red alkalis—yellow) **d aminoazobenzenesulfonic acid** Sulfobenzene azodimethylaniline **d aminobenzal rhodanine** $C_{12}H_{12}$-NOS_2 A colorimetric reagent for copper, mercury and silver **d aminobenzene** Dimethylaniline **d aniline** $C_8H_{11}N$ = 121 14 Ph NMe_2 A yellow or brown, oily liquid, $d_{20°}$ 0 958, m 2 5, b 193 3, soluble in water, alcohol, or ether Used in organic synthesis, as reagent for nitrates, and in the manufacture of dyes (methyl violet) **d anilinesulfonic acid** $C_8H_{11}O_3NS$ = 201 22 **2-,** or ortho-Yellow masses, m 229, soluble in alcohol **4-** or para- Brownish scales, m 257, insoluble in water, soluble in alcohol or ether Used in organic synthesis **d anthracene** $C_{16}H_{14}$ = 206 12 **(alpha-)** or 1 4- Colorless scales, m 225, insoluble in water, soluble in alcohol or

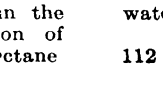
ether **(beta-)** or 1 3- Colorless leaflets, m 204, insoluble in water, soluble in alcohol or ether **2 3-** m 246 **2 4-** m 71 **2 6-** m 231 **d arsenic acid** Cacodylic acid **d arsine** C_2H_7As = 106 07 Me_2AsH A colorless liquid, $d_{29°}$ 1 213, b 36, miscible with alcohol, ether, or chloroform **d benzene** Xylene **d benzoic acids** $C_6H_3Me_2COOH$ = 150 13 Xylic acids **d beryllium** $BeMe_2$ = 39 07 White needles, subliming at 200, decomp by water to CH_4 **d cadmium** $CdMe_2$ = 142 46 An oily liquid, d 1 985, m −4 5, b 106 **d carbinol** Isopropylalcohol **d carbonate** Methyl carbonate **d cyclooctadiene** See *cyclooctadiene* **d diamidotoluphenazine** Neutral red **d diethyl tin** Me_2SnEt_2 = 206 82 A colorless liquid, d 1 232, m −13, b 145, soluble in alcohol or benzene **d ether** Methyl ether **d ethylamine** $C_4H_{11}N$ = 73 1 Ethyldimethylamine The tertiary amine $EtNMe_2$ **d ethylcarbinol** Tert isoamylalcohol **d ethylmethane** Isopentane **d ethylene** Butylene **d glyoxime** $C_4H_8O_2N_2$ = 116 10 Diacetyl-dioxime White needles or crystalline powder, m 234, insoluble in water, soluble in alcohol or ether Used as a reagent in the detection, separation, and determination of nickel or palladium **d hexane** Octane **d hydantoin** $C_5H_8N_2O_2$ = 128 1



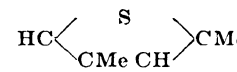
A white, odourless solid m 178 (sublimes) Very soluble in water, alcohol or ether Used as a plasticiser for resins **d hydrazine** See *hydrazine* **d hydrazone** See *hydrazone* **d hydroxy benzene sulphonphthalein** Xylenol blue **d ketone** Acetone **d mercury** $HgMe_2$ = 230 66 A colorless liquid, d 3 069, b 94 **d nitrosamine** $C_2H_6ON_2$ = 74 11 Nitrosodimethylin A yellow, oily liquid, b 153, insoluble in water, soluble in alcohol or ether **d naphthalene** See *naphthalene* **d octane** $C_{10}H_{22}$ = 142 17 A group of isomeric liquid hydrocarbons of the methane series, *e g* ,

2 6-	d 0 734	b 159
2 7-	d 0 722 m −53	b 160
l-**3 6-**		b 162
d-**3 6-**	d 0 735	b 160

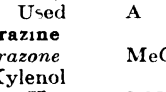
d oxalate $C_4H_6O_4$ = 118 07 Colorless, monoclinic prisms, m 54, b 163 3 **d oxamide** $C_4H_8O_2N_2$ = 116 16 **(asymmetric-)** $NH_2OC\text{-}CONMe_2$ Oxalmethylin Colorless leaflets m 104, soluble in alcohol, ether, or water **(symmetric-)** MeNH OC CO NHMe Colorless needles, m 209, slightly soluble in water, soluble in alcohol or ether **d oxyquinizine** Antipyrine **d phosphine** C_2H_7P = 62 07 Me_2PH A colorless liquid, b 25, insoluble in water **d phosphinic acid** $C_2H_7O_2P$ or $(CH_3)_2PO\,OH$ = 94 07 Colorless crystals, m 76, soluble in water, alcohol, or ether **d phosphoric acid** $C_2H_7O_4P$ = 126 07 $(MeO)_2PO(OH)$ **d phenylenediamine** $C_8H_{12}N_2$ = 136 2 Aminodimethylaniline, dimethylaminoaniline, $NH_2C_6H_4NMe_2$ **o-** b 218 **m-** b 270 **p-** Brown, crystalline masses, m 41, b 262, insoluble in water, soluble in alcohol, ether, or chloroform, used as a reagent for cellulose and fibers, and in organic synthesis **d phenylenediamine hydrochloride** $C_8H_{12}N_2\,HCl$ = 172 6 **para-** Hygroscopic crystals, soluble in alcohol **d phenylenediamine sulfate** $C_8H_{12}N_2\,H_2SO_4$ = 234 29 **para-** Colorless or brownish crystals, soluble in water **d phenol** Xylenol **d piperazintartrate** Lycetol **d propylcarbinol** Hexyl alcohol (4) **d propylmethane** 2-Methylpentane **d pyrazine** Ketine **d pyrazole** $C_5H_8N_2$ = 96 1 A precipitant for cobalt **d pyridine** Lutidine **d pyrrole** C_6H_9N = 95 07 A colorless, oily liquid, $d_{19°}$ 0 935, b 165, slightly soluble in water, soluble in alcohol or ether **d silicane** SiH_2Me_2 = 60 12 A colorless gas, $d_{(-80°C)}$ 0 68, m −150, b −20 1 **d sulfate** $C_2H_6O_4S$ or $(CH_3O)_2SO_2$ = 126 12 A colorless liquid, b 188 5, soluble in water, alcohol, or ether Used as a reagent for detecting coal tar oils and as methylating agent in organic synthesis **d sulfine** The bivalent C_2H_6S— radical **d sulfinic acid** C_2H_6SO = 78 1 Me_2SO **d sulfone** $C_2H_6SO_2$ = 94 1 Me_2SO_2 **d sulfourea** $C_3H_8N_2S$ = 104 2 MeNH CS NHMe **d thetine** $C_5H_{12}O_2S$ = 120 07 Colorless crystals, decomp on heating, soluble in water or alcohol **d thiophen** C_6H_8S =



112 12 **2 3-** A colorless liquid, d 0 9938, b 136 **2 4-**

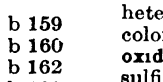


A colorless liquid, d 0 9956, b 138 **2 5-**

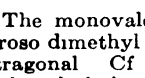


A colorless liquid d-0 986 b 135, insoluble in water, soluble in alcohol or ether **d urea** See *urea* **d yellow** Dimethyl aminoazo benzene **d xanthine** Theobromine

dimethylene (1) Ethylene (2) A prefix indicating the presence of two methylene radicals **d diamine** Ethylene diamine **d imine** C_2H_5N = 43 1 Ethyleneimine, vinylimine The heterocyclic compound



A colorless liquid b 55, insoluble in water **d oxide** Ethylene oxide **d sulfide** Ethylene sulfide **d trisulfide** Ethylene sulfide **d trisulfide** $C_2H_4S_3$ = 124 1 The heterocyclic compound



dimethyline The monovalent radical, —NMe_2 **nitroso-** Nitroso dimethyl amine

dimetric Tetragonal Cf *crystal systems*

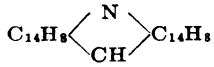
dimine Cyclohexylethylamine dithiocarbamate, m 93, decomp 100 Used as a catalyst in the vulcanisation of rubber

diminution (1) Proposed term for reduction Cf *augmentation* (2) A lessening or decrease

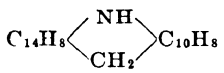
dimorphic Occurring in two crystalline forms having different melting points

dimorphism The property of certain substances of occurring in two different crystalline forms, Cf *polymorphism*

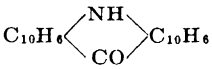
dinaphthacridine $C_{29}H_{17}N$ = 379 2 The heterocyclic compound



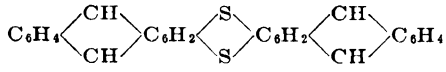
6 isomers $\alpha\alpha'$-; $\alpha\beta'$-, $\alpha\gamma'$-, $\beta\beta'$-, $\beta\gamma'$-, and $\gamma\gamma'$- Cf *dibenzacridine* **dihydro-** $C_{29}H_{19}N$ = 381 2 The heterocyclic compound



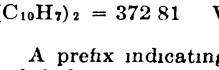
dinaphthacridone $C_{21}H_{13}ON$ = 295 1 The heterocyclic compound



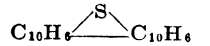
dinaphthanthracene Dibenzanthracene
dinaphthazine Dibenzophenazine
dinaphtho- A prefix indicating two $C_{10}H_6$= groups Cf *naphthalene*
dinaphthofluorene Dibenzofluorene
dinaphthol $C_{20}H_{14}O_2$ = 286 22 HO $C_{10}H_6$ $C_{10}H_6OH$ **alpha-** Colorless rhombic crystals, m 300, insoluble in water, soluble in alcohol or ether **beta-** White needles, m 218, insoluble in water, soluble in alcohol or ether
dinaphthothianthrene $C_{28}H_{16}S_2$ = 416 2 The heretocyclic compound



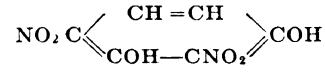
dinaphthoxanthene $C_{21}H_{14}O$ = 282 1 Colorless crystals, m 199
dinaphthyl (1) Binaphthyl (2) A prefix indicating the presence of two naphthyl radicals, $C_{10}H_7$—
d mercury $Hg(C_{10}H_7)_2$ = 329 68 Rhombic crystals, d 1 929, m 243, insoluble in water **d methane** $C_{21}H_{16}$ = 268 2 $C_{10}H_7CH_2C_{10}H_7$ **alpha-** Colorless prisms, m 109, b 360, soluble in hot alcohol, ether, or benzene **beta-** Small needles m 92, soluble in alcohol or benzene **d sulfone** $C_{20}H_{12}O_2S$ = 316 2 The heterocyclic compound



d tin $Sn(C_{10}H_7)_2$ = 372 81 White powder, m 200
dinaphthylene A prefix indicating the presence of two naphthylene groups, $C_{10}H_6$= **d methane** See *picene* and *fluorene* **d thiophen** $C_{20}H_{12}S$ = 284 1



Colorless crystals, m 147
dindyl Diindyl
dineric Having two liquid layers (phases) Cf *dimer*
Dingler, Emil Maximilian 1806–1874 A German technical chemist and editor **D, Johann Gottfried** 1778–1855 A German apothecary and founder of "*Polytechnischen Journal*" (1820)
dinicotinic acid $C_7H_5O_4N$ = 167 1 2 4- or *3 5*-pyridinedicarboxylic acid* Colorless crystals, m 314
dinitramidobenzoic acid **ortho-** Chrysalicic acid **para-** Chrysanisic acid
dinitraniline Dinitroaniline
dinitro- A prefix indicating the presence of two nitro groups **d amidobenzene** Dinitraniline **d aniline** Dinitroaniline **d anthraquinone** $C_{14}H_6O_6N_2$ = 298 07 (**alpha-**) Yellow, monoclinic, microcrystalline powder, m 356, slightly soluble in water, alcohol or ether (**beta-**) Yellow needles, m 280 sparingly soluble in water, alcohol or ether, soluble in glacial acetic acid **d benzaldehyde** $C_7H_4O_5N_2$ = 196 08 **2 4-** Yellow prisms m 72 b 190, slightly soluble in water, soluble in alcohol or ether **d benzene** See *benzene* **d benzoic acid** See *benzoic acid* **d chlorobenzene** $C_6H_3O_4N_2Cl$ = 202 55 **1 2 3-** Colorless needles, m 38 8, soluble in alcohol or ether **1 2 4-** Colorless, monoclinic crystals, m 37, soluble in alcohol **1 3 2-** Colorless crystals, $d_{16°}$ 1 687, m 42, b 315, slightly soluble in alcohol, soluble in ether **1 3 4-** Colorless crystals, $d_{22°}$ 1 697, m 50, b 315, soluble in alcohol **1 3 5-** Colorless needles, m 59, soluble in alcohol or ether, a reagent for mercaptans **d cresol** $C_7H_6O_5N_2$ = 198 2 An orange colored and poisonous coaltar dye, commercially known as "saffron substitute," m 104, b *312*, (decomp) **d glycerin, d glycerol** $C_3H_6(NO_2)_2$ = 182 06 Glycerol-1 3-dinitrate An oily liquid, d 1 47, m −30, b_{15mm}148, used as a high explosive **d naphthalene** $C_{10}H_6O_4N_2$ = 218 2 Yellow crystals, m 153, insoluble in water, soluble in alcohol, ether, chloroform, or benzene *α-* is 1 5-, *β-* is 1 8-, *γ-* is 1 3- **1 2-** m 103 **1 3-** m 145 **1 4-** m 129 **1 5-** m 216 **1 6-** m 162 **1 7-** m 156 **1 8-** m 170, used in dyestuff manufacture **d naphthol** $C_{10}H_6O_5N_2$ = 234 06 A group of intermediates in organic synthesis **2 4-***α-* m 138 **4 5-***α-* decomp 230 **4 8-***α-* decomp *235* **1 6-***β-* m 195 **1 8-***β-* m 198 **d phenamic acid** Picramic acid **d phenol** $C_6H_4O_5N_2$ = 184 14 Hydroxy-dinitrobenzene *α-* is 2 4-, *β* is 2 6-, *γ-* is 2 5-, *δ-* is 3 4-, *ε-* is 2 3-, *ξ-* is 3 5- **2 3-** Yellow needles, m 144, slightly soluble in alcohol, soluble in ether, used as a pH indicator **2 4-** Yellow scales, $d_{24°}$ 1 683, m 114, slightly soluble in water, soluble in alcohol or ether It was used as defatter, but is very poisonous and increases body metabolism and body temperature **2 6-** Yellow needles, m 61 8, slightly soluble in water or alcohol, soluble in ether **3 4-** Colorless needles, m 134 **3 5-** Colorless leaflets, m 122 **2 5- or 3 6-** Colorless leaflets, m 104 **d phenylhydrazine** $(NO_2)_2C_6H_3NHNH_2$ = 198 08 Reddish needles, d 1 868, m 197, explode on further heating, used as reagent for aldehydes and malic acid **d resorcinol** $C_6H_4O_6N_2$ = 200 10 **2 4 1 3-** The nitrated phenol



Yellow scales, m 142, soluble in hot water, alcohol, or chloroform (**crude**) Solid green, dark green, chlorin, diquinoyldioxime A grayish-brown soft mass, sparingly soluble in water, soluble in dilute alkalis or alcohol Used as a green pigment in calico printing, and in dyeing textiles which must be pretreated with iron salts **d salicylic acid** $C_6H_2(OH)(NO_2)_2COOH$ A reagent for glucose **d toluene** $C_7H_6O_4N_2$ = 182 17 *α-* or *meta-* is 2 4-, *β-* or *para-* is 2 5-, *γ-* or *ortho-* is 3 4- **2 4-** Colorless

needles, d_0° 1 321, m 70 7, slightly soluble in water, soluble in alcohol or ether **2 3-** m 63 **2 5-** Colorless needles, m 48, soluble in alcohol, ether, benzene or carbon disulfide **2 6-** Colorless needles, m 66, soluble in alcohol **3 4-** Colorless needles, d 1 32, m 59, insoluble in water, soluble in alcohol, ether or carbon disulfide **3 5-** Colorless needles, m 92, sparingly soluble in water, soluble in alcohol or ether **d xylene** $C_8H_8O_4N_2$ = 196 18 **2 4 1 3-** Long colorless prisms, m 93, soluble in hot alcohol **2 3 1 4-** Colorless, small needles, m 123 6, sparingly soluble in alcohol **2 5 1 4-** Colorless, hexagonal crystals, m 93, soluble in alcohol

dinitroaniline $C_6H_5O_4N_3$ = 183 19 Dinitraniline, $C_6H_3NH_2(NO_2)_2$ **2 3-** m 127 **2 4-** Yellow, monoclinic crystals, d 1 165, m 181, insoluble in water, soluble in alcohol or ether **2 5-** m 137 **2 6-** Large yellow needles, m 138 soluble in alcohol **3 4-** m 154 **3 5-** m 159 **d fluosilicate** $(C_6H_4NH_2NO_2)_2SiF_6$ = 420 2 Rhombic crystals, m 200

dinitroso- A prefix indicating the presence of two —NO groups, as, **d resorcinol,** used as a reagent for iron

dinucleotide A compound formed from two purine bases, as, adenine-uracil

dioctyl (1) Hexadecane (2) A prefix indicating the presence of two octyl radicals **d acetic acid** Isostearic acid

dioform $C_2H_2Cl_2$ = 96 93 Acetylene dichloride CHCl=CHCl A colorless liquid of chloroform-like odor, d 1 29, b 55 It is a mixture of **cis-** d 1 265, m −50, b 48, and **trans-** d 1 291, m −80 5, b 60 3

-dioic A suffix indicating two —COOH groups

diol Glycol An organic compound with two hydroxyl groups Cf *glycols*

diolefine Diene series An unsaturated aliphatic hydrocarbon with the general formula C_nH_{2n-2} and two double bonds, *e g* ,

allene (propadiene)	C_3H_4
divinyl (1 3-butadiene)	C_4H_6
piperylene (1 4 pentadiene)	C_5H_8
isoprene (2-methyl-1 3-butadiene)	C_5H_8
diallyl (1 5-hexadiene)	C_6H_{10}
conylene (1 4-octadiene)	C_8H_{14}

diolein $C_{57}H_{72}O_6$ = 596 5 Glycerol dioleate The dioleic ester of glycerol, formed from triolein by the action of lipase

diondiacids A group of organic acids containing two keto and two carboxyl groups, *e g* , hexan-3 4-diondiacid HOOC CH_2 CO $COCH_2$ COOH (*ketipic acid*), decan-4 7-diondiacid, HOOC - CH_2 CH_2 CO CH_2CH_2 CO CH_2 CH_2 COOH (*dilevulinic acid*)

-dione A suffix indicating the presence of two keto-groups, > CO as, butadione

dionine $C_{19}H_{23}O_3N$ HCl = 349 66 Ethylmorphine hydrochloride A colorless, crystalline powder, soluble in water or alcohol, used medicinally as a substitute for morphine and codeine Cf *codethyline*

diopside $CaMgSi_2O_6$ A monoclinic, white, yellowish, or greenish, rock-forming pyroxene containing chromium, d 3 2, hardness 5–6 Cf *barkalite*

dioptase CuH_2SiO_4 A greenish, hexagonal, hydrous copper silicate, d 3 3, hardness 5, soluble in sulfuric acid

diopter The unit of "power" of a lens The number of diopters is the reciprocal of the focal length in meters

dioptra An optical device for measuring heights and angles

dioptrics A branch of optics dealing with the refraction of light

diorite An igneous rock containing quartz plagioclase, and small amounts of femic minerals, as, camptonide, corsite, auvergnose, daeite and malchite

diorsellinic acid Lecanoric acid

dioscin $C_{24}H_{33}O_9$ $3H_2O$ = 524 4 A saponin from the roots of *Dioscorea japonica*, a Dioscoraceae White, silky needles, m 248, insoluble in water or ether, slightly soluble in hot water, soluble in alcohol or sulfuric acid

dioscorea Yam root A genus of tropical shrubs with edible tubers (yams) The rhizome of *Dioscorea villosa* (wild yam) is used as an antispasmodic and diaphoretic **d sapotoxin.** $C_{23}H_{28}O_{10}$ = 464 3 A toxic principle from *Dioscorea* species

Dioscorides A Greek philosopher of Anazarba, Asia Minor, who made mercury from cinnabar (A D 50)

dioscorine $C_{13}H_{19}O_2N$ = 221 2 An alkaloid from the rhizome of *Dioscorea hirsuta*, a Dioscoreaceae of Java

dioscoroid The combined principles from the root of *Dioscorea villosa* (wild yam) The fluid extract is an antispasmodic

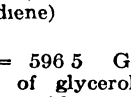
diose A monosaccharide containing two carbon atoms (see *carbohydrates*) Cf *biose*

diosmeleoptene $C_{10}H_{18}O$ = 154 2 A terpene of peppermint-like odor, an isomer of borneol obtained from the essential oil of the leaves of *Diosma* (or *Barosma*) *betulina* Cf *buchu*

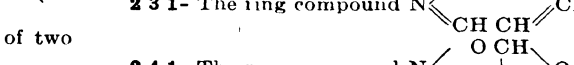
diosphenol $C_{10}H_{16}O_2$ = 168 Buchu camphor, 2-hydroxy-Δ^1-3-p-menthenone A crystalline camphor from the essential oil of *Diosma betulina*

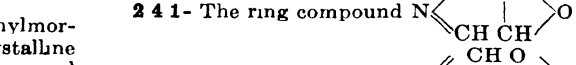
diothane $C_{27}H_{27}O_4N_3$ = 397 3 Piperidinopropanediol diphenylurethane Colorless needles, m 195–200, soluble in hot water, used as local anesthetic

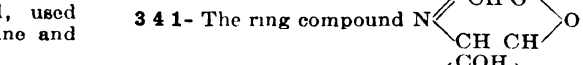
dioxadiene p-Dioxin

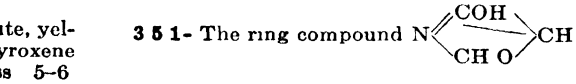
dioxan $C_4H_8O_2$ = 88 06 Diethylene dioxide, dihydro-*p*-dioxin,  A colorless liquid, d 1 038, m 11, b 101, soluble in water A solvent for cellulose esters, used in the silk and varnish industries and as dehydrating agent in histology Cf *dithane*

dioxazine $C_3H_3O_2N$ = 85 1

2 3 1- The ring compound 

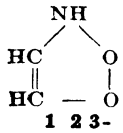
2 4 1- The ring compound 

3 4 1- The ring compound 

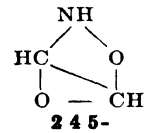
3 5 1- The ring compound 

Cf *dithiazine*

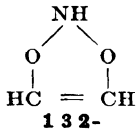
dioxazole $C_2H_3O_2N$ = 73 1 A group of heterocyclic compounds with one nitrogen and two oxygen atoms, as



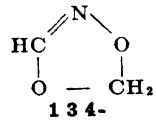
1 2 3-



2 4 5-



1 3 2-



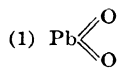
1 3 4-

Cf *dithiazole*

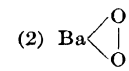
dioxdiazine $C_2H_2O_2N_2$ = 86 1 A group of heterocyclic hydrocarbons with two nitrogen and two oxygen atoms in the hexatomic ring Possible isomers **1 2 3 4- 1 2 3 5- 1 2 3 6- 1 2 4 5- 1 3 2 4- 1 3 2 5- 1 3 4 5- 1 3 4 6- 1 4 2 3- 1.4.2 5- 1 4 2 6-** The first two numbers indicate the position of the oxygen, the last two that of the N atoms

dioxdiazole $CH_2O_2N_2$ = 74 1 A group of heterocyclic hydrocarbons with two nitrogen and two oxygen atoms in the pentatomic ring Isomers **1 2 3 4- 1 2 3 5- 1 3 2 4- 1 3 4 5-** The oxygen atoms occupy the positions indicated by the first two numbers Cf *dithiodiazole*

dioxide A compound containing two atoms of oxygen, viz (1) Normal or true dioxides in which the valency of oxygen is two, as *e g*, in manganese dioxide (2) Abnormal dioxides or peroxides, such as barium dioxide (peroxide), hydrogen dioxide (peroxide) etc The true dioxides only give oxygen with concentrated acids, and chlorine with concentrated hydrochloric acid Peroxides only give hydrogen peroxide The oxygen atoms are linked thus

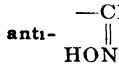


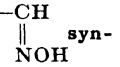
(dioxide)



(peroxide)

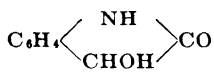
dioxime The monovalent —HC NOH radical occurring in two isomeric forms





dioximes A group of compounds containing two dioxime radicals **alpha-** Glyoximes **beta-** Glyoxime peroxides **gamma-** Compounds in which the two oxime radicals are separated by the ethylene radical, *e g*, succinaldehydedioxime, HON CHCH$_2$ CH$_2$ CH NOH

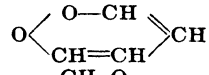
dioxindole $C_8H_7O_2N$ = 149 08 o-Aminomandelic acid lactame,

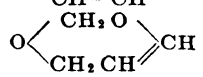


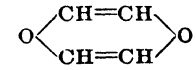
Colorless, rhombic prisms, m 180, decomp 195°, soluble in water, alcohol or ether

dioxine $C_{10}H_7O_2N$ = 173 1 Betaoxynaphthoquinoxime A yellow aniline dye

dioxins $C_4H_8O_2$ = 86 1 and $C_4H_4O_2$ = 84 1 A group of heterocyclic hydrocarbons

o- or 1 2- 

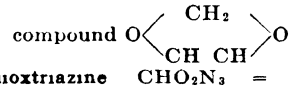
m- or 1 3- 

p- or 1 4- 

dihydro-p- Dioxan

dioxogen A brand of hydrogen peroxide

dioxolan(e)s $C_3H_6O_2$ = 74 04 A group of heterocyclic compounds of 3 carbon atoms and 2 oxygen atoms Many derivatives of the 1 3-isomer are known

dioxole $C_3H_4O_2$ = 72 04 The heterocyclic compound 

dioxtriazine CHO_2N_3 = 87 1 A group of aromatic hydrocarbons which contain three nitrogen-atoms and two oxygen atoms in the hexatomic ring Isomers **1 2 3 4 5- 1 2 3 4 6- 1 3 4 5 6- 1 3 2 4 5- 1 3 2 4 6- 1 4 2 3 5-** The nitrogen atoms occupy the positions indicated by the last three numbers

dioxy- (1) A prefix indicating two additional oxygen atoms in an organic compound (2) Incorrectly used for dihydroxy **d anthracene** See *chrysazol, rufol* etc **d anthranol** Anthrarobin **d benzene** See *catechol resorcinol, quinol* **d ethylene** Dioxan **d phthalaldehydic acid** Noropiamic acid **d quinoline** See *quinoline* **d tetrazotic acid** $CH_2O_2N_4$ A structural arrangement, which is known only in combination **d xanthone** 1 7-Euxanthone

dipalmitate A compound containing two palmitic acid radicals

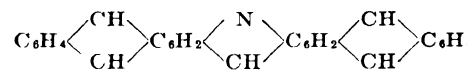
dipalmitin $C_{33}H_{68}O_5$ = 568 5 Glycerol dipalmitate A dipalmitic acid ester of glycerin formed from tripalmitin by the action of lipase

dipentene Terpene **d glycol** Terpine

dipeptide A peptide (q v) or compound of the type NH$_2$RCO NH R COOH, as, anserine

diphenamic acid $C_{14}H_{11}O_3N$ = 241 09 Phenylphthalamic acid, carbamylphenylbenzoic acid Ph C$_6$H$_3$(CONH$_2$) COOH

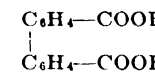
diphenanthracridine $C_{29}H_{17}N$ = 379 2 The heterocyclic compound



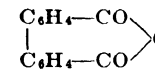
diphenate (1) A salt of diphenic acid (2) Diphenylate

diphenazyl Dibenzoylethane

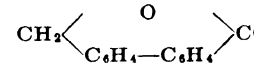
diphenic acid $C_{14}H_{10}O_4$ = 242 09 Bibenzoic acid, o^2-biphenyldicarboxylic acid



Colorless crystals, m 229, soluble in hot water, alcohol or ether **d anhydride** $C_{14}H_8O_3$ = 224 09 Colorless crystals, m 213



diphenide $C_{14}H_{10}O_2$ = 210 1

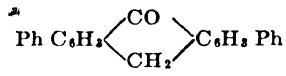


diphenimide $C_{14}H_9O_2N$ = 223 1 Colorless crystals, m 219

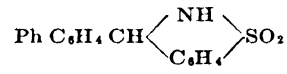
diphenol A diatomic phenol, q v

diphenoquinone $C_{12}H_8O_2$ = 184 1 Bibenzenone O C_6H_4 C_6H_4 O

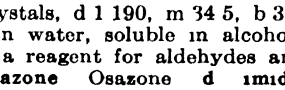
diphenyl (1) Biphenyl (2) A prefix indicating the presence of two phenyl radicals **d acetic acid** , $C_{14}H_{12}O_2$ = 212 17 Colorless needles, m 148 soluble in hot water, alcohol, or ether **d acetonitrile** $C_{14}H_{11}N$ = 193 2 Colorless crystals, m 72, b_{12mm} 184 **d acetylene** Tolane **d amine** See *diphenylamine** **d aniline** Triphenylamine **d anthrone** $C_{26}H_{16}O$ = 346 2 The cyclic ketone



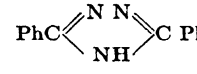
Colorless crystals, m 192 **d benzene** See *benzene* **d benzidine** $C_{24}H_{20}N_2$ = 336 14 A very sensitive reagent for nitrates, zinc, etc **d benzylsultam** $C_{19}H_{15}O$ NS = 321 2



Colorless crystals, m 210 **d carbazide** $C_{13}H_{14}N_2O$ = 214 08 Phenyl hydrazine urea, diphenyl carbohydrazide, $CO(NH\ NHPh)_2$ A white powder, m 170, used as an indicator (alkalis pink, acids white), and reagent for cadmium (blue-violet), chromium (red) and mercury (blue) **d carbinol** Benzohydrol **d chlorarsine** Blue-cross **d cyanarsine** Ph_2AsCN = 255 0 D C Colorless prisms, d 1 45, m 32, with a slight odor of bitter almonds A nose-irritant war poison gas **d diacetylene** $C_{16}H_{10}$ = 202 08 Diacetenyl benzene The hydrocarbon Ph C C C C Ph Colorless needles, m 88, soluble in alcohol or ether **d dicarboxylic acid** Diphenamic acid **d diethylene** $C_{16}H_{14}$ = 206 1 The hydrocarbon Ph CH CH CH CH Ph Colorless crystals, m 148, b 250 **d diketone** A group of compounds containing two phenyl and two keto groups, *e g* , diphenyldiketohexane Ph CO - $(CH_2)_4$ CO Ph, diphenyldiketooctane Ph CO - $(CH_2)_6$ CO Ph **d dimethylethane** $C_{16}H_{18}$ = 210 2 The hydrocarbon Ph CHMe CHMe Ph Colorless crystals, m 123 **d endoanilodihydrotriazole** Nitron **d ethane** Dibenzyl **d ether** Phenylether **d ethylene** Stilbene **d guanidine** $C_{13}H_{13}N_3$ = 211 2 Melaniline $(PhNH)_2C$ NH White microcrystalline needles, m 147, slightly soluble in water, soluble in alcohol, acids, or chloroform Used as standard in acidimetry **d hydrazine** $C_{12}H_{12}N_2$ = 184 24 PhNH NHPh Yellow triclinic crystals, d 1 190, m 34 5, b 302, slightly soluble in water, soluble in alcohol or ether, used as a reagent for aldehydes and ketones **d hydrazone** Osazone **d imide** Carbazole **d ketone** Benzophenone **d methane** $C_{13}H_{12}$ = 168 17 Methylenediphenyl Ditan Benzylbenzene Ph CH_2 Ph Long, colorless needles, d 1 012, m 26 5, b 261, insoluble in water, soluble in alcohol or ether, used in organic synthesis **d nitrogen** $C_{12}H_{10}N$ = 182 09 The free radical (q v) Ph_2N 4 5-**d octan-2 7-dione** $C_{20}H_{22}O_2$ = 294 2 The ketone, MeCO CH_2 CHPh CHPh CH_2 COMe Colorless crystals, m 161, b 335 **d oxide** Phenylether **d pentadienone,** Styryl ketone **d phosphine** Ph_2PH **d sulfide** Phenylsulfide **d tetraketone** $C_{16}H_{10}O_4$ = 266 1 The ketone Ph CO CO CO CO Ph Colorless crystals, m 87 **d. tetraketoxime** $C_{16}H_{11}O_4N_3$ = 295 2 Diphenyltetraketone-1 4-dioxime Colorless crystals, m 176 **d tetrazine** $C_{14}H_{10}N_4$ = 234 3 The heterocyclic compound

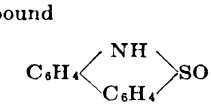


d thiocarbazone Dithizone A reagent for lead with which it produces a compound soluble in certain organic solvents and enables the lead to be separated from other metals **d thiourea** Sulfocarbanilide **d tin** $SnPh_2$ = 272 78 Yellow amorphous powder, m 226, insoluble in water **d triazole** $C_{14}H_{11}N_3$ = 221 3 The heterocyclic compound



d triketone $C_{15}H_{10}O_3$ = 238 1 Dibenzoylketone, PhCO CO COPh Colorless crystals, m 70, b_{175mm} 289 **d urea** Carbanilide

diphenylamine* $C_{12}H_{11}N$ = 169 19 Phenylaniline The secondary amine Ph_2NH, Colorless leaflets, d 1 159, m 54, b 302, sparingly soluble in water, soluble in alcohol, or ether Used as a reagent for nitric acid in water, milk, etc , in organic synthesis, and as an indicator in titrations of iron with dichromate **3-hydroxy-** $C_{12}H_{11}ON$ = 185 10 m- phenylaminophenol Colorless crystals, m 82, b 340, **4-hydroxy-** $C_1H_{11}ON$ = 185 10 p-phenylaminophenol Colorless crystals, m 70, b 330 **seleno-** Phenoselenazine **thio-** Phenothiazine **d sulfoxide** $C_{12}H_9ONS$ = 215 1 The heterocyclic compound

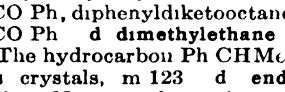


Cf *biphenylamine, xenylamine*

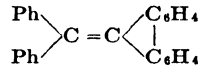
d blue Diphenylbenzidine An oxidation product of d used as an oxidation-reduction indicator **d chlorarsine** NH $(C_6H_4)_2$ AsCl = 277 5 Adamsite, D M Yellow odorless crystals, d 1 65, m 195, insol in water The vapors are a nose-irritant war poison gas

diphenylate A compound containing two phenoxy groups, PhO—

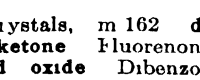
diphenylene (1) The bivalent $C_{12}H_8$=radical,



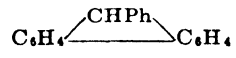
(2) A compound with two $C_6H_4<$ radicals **d acetic acid** Fluorene carboxylic acid **d dimethylene** Dihydroanthracene **d dioxide** Dibenzodioxin **d diphenylethylene** $C_{26}H_{18}$ = 330 2 The hydrocarbon



Yellow crystals, m 229, cf *difluorene* **d ether** Benzofuran **d glycollic acid** $C_{14}H_{10}O_3$ = 226 1 meso-oxyfluorene carboxylic acid



Colorless crystals, m 162 **d imide** Carbazole **d ketone** Fluorenone **d methane** Fluorene **d oxide** Dibenzofurane **(methylene-)** Xanthene **d oxycarbinol** Xanthydrol **d phenylmethane** $C_{19}H_{14}$ = 242 1 Msphenylfluorene The hydrocarbon



Colorless crystals, m 146 **d sulfide** Dibenzothiophen (**methylene-**) Thioxanthene

diphenylenimide Carbazole

diphosgene $C_2Cl_4O_2$ = 198 0 Perstoff, surpalite, trichloromethyl chloroformate, $Cl-COOCCl_3$ A lung-irritant poison gas, d 1 66, m −57, b 128, used in World War I

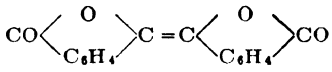
diphosphate (1) A compound containing two phosphoric acid radicals, $\equiv PO_4$ (2) A compound containing the divalent $=HPO_4$ radical, *e g*, sodium diphosphate (Na_2HPO_4), calcium diphosphate $Ca(HPO_4)_2$

diphosphenyl $C_{12}H_{10}P_2$ = 216 2 Ph P P Ph A yellow, crystalline powder

diphosphoric acid Pyrophosphoric acid **anhydro-oxymethylene-** $C_2H_8O_9P_2$ = 238 09 A constituent of green plants (see *phytin*) containing about 26 % phosphorus

diphospho glyceric acid $C_3H_8O_{10}P_2$ = 266 0 $[(HO)_2PO\,O]_2C_2H_3\,COOH$, m 174 It occurs in blood

diphthalyl $C_{16}H_8O_4$ = 264 1 The heterocyclic ketone



Colorless crystals m 234

dipicolinic acid $C_7H_5O_4N$ = 167 1 1 5 or 2 6-pyridinedicarboxylic acid* Colorless needles, m 225, slightly soluble in warm water, alcohol, or ether

dipicrylamine Hexanitro diphenylamine

dipiperidyls Compounds formed by the reduction of pyridine or dipyridyl They are very soluble in water, giving strongly alkaline solutions which absorb carbon dioxide very readily and regenerate it if subsequently heated

diplogen Deuterium

diplomethane Methane-*d*

diplon Deuteron

diplosal $C_{14}H_{10}O_5$ = 258 08 Salicylosalicylic acid, $HO\,C_6H_4COOC_6H_4COOH$ Colorless crystals, m 148, used in medicine

dipole (1) A co-ordinated valence link between two originally neutral atoms, whereby one loses, and the other gains a share of two electrons, (Cf *co-valence*) (2) The electrical symmetry of a molecule, hence a charge of positive electricity very close to an equal negative charge It is measured by the d moment **d moment.** A molecular constant, μ, which indicates the distribution of electrical charges in a neutral molecule It is zero if they are symmetrically distributed, and up to 5×10^{18} e s u , if they are not Cf *Debye equation, association*

Dippel, Johann Konrad 1673–1734 A German alchemist **D 's oil** The distillation-product of bones and other animal matter, chiefly containing pyridine and pyridine bases Used as an antiseptic and for denaturing alcohol

dipping refractometer See *refractometer*

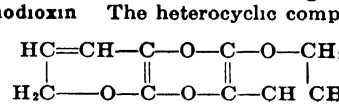
dipropargyl (1) Bipropargyl (2) A prefix indicating the presence of two propargyl radicals

dipropyl- A prefix indicating the presence of two propyl radicals **d amine** $C_6H_{15}N$ = 101 19 The secondary amine $(MeCH_2CH_2)_2NH$ A colorless liquid, $d_{25°}$ 0 736, b 110, soluble in water or alcohol **d beryllium** $Be(C_3H_7)_2$ = 95 1 A colorless liquid, m −17, b 245 **d cadmium** $Cd(C_3H_7)_2$ = 198 52 A colorless liquid, d 1 4201, m −83, b_{21mm} 84 **d carbinol.** $C_7H_{16}O$ = 116 2 Heptane-4-ol, 3-propylbutanol, $(MeCH_2CH_2)_2CHOH$ A colorless liquid, $d_{22°}$ 0 820, b 154, soluble in alcohol or ether **d ether** Propylether **d. ketone** Butyrone **d mercury.** $Hg(C_3H_7)_2$ = 286 73, A colorless liquid, d 2 124, b 190, insoluble in water **d tin** $Sn(C_3H_7)_4$ = 204 8 A colorless liquid **d tin dibromide** $Sn(C_3H_7)_2Br_2$ = 364 64 Yellow crystals, m 54 **d tin dichloride** $(C_3H_7)_2SnCl_2$ = 275 72 White crystals, m 81

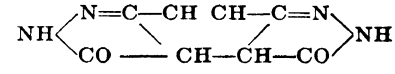
diprotocatechuic acid $C_{14}H_{10}O_7$ = 290 08 Fine needles, m 237, soluble in acetone or alcohol It occurs in tannins Cf *diresorcylic acid*

dipsomania A state of acute craving for alcohol

dipyranodioxin The heterocyclic compound



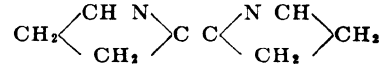
dipyrazolone A compound containing two pyrazolone groups, *e g*, **hexahydrobenzo-** $C_8H_6O_2N_4$ The heterocyclic system



dipyridine $C_{10}H_{10}N_2$ = 158 22 Nicotyrine Colorless needles, m 108, soluble in water, alcohol or ether

dipyridyl $C_{10}H_8N_2$ = 156 21 Bipyridine $C_5NH_4—C_5NH_4$ **beta-** Colorless needles, m 68, b 287, soluble in alcohol or ether **gamma-** Colorless needles, m 73, b 305, sparingly soluble in water, soluble in alcohol or ether

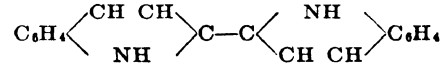
dipyrrole $C_8H_{10}N_2$ = 134 1 The heterocyclic system



furo- See *furodipyrrole*

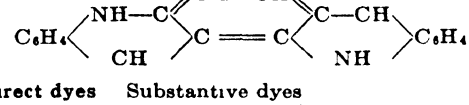
diquinidine Diconchinine An alkaloid from cinchona

diquinoline $C_{18}H_{14}N_2$ = 258 29



Yellow needles, m 114, insoluble in water, soluble in alcohol or ether **alpha-** $C_{18}H_{12}N_2$ = 256 27 Monoclinic scales, m 175, insoluble in water, sparingly soluble in alcohol or ether **beta-** Monoclinic leaflets, m 191, insoluble in water, soluble in alcohol or ether

diquinolopyridine $C_{20}H_{14}N_2$ = 296 3 The heterocyclic ring system



direct dyes Substantive dyes

direct-vision spectroscope. A spectroscope in which a series of prisms is arranged in a tubular container so that the emergent rays follow the direction of the incident rays, the spectrum can thus be viewed directly through a stationary eyepiece

diresorcinol $C_{12}H_{10}O_4,2H_2O$ = 254 17 A white, crystalline powder, or long needles, m 310,

soluble in hot water, alcohol ether or glacial acetic acid

diresorcylic acid $C_{14}H_{10}O_7$ = 290 08 An isomer of digentisic acid $(HO)_2C_6H_2COO-C_6H_3(OH)COOH$ Micro-needles, decomp 215, soluble in hot water It occurs in tannins

disaccharides A group of carbohydrates that yield two simple sugars (monosaccharides) on hydrolysis See *carbohydrates*

disagglomeration The transformation of compact masses into a fine powder by chemical means, *e g* , the treatment of lead with a solution of lead salts

disalicylic acid (1) Salicylic anhydride (2) Diplosal **acetylmethylene-** Urasol

disalicylide $C_{14}H_{10}O_6$ = 274 1 Salosalicylide $C_2H_4(OH)COO\,C_6H_3(OH)COOH$

disassimilation The oxidation of assimilated material, accompanied by the liberation of energy used for work

disassociation The breaking apart or splitting of a molecule into simpler constituents **electrical-** The splitting of molecules into ions, *e g* , ionization **photo-** The disarrangement of molecules under the influence of light, *e g* , silver salts **thermal-** (commonly, *dissociation*) The breaking apart of a molecule into simpler constituents (smaller molecules or atoms) by the action of heat By lowering the temperature, the split-products again unite and form the original molecule Cf , *dissociation*

disazo compound A compound containing two azo groups of the type R N N R N N R Many dyes belong to this group Cf *diazo compounds*

disc A round, plate-like object **alundum-** A porous plate made of alundum, used as a filter

discharge (1) The sudden escape or liberation of stored or accumulated energy, *e g* , of electricity (spark-discharge), or of chemical energy (explosion) (2) Any waste liquid of a manufacturing plant (3) The output of a pump **disruptive-** A crackling, noisy discharge of electrical energy **silent-** A slow, or gradual loss of electrical energy due to the conductivity of air Cf *saturation current*

discol An internal combustion fuel, which contains 50 % of alcohol, 25 % of benzol and 25 % of hydrocarbons

discrasite Dyscrasite

discutient A drug which effects the disappearance of tumors and inflammatory exudations, *e g* , iodine, ichthyol, glycerin

diselenide A compound of the type R Se Se R

disgregation The reverse of aggregation, *e g* , dispersion, separation

dish A shallow or flat vessel made of glass or metal Used extensively in laboratory work **aluminum-** A dish of aluminum used in milk analysis **alundum-** A dish made of alundum used for incinerations **crystallizing-** A shallow glass vessel used for the evaporation and crystallization of solutions **culture-** A shallow vessel with a flat bottom, made of heavy glass, used for growing cultures of bacteria (Petri-dishes) **filtering-** A dish-shaped cone of porous material, used for filtering **incineration-** q v **moisture-** A d with loose fitting cover **weighing-** A flat, covered platinum, aluminum or German silver dish used for weighing

disilane See *silanes* **hexafluoro-** Si_2F_6 = 170 1 A gas, m −18 7

disilicic acid Silicic acid

disiloxane $(SiH_3)_2O$ = 106 95 A colorless, odorless combustible gas, m −144, b −15 2

disinfect To free from infection, especially by destroying disease germs or other harmful microorganisms Cf *sterilize*

disinfectant An agent that frees from infection, usually a substance which destroys microorganisms (bacteria, protozoa, etc) but not bacterial spores, *e g* , sublimate, phenol, cresol, formaldehyde

disinfection A process or method of destroying micro-organisms

disinfest To free from infesting insects, rodents or other small animals

disintegration (1) Decomposition (2) See *atomic d* **artificial-** See *radio elements*

disintoxicate Detoxicate

disk Disc

dismutation The change of one substance into two, as, in Cannizzaro's aldehyde reaction which produces acids and alcohols

disoxidation Deoxidation

dispensary A place where medicines are dispensed, *e g* , an apothecary's shop

dispensatory A book giving detailed information of all substances used as drugs It is more complete than a Pharmacopoeia (q v) Cf *formulary*

dispensing The act of compounding medicines and preparing dosages **d balance** A delicate scale, less sensitive than an analytical balance, used in drug stores **d dose** See *dosage*

dispergator A peptizing agent Cf *peptizator*

dispersed Finely divided Colloidal **d phase** Colloidal matter Cf *colloids* **d system** An apparently homogeneous substance which consists of a microscopically heterogeneous mixture of two or more finely-divided phases (solid, liquid, or gaseous), *e g* , liquid and liquid (milk), solid and gas (smoke), liquid and gas (fog) See *colloids, orientation, zone*

dispersimeter A device for measuring the average grain of optically heterogeneous media, *e g* , the uniformity of a tri-color screen or autochrome plate

dispersion Scattering (1) The degree of dispersion of a substance depends on the size of the finely-divided particles, which may be microscopic (microns), ultramicroscopic (submicrons), or subultramicroscopic (amicrons) (2) The separation by refraction of the constituent rays of a beam of non-homogeneous light, *i e* , the angle between the extreme rays of the spectrum produced **coefficient of-** The constant B in the formula $\mu - 1 = A(1 + B/\lambda^2)$, where μ is the refractive index for the wavelength λ, and A a constant B is used for the identification of oils etc **d medium** The material surrounding dispersed matter

dispersivity The difference between the refractivities of a substance for rays of different wavelengths **specific-** The ratio

$$r_a - r_b = \frac{n_a^2 - 1}{(n_b^2 + 2)d} - \frac{n_b^2 - 1}{(n_b^2 + 2)d},$$

r_a and r_b are the specific refractivities, and n_a and n_b are the refractive indices for the rays of wave-lengths a and b, respectively, and d is the density of the substance

dispersoid A colloidal or finely-divided substance

displacement (1) A chemical change in which one element, molecule or radical is removed by another element, molecule or radical (2) An

ionic change in which one element exchanges charges with another element either by oxidation or reduction **electron-** Displacement (2) **d law** The first enhanced spark-spectrum of an element has a structure similar to that of the element preceding it in the Periodic Table **d reaction** The general equation for displacement of metals is M + YX = MX + Y, the metal M being more positive than the metal Y, hence, M is oxidized The general displacement equation of non-metals is N + YX = YN + X, the nonmetal N being more electronegative than the non-metal X, hence N is reduced **d series** Electromotive series, Volta series, constant series Arrangement of the elements in order of their relative potentials At the top of the list are the most negative elements, which displace all anions following, and are thus reduced At the end of the list are the most positive elements which displace all preceding cations and thus become oxidized

DISPLACEMENT SERIES

Negative	
fluorine	HYDROGEN
CHLORINE	
OXYGEN	TIN
NITROGEN	LEAD
BROMINE	germanium
IODINE	zirconium
SULFUR	cerium
selenium	nickel
tellurium	COBALT
PHOSPHORUS	thallium
chromium	columbium
vanadium	cadmium
tungsten	IRON
molybdenum	ZINC
CARBON	manganese
boron	uranium
GOLD	gadolinium
osmium	indium
platinum	gallium
iridium	ALUMINUM
tantalum	rare-earth metals
palladium	beryllium
ruthenium	scandium
ANTIMONY	yttrium
BISMUTH	MAGNESIUM
ARSENIC	lithium
MERCURY	CALCIUM
SILVER	strontium
COPPER	BARIUM
silicon	SODIUM
titanium	POTASSIUM
	rubidium
HYDROGEN	cesium
	Positive

disproportionation The conversion of like into two or more unlike molecules, as, $2C_2H_4 = C_2H_2 + C_2H_6$ Cf *dismutation*

disruption A tearing apart or a sudden outburst, *e g* , a disruptive charge

dissection A cutting to pieces, as, the removal of tissues from an animal or vegetable organism to expose underlying structures

dissemination (1) Dispersion (2) The scattering of seeds by natural causes

dissipation The transformation of mechanical into heat energy, as, the internal friction of solids and liquids **d constant** $Q = E/\omega\mu$, where E is Young's modulus, $\omega = 2\pi f$, and μ is the internal viscosity Q is a measure of the internal friction, values are

Quartz	100,000
aluminum	50,000
brass	40,000
duralumin	30,000
iron	20,000
permalloy	9,000
silver	6,000
copper	3,000
nickel	2,000
zinc	1,900
glass	1,600
graphite	900
tin	800
lead	30

dissociated Split into simpler constituents **electrolytically-** Ionized

dissociation The breaking apart of a molecule by physical means **electrolytic-** Ionization **photo-** See *disassociation* **thermal-** Occurs when a solid, liquid, or gaseous molecule is split into simpler molecules or atoms under the influence of heat and re-unites after the temperature is lowered, as,

$$PCl_5 = PCl_3 + Cl_2$$
$$2NH_4Cl_{(solid)} = NH_3 + HCl + NH_4Cl_{(vapor)}$$

Cf *disassociation*

d constant See law of *mass action* **d pressure** The sum of the partial pressures of dissociated molecules in a system

dissolution (1) Solution (2) Hydrolysis of organic tissues

dissolve To bring a solid into solution, as, water dissolves salt, salt dissolves in water

dissolved In a state of solution **d substance** A solute, q v

dissolvent Solvent

dissonance (1) A discord (2) A combination of sounds which produces beats

dissymmetry Absence of complete symmetry The optically-active substances are not identical with their mirror images, but have axes of symmetry in their molecular configuration Cf *asymmetry*

distance The length between two points Cf *magnitudes*

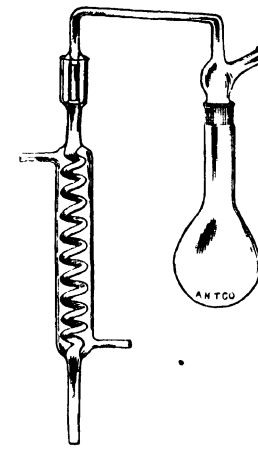
distearin $C_{39}H_{75}O_5$ = 623 7 Glycerol distearate The distearic ester of glycerin, m 74 5

disthene Cyanite

distilland That which is undergoing distillation

distillate A liquid which has been produced by condensation from its vapor

distillation The purification of a liquid by heating it to its boiling point, and condensing and collecting the vapors **cold-** Distillation at low temperatures, *e g* , in a vacuum **con-** See *condistillation* **destructive-** The distillation of complex, organic matter (*e g* , wood) which decomposes into a number of split products **fractional-** Slow distillation of a mixture of substances and separate collection of the distillates at each boiling point, or after definite



Distillation apparatus

temperature intervals **isothermal-** The transference of water in the form of vapor from a weak to a strong solution in an enclosed space, owing to the difference in vapor-pressures **repeated-** Cohobation **steam-** Distillation by the passage of steam through a liquid

d apparatus A device for distillation which generally consists of a closed vessel (retort, flask, kettle) connected with a condenser which leads into a receiver **d flask** A flask of heat-resisting glass having a long neck with tubular outlet **d value** The ratio between the concentration of a steam-volatile substance in the vapor of its boiling solution, to that in the liquid It is constant for a particular substance, and equals $\log(1 - y)/\log(1 - x)$, where x is the volume of the distillate and y the amount of substance it contains Cf *Henry's law*

distilled Describing a liquid which has been vaporized and condensed

distilled water Vaporized and condensed water, used extensively in the laboratory as solvent **double-** Water which has been distilled twice, the last time in a still made entirely of glass or of platinum Used for hypodermic injections

distillery A place where distillation is performed, generally a factory making alcohol from fermented sugars **d waste** The residue from the stills from which alcohol has been distilled, it contains K and is used as a fertilizer

distribution (1) The occurrence of an element or substance on the earth's surface, the materials may be either diffused or localized, abundant or scarce Cf *abundance* (2) The assimilation or spread of a substance or drug in the animal organism **d coefficient** Partition coefficient, Overton coefficient A ratio indicating the diffusibility of a substance into the cell protoplasm, *e g* , if S_f denotes the solubility of a substance in fat, lecithin, phosphatides etc , and S_w its solubility in water, then S_w/S_f is the distribution coefficient which will determine its velocity of diffusion into the cell protoplasm **d law.** If a substance is dissolved in two immiscible liquids, a and b, then the ratio of its concentrations in each (c_a and c_b), will be a constant, $c_a/c_b = K$ Cf *partition, Nernst's law* **d principle** Michael's rule If HX adds on to an olefine linkage, where x is a halogen, x unites with the carbon atom having the lesser number of hydrogens, thus, $CH_3CH - CH_2 + HBr \rightarrow CH_3CHBrCH_3$ Cf *Markownikoff's rule*

distributors A three- or four-way stop-cock or switch

distyrene $C_{16}H_{14}$ = 206 11 The hydrocarbon $(PhCH{:}CH{-})_2$ White crystals, m 124

disulfate (1) A pyrosulfate, $M_2S_2O_7$ (2) A bisulfate, $MHSO_4$

disulfide A compound containing two sulfur atoms as sulfide **alkyl-** A organic compound containing a carbon chain and the bivalent —S S— radical **ethyl-** Et_2S_2 = 122 22 A colorless liquid, b 151 **methyl-** Me_2S_2 = 94 19 A colorless liquid, b 112

disulfo- A prefix indicating the presence of two sulfur atoms, either as sulfide or sulfuric acid **d acid** *1*-Naphthylamine-*4 8*-disulfonic acid **d benzoic acid** See *benzoic acid* **d chloride** Sulfur monochloride **d cyanate** Dithionate **d cyanic acid** Dithionic acid **d metholic acid** Methionic acid **d naphtholic acid** Naphthalene disulfonic acid

disulfole Dithiole

disulfonic acid See *sulfonic acids*

disulfuric acid Pyrosulfuric acid

dita bark Alstonia, Australian fever bark, Australian quinine The bark of *Alstonia scholaris*, an Apocynaceae of Australia, used as a febrifuge It yields ditaine, ditamine, echicerin, echitenine Cf *alstonine*

ditaine $C_{22}H_{28}O_4N_2$ = 384 23 Echitamine An alkaloid from the bark of *Alstonia scholaris* or dita bark Colorless crystals, m 206, soluble in water, alcohol ether or chloroform It is used medicinally like curare **d sulfate** $C_{22}H_{28}O_4N_2\,H_2SO_4$ = 700 48 Colorless needles, soluble in water

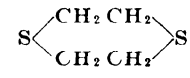
ditamine $C_{16}H_{19}O_2N$ = 257 2 An alkaloid from the bark of *Alstonia scholaris* Colorless crystals, m 75, insoluble in water, soluble in ether, chloroform or acids

ditan Diphenyl methane

diterpenes A group of compounds of general formula $C_{20}H_{32}$ See *terpenes*

dithanol Dioxyanthrarobin

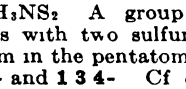
dithiane (1) Diethylene disulfide (2) A group of heterocyclic hydrocarbons with two sulfur atoms in the hexatomic ring, as p- or 1 4-



dithiazine $C_3H_3NS_2$ A group of heterocyclic hydrocarbons with two sulfur atoms and one nitrogen atom in the hexatomic ring, as **1 2 3-, 1 2 4-, 1 3 2-, 1 3 4-, 1 3 5-, 1 4 2-** The first two numbers indicate the positions of the sulfur atoms

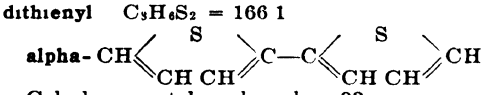
dithiazol $C_2H_3NS_2$ A group of heterocyclic hydrocarbons with two sulfur atoms and one nitrogen atom in the pentatomic ring, as **1 2 3-, 1 2 4-, 1 3 2-** and **1 3 4-** Cf *dithiole*

dithiene $C_4H_4S_2$ = 116 1 A group of heterocyclic hydrocarbons with two sulfur-atoms in the hexatomic ring, as p- or 1 4-



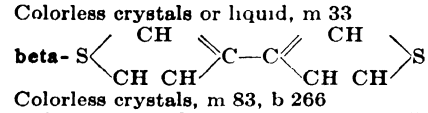
dithienyl $C_8H_6S_2$ = 166 1

alpha-



Colorless crystals or liquid, m 33

beta-



Colorless crystals, m 83, b 266

d ketone $C_8H_6OS_2$ = 194 1 Thienone Colorless crystals, m 88, b 324 **d methane** $C_9H_8S_2$ = 180 1 $(C_4H_3S)_2CH_2$ Colorless crystals, m 43, b 267 **d phenylmethane** $C_{15}H_{12}S_2$ = 257 2 $(C_4H_3S)_2CH\,Ph$ Colorless crystals, m 75

dithiobenzoic acid C_6H_5CSSH = 154 1 An oily liquid

dithiobisalanine Cystine

dithiocarbamic acid $NH_2CS\,SH$ = 93 2 Colorless needles, decomp by water, soluble in alcohol or ether

dithiocarbonic acid CH_2OS_2 = 100 00 The theoretical acid HO CS SH Cf *xanthic acid*

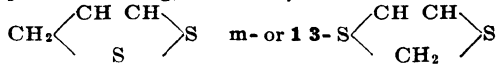
dithiodiazole $CH_2N_2S_2$ A group of heterocyclic hydrocarbons with two sulfur and two nitrogen atoms in the pentatomic ring There are the isomers **1 2 3 4-, 1 2 3 5-, 1 3 2 4-,**

1 3 2 5-, 1 3 4 5- The first two numbers indicate the positions of the sulfur atoms

dithioethidene A compound containing the bivalent —S CH(CH$_3$) S— radical **ethylene-** $C_4H_8S_2$ = 120 1 A colorless liquid, b 173

dithiolcarbonic acid CH_2OS_2 = 100 00 The theoretical acid CO(SH)$_2$

dithiole $C_3H_4S_2$ = 104 0 Disulfole Erroneously called dithiazole A group of heterocyclic hydrocarbons with two sulfur atoms in the pentatomic ring, as **o-** or **1, 2-**



m- or **1 3-**

Cf *dioxole*

dithion A mixture of sodium dithiosalicylates Yellowish-gray powder, soluble in water Used in veterinary medicine

dithionate A salt of the type $M_2S_2O_6$

dithionic acid (1) $H_2S_2O_6$ = 162 1 An acid, HO SO$_2$ SO$_2$ OH, known only in solution and as salts, the hyposulfates (2) The organic acid, R CS SH Cf *thio acid*

dithionite Hyposulfite A salt of the type $M_2S_2O_4$

dithionous acid $H_2S_2O_4$ = 130 1 Hyposulfurous acid An acid, HO SO SO OH, known only in solution and as salts (hyposulfites)

dithiosalicylate Thioform

dithiosalicylic acid See *thioform*

dithiourazole $C_2H_3S_2N_3$ = 133 2 Colorless crystals, m 245 Cf *urazole*

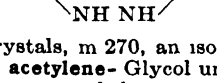
dithiourethane Ethyl dithiocarbamate NH$_2$-CS SEt

dithiozone Dithizone

dithizone $C_{13}H_{12}N_4S$ = 360 09 Diphenylthiocarbazone, phenylazothionoformic acid, dithiozone, PhN N CS NH NHPh Blue-black crystals, soluble in CCl_4 (green color), in alkalis (with red color) and sulfuric acid (blue color) Used as microreagent for lead (brick red), copper (yellow brown) and zinc (purple), also to separate these from other metals

ditolyl $C_{14}H_{14}$ = 182 19 Dimethyldiphenyl Me C_6H_4 C_6H_4 Me **2 2'-**, or o,o- A colorless liquid, b 272, insoluble in water, soluble in alcohol or ether **2 3'-**, or o,m- A colorless liquid, b 228, insoluble in water, soluble in alcohol or ether **3 3'-**, or m,m- A colorless liquid, b 286, insoluble in water **4 4'-**, or p,p- Colorless prisms, m 121, soluble in alcohol or ether **d amine** $C_{14}H_{15}N$ = 197 23 A group of 9 isomers, (MeC$_6$H$_4$)$_2$NH, as, (**ortho-**) A colorless liquid, b 313, sparingly soluble in water (**meta-**) A colorless liquid, b 319, insoluble in water, miscible with alcohol or ether (**para-**) Colorless needles, m 79, b 330, insoluble in water, soluble in alcohol or ether **d tin** Sn(C$_6$H$_4$Me)$_2$ = 300 81 A yellow amorphous powder, m 111, soluble in benzene

diurea $C_2H_4O_2N_4$ = 116 1 Biurea, *p*-urazine, bishydrazicarbonyl,



Colorless crystals, m 270, an isomer of urazine Cf *biuret* **acetylene-** Glycol uril

diureide A compound that contains two —NH-CO NH— radicals

diuretic A drug which increases the kidney or renal excretions and thereby produces an increased discharge of urine, *e g* , caffeine, digitalis, theobromine, acetates, citrates, bitartrates

divalent (1) Describing an element occurring in two states of oxidation, as, mercury (1 and 2) or cobalt (2 and 3) (2) Bivalent

divanadyl The tetravalent $V_2O_2^{++++}$ radical

divaric acid $C_{10}H_{12}O_4$ = 196 09 6-propyl-β-resorcylic acid An acid from the lichen *Evernia divaricata*

divarinol $C_9H_{10}O_2$ = 150 08 Propylresorcinol, C_3H_5 C_6H_3(OH)$_2$ White powder, used as an antiseptic

diversine $C_{20}H_{27}O_5N$ = 361 3 An alkaloid found in the root and stem of *Sinomenium acutum*, a Menispermaceae A yellow, amorphous powder, m 85, insoluble in water alcohol or benzene, soluble in petroleum ether Cf *sinomenine*

divi-divi The pods of *Caesalpinia coriaria*, which are rich in tannin and are used in the tanning and dyeing industry

divinyl (1) Bivinyl (2) A prefix indicating the presence of two vinyl radicals **d acetylene** C_6H_6 = 78 046 *1 5*-Hexadien-*3*-yne* The hydrocarbon CH$_2$ CH C C CH CH$_2$, obtained as oily liquid, d 0785, b 83 5, by passing acetylene into ammoniacal cuprous chloride, it is a basis for synthetic rubber Cf *duprene chloroprene* **d benzene** $C_{10}H_{10}$ = 130 08 The unsaturated aromatic hydrocarbon CH$_2$ CH-C_6H_4 CH CH$_2$ **d ether** C_4H_8O = 72 05 Vinyl ether, ethenoxyethene*, (CH$_2$ CH$_2$)$_2$O A colorless liquid, d 0774, b 28 3, an anesthetic **d ketone** Pentedienone

dixanthylurea The alcohol-insoluble product of xanthydrol and urea [O(C$_6$H$_4$)$_2$CHNH]$_2$CO, used to determine the latter in urine

dixylyl Two xylyl radicals, $C_6H_3Me_2$— **d tin** Sn(C$_6$H$_3$Me$_2$)$_2$ = 328 84 Colorless crystals, m 157

djalmaite A yellow, brown or black radioactive crystalline mineral of Brazil containing 72 % Ta_2O_5 and traces of rare earths

djenkol bean See *jenkolic acid*

djenkolic Jenkolic

djenkolik acid See *jenkolic*

dkg Abbreviation for dekakilogram—10 kg

dkl Abbreviation for dekaliter—10 liters

dkm Abbreviation for dekameter—10 m **dkm^2** Abbreviation for square dekameter —100 m^2 **dkm^3**. Abbreviation for cubic dekameter—1000 m^3

dl Abbreviation for deciliter—0 1 liter

dl- A dextro- *and* levo- compound, *e g* inactive (*i-*) or racemic (*r-*)

d(l)- A dextro- *or* levo-compound

D M Diphenylamine chlorarsine

dm Abbreviation for decimeter—0 1 m **dm^2** An* abbreviation for square decimeter—100 cm^2 **dm^3** Abbreviation for cubic decimeter —1000 cm^3

Dobell solution An aqueous solution of 1 5 % sodium borate, 1 5 % sodium bicarbonate, 0 3 % carbolic acid and glycerin Used as alkaline antiseptic

Döbereiner, Johann Wolfgang 1780–1849 A German chemist, noted for organic syntheses, experiments on the catalytic action of platinum, and the classification of elements **D s match-box or lamp** A portable device for producing a flame by passing hydrogen gas over platinum sponge in contact with air **D 's rule** The atomic weights of similar elements, A, B and C, is approximately 2B = A + C (see *triads*)

Döbner's violet See *violet*

docosane* $C_{22}H_{46}$ = 310 5 The hydrocarbon, $Me(CH_2)_{20}Me$, m 44
docosanoic acid* Behenic acid
docosanol* $C_{22}H_{46}O$ = 326 5 A group of monoatomic alcohols, *e g* 1- or $Me(CH_2)_{20}CH_2OH$
docosoic acid Behenic acid
doctor solution Sodium plumbite solution containing flowers of sulfur **d test** Gasoline is mixed with d solution, and the presence of sulfur is shown by the formation of lead sulfide **d treatment** Petroleum is agitated with sodium plumbite solution and free sulfur
dodecahedron A solid with twelve equal surfaces
dodecanal* Lauricaldehyde
dodecane* $C_{12}H_{26}$ = 170 28 The hydrocarbon $Me(CH_2)_{10}Me$ A colorless liquid, $d_{20°}$ 0 768, m −12, b 214 5, insoluble in water, soluble in alcohol or ether
dodecanic acid Lauric acid **hydroxy-** Sabinic acid
dodecanoic acid* Lauric acid
dodecanol* Dodecyl alcohol
dodecenal* $C_{12}H_{22}O$ = 182 20 Δ^2-dodecene-1-aldehyde, $Me(CH_2)_9CH{=}CHCHO$ An aldehyde in the essential oil from the stems and leaves of *Eryngium foetidum*, an Umbelliferae
dodecene* Dodecylene
dodecoaldehyde Lauric aldehyde
dodecoic acid Lauric acid
dodecyl The monovalent radical $C_{12}H_{25}$— Cf *lauryl* **d alcohol** $C_{12}H_{26}O$ = 186 20 *n*- or *l*-Dodecanol*, $Me(CH_2)_{11}OH$ Colorless crystals, d 0 831, m 24 b 259 **d amine*** $C_{12}H_{27}N$ = 185 22 Aminododecane Colorless crystals, m 28, b $_{15mm}$135
dodecylene $C_{12}H_{24}$ = 168 27 Decylethylene *l*-dodecene*, $CH_2{=}CH(CH_2)_9Me$ A colorless liquid, $d_{20°}$ 0 785 m −31 5, b 213 insoluble in water, soluble in alcohol or ether
dog grass Triticum
dogwood (1) A genus of trees and shrubs (2) Cornus The dried roots of *C florida* of Eastern United States, used as an astringent and tonic Cf *cornuoid* **Alder-** Frangula **Jamaica-** Piscidia **pond-** or **swamp-** See *cephaletin*
dolerite A coarse-grained basalt
dolerophanite Cu_2SO_3 A copper persulfate in volcanic sublimates
Dolezalek electrometer A quadrant electroscope
dolomite $CaMg(CO_3)_2$ An important calcium-magnesium carbonate, which forms mountain ranges as a white, grayish, or yellowish rock, d 2 85-2 95 hardness 3 5-4, soluble in acids See *brown spar*, *bitter spar*, *rhombic spar*
dolomol $Mg(C_{18}H_3O_2)_2$ = 590 8 Magnesium stearate, containing small amounts of the oleate and 7 % MgO A soft white, light unctuous powder, odorless and tasteless, insoluble in water, used as a dusting powder, to substitute zinc stearate
dome A dome-shaped crystal-face, chiefly in the rhombic system **d faces** Prism faces developed parallel to a lateral axis, and intersecting the other two axes *Brachy-* A dome face parallel to the brachy (shorter) axis *Macro-* A dome face parallel to the macro (longer) axis
domesticine $C_{19}H_{19}O_4N$ = 325 15 An alkaloid from the sacred bamboo of Japan, *Nandina domestica*, a Berberidaceae Cf *nandinine*
domeykite Cu_3As A rare copper arsenide
domingite $Pb_3Sb_4S_9$ Warrenite A lead sulfostibate
donarite An explosive-consisting of 70 % ammonium nitrate, 25 % trinitrotoluol and 5 % nitroglycerin
donaxine, Gramine
donor See *induced reactions*
Donnan, F G 1870– An English physical-chemist **D equilibrium** If a nondiffusible substance (*e g*, protein, P) is separated from diffusible substances by a semipermeable membrane, the ions will pass through in different amounts, and establish an electrostatic difference (the membrane potential), hence the osmotic pressure within is greater than that of the outer solution Thus, at equilibrium in, *e g*, *neutral* solution

$$[Na^+] \times [P] \times [Cl^-] = [Na^+] \times [Cl^-]$$

acid solution

$$[Cl^-] \times [Cl^- \text{ on } P] \times [H^+] = [Cl^-] \times [H^+]$$

basic solution

$$[Na^+] \times [Na^+ \text{ on } P] \times [OH^-] = [Na^+] \times [OH^-]$$

dopa $C_9H_{11}NO_4$ = 197 08 *3 4*-Dihydroxyphenylalanine An amino acid and the precursor of melanin
dope (1) A lacquer or varnish, especially for aircraft (2) The absorbent material in high explosives (3) A narcotic
Döppler principle (1842) Wave-type radiations (*e g*, of light or sound) emitted by a moving object decrease and increase in wave-length as the object approaches and recedes from the observer, respectively
dopplerite $C_{12}H_{14}O_6$ Masses of humus imbedded in peat, 56 5 % C, 5 5 % H
Doremus ureometer A graduated glass tube bent at its open end and blown into a bulb, used for determining urea in urine
dormiol $CCl_3CHOHOMe_2Et$ = 233 49 Amylene chloral, ethyldimethyl-carbinolchloral A colorless liquid, d 1 24, insoluble in water, soluble in alcohol, ether, chloroform, or benzene Used as a hypnotic
Dorn-Goetz tube A glass tube, partly evacuated and filled with gas, used for spectroscopic investigations
dorosmic acid $C_{17}H_{34}O_2$ = 270 27 A fatty acid from the oil of *Dorosma nesus* which forms small needles, m 55, soluble in hot alcohol, ether or benzene It is probably identical with margaric acid
dose The quantity of medicine given at one time **daily-** The quantity of drugs administered per day **fatal-** The quantity of medicine to cause death **lethal-** Fatal d **maximum-** The largest amount of medicine which can be given with safety **minimum-** The smallest amount of medicine that will produce a physiological action **poisonous-** Toxic d **safe-** A dose between the minimum and maximum dose **single-** A medicine that is given once only **toxic-** The d which will produce poisonous and harmful effects
dotriacontane* Diacetyl
double bond △ A condition which exists in unsaturated compounds where two single valence bonds connect two atoms, *e g*, $H_2C{=}CH_2$ It is characterized by a readiness to become saturated Cf *unsaturated*
double salt A compound which crystallizes as a single substance but which, on dissolving,

ionizes as two substances, *e g*, $KAl(SO_4)_2 \rightarrow K^+ + Al^{+++} + 2SO_4^{--}$ (Cf *complex salts*)

d weighing A method of obtaining the true weight of a substance independent of irregularities in the length of the balance-arm, by weighing it first on one side of the balance and then on the other

doublet (1) See *multiplet* See *duplet*

douglasite $K_2FeCl_4 2H_2O$ A potassium-iron chloride from Stassfurt, Germany It causes miner's damp, as it reacts with water and forms hydrogen

D O V Distilled oil of vitriol, containing approx 96 % H_2SO_4

Dover's powder A mixture of morphine, emetine, and camphor, used as an anodyne and hypnotic

dowicide-P Trade name for a wood-preserving spray containing sodium tetrachlorophenoxide and sodium dichloro-orthophenyl phenoxide

dowtherm A eutectic mixture of phenyl ether and 26 5 % of diphenyl, m 12, b 258 Used for heating purposes in a manner similar to steam, it enables temperatures to be carefully controlled

dP Abbreviation for difference in pressure

dr Abbreviation for dram—3 88 grams **dr ap** Apothecaries' dram, = ʒ **dr av** Avoirdupois dram **dr fl** Fluid dram

dracaenic acid $C_{12}H_{12}O_3$ = 204 09 An acid from *Dracaena draco*, the dragon-tree of Teneriffe

dracilic, dracylic acid (1) Obsolete term for benzoic acid (2) *p*-Aminobenzoic acid

drachm Dram

dracoalban $C_{20}H_{40}O_4$ = 344 4 A white substance, m 200, from dragon's blood

dracoresin, dracoresene $C_{26}H_{44}O_2$ = 388 34 A yellow, resinous substance from dragon's blood

draconic acid Anisic acid

draconis sanguis Dragon's blood

draconyl $C_{14}H_7$ = 175 1 A hydrocarbon obtained by the distillation of dragon's blood

draconylic acid Anisic acid

dracylic acid See *dracilic acid*

draft gauge A barometer-like instrument for measuring drafts in flues

Dragendorff, Johann Georg Noel 1836– A German pharmacist, analyst and author **D reagent** Suspend 1 5 gm bismuth subnitrate in 20 cc hot water, add 7 gm potassium iodide and 20 drops of dilute hydrochloric acid **D reaction** The sulfates of many alkaloids give an orange-red precipitate with D reagent

dragon's blood Sanguis draconis The resinous exudation from the fruits of rattan palms, a group of climbing Palmae of India, Sumatra, and Borneo Odorless, tasteless masses, insoluble in water, soluble in alcohol or ether giving a red solution Used to color plasters **d gum** Tragacanth

dram Drachm A unit of apothecaries weight, ʒ One dram = 0 16 ounces = 3 scruples = 60 grains = 3 8879351 grams **fluid-** One eighth of a fluid ounce, 60 minims

Draper effect The period of hesitation or photochemical induction observed when a mixture of hydrogen and chlorine is exposed over water to diffused daylight **D law** Absorption law Only rays which are absorbed by a system are effective in producing a chemical change in it

drastic A drug having powerful irritating and purgative action, *e g*, croton oil, elaterin

draught A current of air or gas **d gauge** See *draft gauge* **d tube** A glass tube used in qualitative analysis The substance is placed in it, heated in a current of air and the decomposition products observed

draw-tube A tube sliding within another, as, the portion of the microscope carrying the eyepiece Cf *draught tube*

drierite Anhydrous calcium sulphate used as desiccant

driers (1) Siccatives A group of oxidizing substances which, when added to varnishes, paints, etc hasten the drying, as, solutions of resinates of lead, manganese, zinc, cobalt and/or manganese borate, oleate, dioxide etc (2) A mechanical device for removing moisture from a substance, either by heat air currents or both

drift (1) The uncertain motion of a galvanometer needle when registering a false e m f (*e g*, with a poisoned hydrogen electrode) (2) The passage of an electron from its normal position without complete transference Cf *bonds*

drikold Dry ice

drimin $C_{13}H_{14}O_4$ = 234 1 A crystalline substance, m 256, from the leaves of *Drimys winteri*, a Magnoliaceae of South America Cf *winter's bark*

drimol $C_{28}H_{58}O_2$ = 426 6 A wax from the leaves of *Drimys granatensis*, a Magnoliaceae of South America

drip (1) The amount of liquid which seeps or leaks from a container (2) That portion of liquid which can be expressed from muscle substance

driped Hide steeped in chrome alum, dried, and soaked in melted paraffin wax to render it waterproof

dropping bottle A small glass bottle with pipette and rubber bulb, or with a specially designed glass stopper enabling the contents to be delivered drop by drop **d funnel** A separatory funnel with long stem, and glass stopcock **d pipette** A small glass tube drawn out to a point at one end, with a rubber bulb at the other end

Dropping bottle

drop-reaction Spot test

drops Small round masses of liquid, ordinarily 0 1–0 3 cc **Prince Rupert-** Solidified glass drops with tips, which possess great internal strain and shatter to a fine powder when the tips are broken off

drosera Sundew The air-dried, flowering plant of *Drosera rotundifolia*, or other Droseraceae, used as a mild astringent and a remedy in respiratory diseases, as fluid extract

dross Scum, scurf The impurities floating on molten metals **opium-** Yenshee

Druce, F G R An English chemist noted as codiscoverer of the element dvimanganese (rhenium)

drug (1) A substance used as medicine It is assumed that drugs contain a pharmacophore and anchoring group (q v) (2) A material derived from vegetable or animal sources **crude-** The commercial form of a drug which requires refining before use **inorganic-** Inorganic salts, acids, or bases used as medicines, *e g*, sodium bicarbonate, mercury salts **official-** D listed in Pharmacopoeias **organic-** Organic compounds used as medicines

Drugs, Classification

1 According to composition or principal constituents

Inorganic chemicals—acids, bases, salts (q v)

Organic chemicals—alkaloids, glucosides, terpenes, synthetics (q.v.).
Biochemicals—proteins, starches, gums, oils (q.v.).

2. According to structure or physical characteristics:
Underground organs—roots, rhizomes, tubers, bulbs (q.v.).
Overground stems—woods, barks, herbs (q.v.).
Outgrowths of stems—leaves, flowers, fruits, seeds (q.v.).
Plant secretions and products—extracts, sugars, resins, gums, camphors, essential oils (q.v.).
Animals and animal tissues—insects, ductless glands (q.v.).
Animal secretions—serum and bacterial products (q.v.).

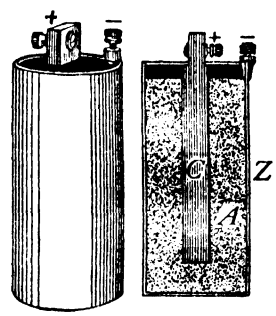
3. According to effect and use:
Therapeutic agents (q.v.).

4. According to origin and source:
Botanical classification (q.v.).
Insects, animal secretions and ductless glands (q.v.).

drumine. An alkaloid from the milky juice of *Euphorbia drummondii*, an Australian Euphorbiaceae; used as a local anesthetic.

Drummond, Thomas. 1797–1840. An English engineer, who invented the calcium light or limelight, q.v.

dry. (1) Free from moisture. (2) To evaporate. **air-Dried** in air. **bone-completely** free from water. **d. battery.** Set of dry cells. **d. cell.** An electrical cell of moist paste instead of a liquid electrolyte. See *Gassner cell* and figure. **d. ice.** Drikold. Solid carbon dioxide used as a refrigerant. **d. method.** Analysis by heat; e.g., blowpipe analysis, spectrum analysis, pyrolysis.



Dry cell.
C = carbon
Z = zinc
A = ammonium nitrate

dryers. Driers.

drying. The removal of moisture or water by heat, vacuum, or chemical agents. Cf. *dehydration*. **d. agents.** (1) Driers. (2) An agent that removes water, as heat or chemicals (see *desiccant*). Drying agents for organic liquids (alcohols, etc.) are, metallic sodium, calcium oxide, metallic calcium, barium oxide, aluminum amalgam. **d. oil.** A liquid fat which absorbs oxygen and becomes hard and resinous. They are mainly the glycerides of linoleic and linolenic acids which dry up forming varnish-like masses, and do not produce elaidin, *e.g.*, linseed oil, poppy oil, tung oil. **d. oven.** A receptacle used for drying by heat. **d. tube.** A U-shaped glass tube filled with a drying agent; (*e.g.*, calcium chloride, sulfuric acid); used for drying gases and vapors.

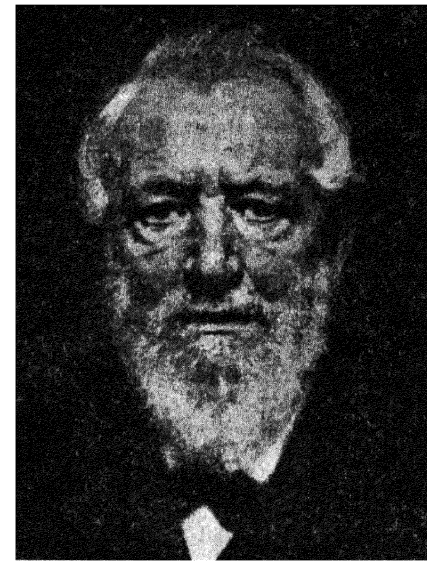
drypophantin. $C_{23}H_{18}O_5$ = 544.2. The coloring matter of red pea gall. It yields purpurogallin and glucose on hydrolysis.

Ds. The symbol for dysprosium. (Also Dy.)

dualin. An explosive composed of 50 % nitroglycerin and 50 % nitrated sawdust.

dubhium. Db. A supposed element isolated in 1916 by Eder, but identical with ytterbium.

duboisine. $C_{17}H_{23}O_3N$ = 289.2. *l*-Hyoscyamine. An alkaloid from the leaves of *Duboisia myoporoides* (corkwood), a Solanaceae of New South Wales. Microscopic, white needles, m.107, sparingly soluble in water, soluble in alcohol, ether, or chloroform. Used as a sedative, hypnotic, and mydriatic, and related to belladonine, atropine and hyoscyamine. **d. hydrobromide.** $C_{17}H_{23}O_3N.HBr$ = 370.13. A yellow, granular, hygroscopic powder, soluble in water, alcohol, or ether. **d. hydrochloride.** $C_{17}H_{23}O_3N.HCl$ = 325.67. A yellowish, deliquescent powder, soluble in water, alcohol or ether. **d. sulfate.** $(C_{17}H_{23}O_3N)_2H_2SO_4$ = 676.4. A yellowish powder, soluble in water, alcohol or ether; used for hypodermic medication as a substitute for atropine.


Emil Du Bois-Reymond.

Du Bois-Reymond, Emil. 1818–1896. A German physiologist and pioneer in the study of diffusion and animal electricity. He devised the mirror galvanograph and the spring myograph.

Duboscq colorimeter. See *colorimeter*.

duco. A trade name for lacquer.

ductile. Able to be drawn out into a fine wire.

ductility. The extent to which a solid is ductile. **d. machine.** A mechanical device for testing the ductility of materials; *e.g.*, metals, asphalt, and bituminous materials. Cf. *chew*.

ductless glands. Glands of the mammalian body that secrete enzymes into the blood which perform important chemical reactions. Cf. *hormones*. Some are used therapeutically, *e.g.*, Thyroidum siccum (dried thyroid gland), Suprarenalum siccum (dried suprarenal gland). Cf. *adrenaline, hypophamine, thyroxine*.

Dudley apparatus. A glass apparatus for the determination of sulfur in iron and steel by the bromine method. **D. pipet.** A pipet graduated

so as to deliver 100 cc water at 10°C in 35 seconds Used for viscosity tests

dufrenite $H_3Fe_2PO_7$ A fibrous, greenish, orthorhombic, hydrous iron phosphate

dufrenoysite $Pb_2As_2S_5$ A gray, orthorhombic, brittle, lead sulfarsenide, d 5 5, hardness 3

dugaldine A glucoside from *Helenium* (*Dugaldia*) *hoopesii*, Western sneezewood, a Compositae

dugong oil The oil from the superficial fat of the sea-cow, *Halicore australis*, a herbiverous aquatic mammal, used as a substitute for cod-liver oil

dulcamara Bittersweet, woody nightshade, scarlet berry, felonwood, violet bloom The young branches of *Solanum dulcamara*, a Solanaceae, used medicinally as fluid extract It contains several glucosides and 1 % solanine, dulcamarin, etc

dulcamarin $C_{22}H_{34}O_{10}$ = 458 3 A glucoside from the stems of *Solanum dulcamara*, it is hydrolysed by dilute acids to dulcamarrhetin

dulcamarrhetin $C_{16}H_{26}O_6$ = 314 2 A dark-brown, tasteless, resinous substance, obtained as split product from dulcamarin

dulcigen A compound which yields a sweet-tasting substance Cf *chromogen*

dulcin (1) Sucrol (2) Dulcitol

dulcine Dulcitol

dulcite Dulcitol

dulcitol $C_6H_{14}O_6$ = 182 15 Euonymin, dulcin, *1 2 3 4 5 6*-hexanehexol*, dulcite, dulcose, melampyrine, hexahydrohexane, $HOCH_2(CHOH)_4CH_2OH$ A hexatomic alcohol from the sap of *Melampyrum*, *Scrophularia*, and *Euonymus* species Colorless, monoclinic needles, d 1 466, m 188 5, b 275–280, slightly soluble in water, alcohol, or ether, used as a sweetening for diabetics **iso-** Rhamnose

dulcose Dulcitol

Dulin rotarex An electrically-driven centrifuge, used for determining the mineral matter in asphalts, etc

Dulong, Pierre Louis 1745–1838 A French chemist noted for work on the specific heat of elements and on nitrogen compounds **D and Petit law** The elementary atoms or molecules have an equal capacity for heat, (the atomic heat capacity AH) Thus, atomic weight × specific heat is approximately 6 2, and is the same for all elements (at constant pressure) Certain elements of low atomic weight and high melting-point, obey the law only at high temperatures (*e g* , Be, B, C, Si)

Dumas, Jean Baptiste André 1800–1884 A French chemist noted for research on atomic weights, the gravimetric decomposition of water and the composition of air **D bulb** A thin, blown, glass bulb drawn out to a fine opening, used in vapor-density determinations

dumasin An isomer of mesitone obtained on dry distillation of calcium acetate

dumortierite $Al_8HBSi_3O_{20}$ An orthorhombic, blue, black-green, lavender, or black, rock-forming aluminum boro-silicate, d 3 3, hardness 7

dumosa oil An oil from *Eucalyptus dumosa* Cf *lerp*

dundakine An alkaloid from the bark of *Sarcocephalus esculentus*, (dundaki), a Rubiaceae of the Cameroons

dundasite A rare aluminum and lead carbonate

dung bacteria Caprophyl The bacteria which occur normally in manure

dunite A grayish-green peridotite rock, consisting of chrysolite and olivine, from Corundum Hill, N C

Dunning colorimeter A device for comparing colored solutions, especially adapted to the estimation of phenolsulfonephthalein which is excreted with the urine in the renal function test

duotal Guaiacol carbonate

duplet Doublet A pair of electrons which is shared by two atoms and corresponds with a single, nonpolar bond

duplex slide rule A slide rule marked with chemical and physical constants

Dupont nitrometer An arrangement of gas burettes for the determination of nitrogen in explosives

duprene Trade name for a synthetic rubber made by polymerization of chloroprene Cf *vinyl acetylene*

durain A constituent of coal, q v

duralium An alloy of 93–95 % Al, 3 5–5 5 % Cu, and small amounts of magnesium and manganese, used for chemical equipment, as, retorts

duralumin A strong, hard, and resistant alloy of 0 5 % Mg, 0 25–1 00 % Mn, 3 5–4 5 % Cu, and 93–95 % Al, with traces of Fe and Si It can be machined like wrought iron, and resists dilute acids and sea-water

durangite $AlNaFAsO_4$ An orange-red, monoclinic sodium aluminum fluo-arsenate, soluble in sulfuric acid, d 3 95, hardness 5

durene $C_{10}H_{14}$ = 134 16 *α-* or **s-** Durol, 1 2 4 5-tetra-methylbenzene, $C_6H_2Me_4$ Colorless, monoclinic crystals, m 79, b 193, insoluble in water, soluble in alcohol, ether, or benzene *β-* or **iso-** 1 2 3 5-tetramethylbenzene A colorless liquid, b 195 *γ-* or **v-** Prehnitene 1 2 3 4-tetramethylbenzene A colorless liquid, m −4, b 204 **hexahydro-** Tetramethyl *cyclohexane*

durenol $C_{10}H_{14}O$ = 150 1 The phenol derived from durene 1 2 4 5-tetramethyl-3-hydroxybenzene

duridine $C_{12}H_{15}N$ = 149 12 Aminodurene, 3-amino-1 2 4 5-tetramethyl benzene

durilon A resistant alloy of 84 5 % Fe, 14 % Si, and 1 5 % of other elements

durite Trade name for a phenol-formaldehyde plastic

durium A synthetic resin used particularly for phonograph records

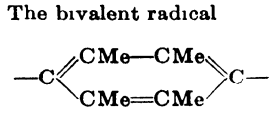
durol Durene

durra Kaffir corn, broom corn, shallu The plant or seeds of *Sorghum vulgare* (*Andropogon sorghum*) of South Africa

durrin $C_{14}H_{17}NO_7$ = 311 14 A cyanogenetic glucoside from the young plants of durra

duryl The monovalent radical, Me_4C_6H—, derived from durene **d aldehyde** $C_{10}H_{12}O$ = 148 09 2 4 5-trimethylbenzaldehyde $Me_3C_6H_2CHO$

durylene The bivalent radical



durylic acid $C_{10}H_{13}O_2$ = 164 1 2 4 5-trimethylbenzoic acid, cumylic acid, $C_6H_2Me_3COOH$ A monobasic acid derived from durene Colorless crystals, m 150, are soluble in water, alcohol, or ether **iso-** 2 4 6-Trimethyl-benzoic acid

dust A finely-powdered earth or waste material The median size of outdoor d is 0 5 microns, industrial d 1 5 microns **cosmic-** The finely divided matter floating in the outer layers of the atmosphere, and supposed to originate from meteors, and comets **industrial-** The organic (fibers, flour, etc) and inorganic (rocks, metals) particles produced in mills mines, polishing, cutting and other plants

Dust	Millions of particles per cubic foot air		
	Min	Av	Max
Outdoor air during rain	0 3	0 3	0 4
Grinding shop	1 2	4 8	25 0
Cement plant	0 6	26 0	105 0
Granite cutting	2 4	59 2	201
Coal mining	5 3	112 0	253
Anthracite mining	3 6	231	954

d chamber An enlargement in a flue in which the more solid particles of fumes, gases or vapors may collect **d precipitator** A d chamber equipped with charged high-tension wires, which precipitate solid particles from fumes or vapors See *Cottrell precipitator*

dusting Applying a fine powder as **cotton-**, spraying a cotton field, **forest-**, spraying a forest with calcium arsenate or other disinfectants from an airplane in order to control pests **d powders** The fine-grained solids used in medicine to sprinkle over wounds or on the skin, as, talcum powder

Dutch liquid Ethylene dichloride **D metal** An alloy of 80 % copper and 20 % zinc **D process** An old method of preparing white lead, still used today It is the slow formation of lead carbonate from lead by the carbon dioxide evolved from fermenting bark **D white** A white lead pigment adulterated with 2 parts barium sulfate in 3 parts of pigment

dvi The Sanskrit for two or second It has been applied to the second un-discovered element of a group in the periodic system Cf *eka-elements*

dvicesium Virginium, verium The element of atomic number 87, Dc = 224, more correctly named eka-cesium Cf *russium*

dvimanganese The element of atomic No 75 See *rhenium*

dvitellurium Polonium

Dvorkovitz process The low temperature carbonization of coal in vertical retorts, the gas being drawn off at the bottom

dwi Dvi

Dy The symbol for dysprosium (Also Ds)

dyad A divalent element or radical Cf *monad, triad*

dyamettin A glucoside from the root of *Cissampelos pareira* Cf *deyamettin*

dye A coloring matter used in solution for staining materials, as opposed to pigments which are used in suspension, *e g* , for painting A dye consists of a chromophore group and a salt-forming group (anchoring group) Cf *dyes* **d bath** A solution of a dye for dyeing **d stuff** Dye **d. wood** A wood that yields a coloring matter on extraction Cf *brazilwood hematoxylon*

Dyer, Bernard 1856– A British chemist noted for his work on analysis, with particular reference to foodstuffs, and agricultural products

dyes Dyestuffs They are generally coal tar or aniline colors Classification

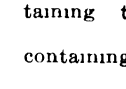
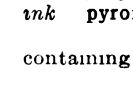
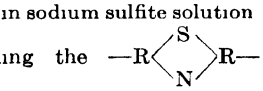
A based on application

1 Substantive or direct d , which dye directly by mere immersion in (a) *acid* or (b) *basic* bath
2 Adjective or mordant d , which require a fixing agent
3 Sulfur d , which need a sodium sulfide bath followed by oxidation
4 Vat d which are generally insoluble and applied in their soluble and colorless reduced or leuco-state and oxidized afterwards
5 Ingrain colors, deposited on the fabric as a result of the formation of an insoluble dye by chemical reaction The fiber is immersed first in one, then the other reagent

B based on structure

1 nitro-nitroso dyes *e g* , aurantia, naphthol yellow
2 azo-oxy dyes *e g* , curcumin
3 pyrazolone dyes *e g* tartrazine
4 azo-tetrazo dyes *e g* , tropaeolin, acid yellow, tropidines
5 hydroxyketone dyes, *e g* , alizarin dyes
6 di-, triphenylmethane dyes *e g* auramine, malachite green
7 pyrone, xanthone, fluorine derivatives, *e g* , eosin
8 indamines and indophenols, *e g* , toluene blue
9 azines
10 oxazines, and thiazines, *e g* , methylene blue
11 quinoline and acridine dyes, *e g* , quinoline yellow
12 thiazole and sulfur dyes, *e g* , primulin
13 natural dyes, *e g* , luteolin, morin

See *blue* d , colors **acid-** (1) D which color the acidophile or basic granules of the protoplasm (generally the cytoplasm), as, eosin congo red, methyl blue (2) Substances used for dyeing fibers in an acid solution, *e g* , nitro and azo d **acid-mordant-** Substances used for dyeing animal fibers in acid solution with the aid of a mordant **acridine-** D derived from acridine **adjective-** Mordant dyes **artificial-** Synthetic coloring matters, (*e g* , coal tar dyes) as opposed to natural coloring matters **azine-** Those containing the tetravalent =N—N= group **azo-** D containing the azo-group **bacteriologic-** D used to stain protoplasm, they may be acid- basic-, neutral- or specific- **basic-** (1) D which color the basophile or acid granules of the protoplasm (generally the nucleus and nucleo proteins), as, hematin, safranine, methylene blue (2) D used for dyeing in alkaline solution **direct-** Substantive dyes **leuco-** Vat dye **mineral-** inorganic substances used in dyeing, *e g* , iron salts, chromates, and copper salts **mixed-** Polygenetic d **monogenetic-** Substances which dye only in one color **mordant-** Substances which require an additional substance for fixation on the fibre **natural-** Coloring matters

from vegetable or animal materials, *e g*, indigo, carmine **neutral-** D which color both the acidophile and basophile portions of protoplasm **nitro-** Substances used for dyeing and containing the nitro radical **nitroso-** D containing the nitroso group **oxyazine-** D containing the  group **oxyazo-** Substances containing azo- and oxy-groups **oxyketone-** D containing the quinone group **polygenetic-** D which produce two or more colors, *e g*, alizarin **provisional-** See writing *ink* **pyronine-** Substances used for dyeing containing the  group **specific-** D which color a definite and selective portion of protoplasm **substantive-** Substances which stain a fibre directly, without use of a mordant **sulfide-** Insoluble d used in a sodium sulfide bath and oxidized afterward **sulfite-** Substances used for dyeing in sodium sulfite solution **thiazine-** D containing the  group **triphenylmethane-** D derived from triphenylmethane **vat-** D developed by oxidation after saturating the fiber or material with colorless solutions, and generally derived from anthracene or indigo, **vegetable-** D derived from plants, as

Reds and Purples	
alkanet	madder
annatto	rouge
brazilwood	sandalwood
camwood	sappan
cudbear	turkey red
hematoxylon	turnsole
litmus	
Yellows and Oranges	
fustic	osage orange
gamboge	saffron
henna	weld
morin	
Blues and Greens	
indigo	Chinese green-indigo
woad	

dymal Didymium salicylate

dynad The intra-atomic field of force

dynalkol A mixture of 70 % gasoline, 26 % alcohol and 4 % benzene, used as motor fuel

dynambin A papaverine-yohimbine tartrate, used in the treatment of pyorrhea and endocrine disturbances

dynamic Forces not in equilibrium, and resulting in motion, opposed to static **d allotropy** Desmotropy **d formula** See *benzene ring* **d isomerism** Tautomerism

dynamics A branch of physics dealing with the mathematical theories of forces not in equilibrium, hence producing action

electrons in motion = electrodynamics
atoms in motion = } thermodynamics
molecules in motion = }
masses in motion = (gravitation) mechanics

dynamites A class of explosives, usually a mixture of trinitroglycerin TNG with an absorbing inert material (*e g*, kieselguhr, gelatin) See table

dynamo A machine for converting mechanical into electrical energy Cf *alternator, electric motor, commutator*

dynamometer An apparatus which measures the force or power developed by an engine

dyne The c g s unit of force, or the force which, when acting for one second will give to one gram a velocity of one centimeter per second, hence, 1 dyne = 1 gram/gravity acceleration in cm per sec per sec = 1/980 665 gram = 1 02 mg, and 980 665 dynes = 1 gram **mega-** Bar 10^6 or 1,000,000 dynes = 1 013 kg **d centimeter** The work done by a force of one dyne exerted along a distance of one centimeter, *e g*, the work required to raise 1 02 mg one centimeter 1 dyne-centimeter = 1 erg

dypnone $C_{16}H_{14}O$ = 222 11 PhCO CH CMe-Ph A condensation product, b_{22mm} 225, of two molecules of hypnone

dysalbumose An albumose obtained from fibrin by the action of pepsin A brownish powder insoluble in water

dyscrasite Ag_3Sb A grayish-black, rhombic silver antimonide, d 9 6, hardness 3 5

dyslysin (1) $C_{24}H_{36}O_3$ = 372 4 A resinous, dehydrated split-product of choline acids (2) An anhydrous decomposition product of bile acids

dysprosium Ds or Dy = 162 46 Atomic number 66 A rare earth metal discovered in holmia by Lecoq de Boisbaudran in 1886 It is trivalent, forms yellow or greenish salts and occurs in small amounts in samarskite and gadolinite **d acetate** $Dy(C_2H_3O_2)_3 \cdot 4H_2O$ = 411 59 Yellow needles decomp 120 soluble in cold water **d chloride** $DyCl_3$ = 268 9 Greenish-yellow crystals d 3 67, m 680, soluble in water **d nitrate** $Dy(NO_3)_3 \cdot 5H_2O$ = 438 5 Yellow crystals, m 88, soluble in water **d oxalate** $Dy_2(C_2O_4)_3\ 10H_2O$ = 769 08 Yellowish prisms, insoluble in water **d oxide** Dy_2O_3 = 373 0 A colorless powder, d 7 81, insoluble in water **d sulfate** $Dy_2(SO_4)_3\ 8H_2O$ = 757 0 A yellow crystalline powder, soluble in water

dystectic mixture An alloy or mixture of maximum melting or freezing point, *i e*, those proportions of two or more metals which produce the highest constant melting point Cf *eutectic mixture*

DYNAMITES

Kieselguhr d	72–75 % TNG, 28–25 % kieselguhr
Pittsburgh d	40 % TNG, 44 % $NaNO_3$, 15 % woodpulp, 1 % $CaCO_3$
U S A gelatin d	20–80 % TNG, 0 3–4 5 % guncotton, 6–16 % combustible m, 1 5–62 % $NaNO_3$, 1 % $CaCO_3$
U S A straight d	15–75 % TNG, 5–66 % $NaNO_3$, 5–20 % combustible m, 1 % $CaCO_3$
U S A ammonia d	12–25 % TNG, 7–50 % NH_4NO_3, 14–60 % $NaNO_3$, 8–20 % combustible m, 1 % $CaCO_3$

E

E Symbol for (1) electromotive force, (2) electrode potential E_0. Symbol for electro-affinity

E An einstein, 6.06×10^{23} quanta Cf *faraday*

e The base of natural logarithms, e = 2.718,281,828 (see *exponential*) e^{-1} A mathematical constant, $e^{-1} = 0.367,879,441$

e (1) The symbol for an electron, as in $H = H^+ + e$ (2) The elementary electrical charge, the charge on an electron, half the charge on an α-particle. $e = 4.770 \times 10^{-10}$ e s u $= 1.591 \times 10^{-20}$ e m u $= 1.591^{-19}$ coulombs *e/m* The ratio of charge to mass of an electron

VALUE OF *e/m*

	Spectroscopic	*By deflection*
e/m	(1.761 ± 0.001)	(1.769 ± 0.002) $\times 10^7$ e m u per g
(*e/m*)c	(5.279 ± 0.003)	(5.303 ± 0.006) $\times 10^{17}$ e s u per g

ϵ The Greek letter, epsilon (1) An ergon or quantum, q v (2) An etheron, q v (3) A symbol for dielectric constant (4) Electrode potential, ϵ_c to a normal calomel electrode, ϵ_h to a normal hydrogen electrode

η The Greek letter, eta (1) The symbol for viscosity

earth (1) The soil (2) The solid portion of the globe, or lithosphere, (see *abundance*) (3) The globe, as distinguished from other heavenly bodies **diatomaceous-** Kieselguhr **Fuller's-** *Fuller's* earth **green-** Terra verde **infusorial-** Kieselguhr **rare-** See *rare earth metals* **red-** Ocher **siliceous-** Kieselguhr

e age The period of existence of our planet as calculated from geologic, radioactive and cosmic data Thus the four stages of the e are assumed to be

1 gaseous 2 fluid surface	10^5 years
3 intermediate	$\pm 10^5$ years
4 solid	2.3×10^9 years

e constants The physical data of the e

equatorial radius (a) 6,378,388 meters = 3,963.2 miles
polar radius (b) 6,356,911 meters = 3,949.8 miles
one degree latitude at equator = 68.70 miles
one degree latitude at pole = 69.41 miles
mean density of the earth 5.5247
mean density of continental surface 2.67
Rigidity of the earth (n) 8.6×10^{11} c g s units
Viscosity of the earth (e) 10.9×10^{16} c g s units
Volume of the earth $1,083,319 \times 10^6$ km³
Area of the earth 510,100,934 km²
Area of the land 148,847,000 km²
Area of the ocean 361,254,000 km²
Mean distance from earth to sun = 149,500,000 km = 92,900,000 miles
Mean distance from earth to moon = 384,393 km = 238,854 miles

e alkali metals. The elements of the second group of the periodic system, Mg, Ca, Sr, Ba, and Ra They are all divalent **e. flax** Amianthus **e inductor** An electrical coil, which rotates in a frame **e metals** The elements of the third group of the periodic system Al, Sc, Y, La They are all trivalent **rare-** The elements of the fifth sub-period from cerium (atomic number 58) to hafnium (atomic number 72) **e nut oil** Arachis oil **e oil** Petroleum or asphalt **e shellac** Acaroid resin **e wax** Ozocerite

earthenware Pottery made from dried clay See *ceramics*

East Indian oil An essential oil d 0.948–0.970 from *Anethum sowa*, an Umbelliferae It contains limonene and apiol

Easton syrup A pharmaceutical preparation containing iron, quinine, and strychnine phosphates

eau French for water **e de cologne** Cologne *water* **e dejavelle** A solution of potassium hypochlorite, used as a bleaching agent **e de labarraque** A solution of sodium hypochlorite, used as a bleaching agent

Ebert and Merz's acid Naphthalene-2,6- or 2,7-disulfonic acid

eblanin Paraxanthine

Ebner fluid A mixture of 2.5 cc hydrochloric acid, 2.5 gm sodium chloride, 100 cc water, and 500 alcohol, used for decolorizing in bacteriological work

ebonite A black, vulcanized, hard rubber Cf *vulcanite*

ebony A hard, dark heavy wood from various *Diospyros* species (Ebenaceae)

ebul, ebulus The dwarf elder, *Pilea grandis*, an Urticaceae of the West Indies The berries are used for an alcoholic beverage

ebullient Bubbling or boiling

ebulliometry Ebullioscopy

ebulliscope An apparatus for the exact determination of the boiling point, *e g*, a molecular weight apparatus

ebullioscopic equation An equation showing the relation of the molecular weight of the solute to the rise in boiling-point of a solution in which it is present Mol Weight = p(d/t), where p is the percentage (weight in grams per 100 grams solvent), d the molecular rise in boiling point, and t the observed rise in boiling point

ebullioscopy A branch of physical chemistry that deals with the determination of molecular weights from the increase in boiling point of a solution Cf *Raoult's law*

ebullition The formation of bubbles, *e g*, in boiling

ecbalin Elateric acid

ecballium Elaterium

ecbolics Oxytocics

ecboline An alkaloid of ergot

eccentric (1) Not concentric (2) Not circular, *e g*, an orbit (3) With the axis away from the center (4) Outside the center or away from the center, the center misplaced

ecgonidine *dl*-Anhydroecgonine

ecgonine. $C_9H_{15}O_3N\ H_2O$ = 203 19 Tropine carboxylic acid A split-product of cocaine, q v White, monoclinic prisms, m 198, soluble in water or alcohol, slightly soluble in ether **anhydro-** See *anhydro* **ethylbenzoyl-** Cocethyline **methylbenzoyl-** Cocaine

e hydrochloride. $C_9H_{15}O_3N\ HCl$ = 239 66 Colorless, triclinic leaflets, m 246, soluble in water, slightly soluble in alcohol

echelon cell A wedge-shaped glass cell used in absorption spectroscopy for the rapid photography of spectra through different thicknesses of absorbing liquid

echicaoutchin $C_{25}H_{40}O_2$ = 372 4 An elastic resin-like substance from the bark of *Alstonia scholaris*, dita bark, q v

echiceric acid $C_{30}H_{46}O_4$ = 470 5 An oxidation product of echicerin

echicerin $C_{30}H_{48}O_2$ = 440 5 A principle from dita bark Colorless needles, m 157, insoluble in water, soluble in alcohol, ether, or chloroform

echiine An alkaloid from *Echium vulgare*, a Boraginaceae, which produces tetanic convulsions

echinacea The dried rhizome of *Brauneria pallida* (*Echinacea angustifolia*) a Compositae of Northern America, used as an alterative, eliminative, and "systemic" antiseptic, as fluid extract

echinacoid The combined principles of echinaceae, used in the dry state

echinochrom A brown respiratory pigment found in sea urchins Cf *porphin derivatives*

echinopsine $C_{10}H_9ON$ = 159 1 An alkaloid from *Echinops* species, globe thistle, a Compositae, it is similar in action to strychnine

echinulate A growth of bacteria characterized by toothed or pointed margins or outgrowths

echitamine Ditaine

echitenine $C_{20}H_{27}O_4N$ = 345 0 An alkaloid from dita bark A brown, amorphous powder, m 120, soluble in alcohol or chloroform

echitin. $C_{32}H_{52}O_2$ = 468 51 An acid from dita bark Colorless leaflets, m 170, soluble in hot alcohol, or chloroform, sparingly soluble in ether

echugin $(C_5H_8O_2)_x$ A crystalline glucoside from *Adenium bœhmianum* and an active principle of African arrow poisons, its effect is to arrest the heart in systole Small, colorless, rhombic scales, readily soluble in water or alcohol insoluble in ether

eclogite A rock consisting chiefly of augite and hornblende

ecology A branch of biology dealing with the habits of organisms, and their mode of life in relation to their surroundings

ectoplasm The outer compact hyaline layer of protoplasm of a cell

eddy currents The electrical currents set up by alternating currents in masses of metal near or in the circuit Cf *Foucault current*

edenite A light-colored hornblende containing some iron

Eder's solution A solution of mercuric chloride and ammonium oxalate, used in photometric determinations The amount of Hg precipitated is related to the intensity of the x-ray irradiation

edestan A protean and slightly denatured edestin

edestin A globulin, M W 29,000, from hemp, rye and cotton seeds, which is deficient in cystine and lysine

edge filtration Same as stream-line filtration

edingtonite $BaAl_2Si_3O_{10}\ 4H_2O$ A grayish-white, rhombic, barium aluminum silicate, d 2 7, hardness 4–4 5, soluble in HCl

edinol $C_7H_9O_2N$ = 139 08 p-Amino-saligenin, used as a photographic developer

Edison, Thomas Alva 1847–1931 An American physicist and inventor noted for many important inventions, e g , telegraphic transmission, phonograph, incandescent lamps, moving pictures, poured concrete buildings **E cell** An accumulator consisting of iron and nickel oxide electrodes in 20 % potassium hydroxide solution **E effect** An electrode opposite a glowing filament becomes negatively charged **E Lelande cell** A voltaic cell of 0 7 volt, consisting of an amalgamated zinc electrode and copper electrode in a solution of KOH

effective Producing an action or bringing about a result **e acid** The amount of acidity, q v

effervescence The frothing or bubbling of a liquid due to the escape of gas, but not due to boiling, *e g*, from carbonate solutions when acids are added

effervescent Giving off gas bubbles, as in soda water, champagne **e mixture** A mixture of substances which will form a gas when moistened or brought into solution, *e g*, baking powders, soda water mixtures **e salts** Medicinally-active substances mixed with sodium bicarbonate and citric or tartaric acid Used to administer medicinal agents of a refreshing draught

efficiency (1) The ratio of the useful work done by a machine to the energy supplied (2) In statistics The proportion of the total available data which is relevant according to the theory of probability

efflorescence The property of a crystalline substance to become anhydrous when exposed to air and crumble to a powder, (*e g*, washing soda, $Na_2CO_3\ 10H_2O$)

efflorescent Tending to lose the water of crystallization and crumble to a powder

effluent (1) A waste product discharged from a process (2) Emergent, *e g*, radiations

efflux The flowing or the velocity of a liquid

effuse Describing a thin, veil-like, spreading growth of bacteria

effusiometer An instrument invented by Bunsen for the determination of the molecular weights of gases from effusion measurements

effusion (1) Pouring out or discharge (2) The escape of a gas under pressure through the small aperture of a vessel The relative rates of effusion of gases into air are inversely proportional to the square roots of their molecular weights

e g An abbreviation for exempli gratia = for example

egg An ovum consisting of shell, egg-white and volk **acid-** A closed acid-resistant storage tank for strong acids **dried-** Dehydrated and powdered e used in baking **storage-** An e kept in waterglass solution or in a frozen condition

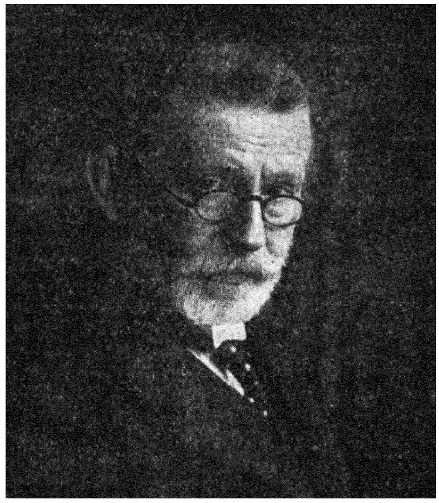
e albumen A crystallizable protein, M W 33,800, from egg-white **e magma** The frozen mixture of churned yolks and whites of selected eggs, used for mayonnaise manufacture and baking

eglantine $C_{12}H_{14}O_2$ = 192 12 *i*-Butyl-α-toluate, $Ph\ CH_2COOC_4H_9$ A colorless liquid, d 0 990, b 254, insoluble in water, a flavoring

eglestonite. Hg_4Cl_2O. A rare, native, mercuric chloride-oxide named after Thomas Egleston, an American mining engineer (1832–1900).

egols. A group of antiseptic substances consisting of the o-nitro-p-sulfonates of phenol, cresol, or thymol, with mercury and potassium; *e.g.*, **cres-** Cresegol, derived from cresol. **phen-**, Phenegol (q.v.), derived from phenol. **thym-**, Thymegol, derived from thymol.

egonol. An unsaturated alcohol from ego-oil from the seeds of *Styrax japonica.*



Paul Ehrlich.
(From Muldoon "Organic Chemistry.")

Ehrlich, Paul. 1854–1915. A German biochemist and founder of modern chemotherapy. He discovered salvarsan and staining methods, and advanced the side-chain theory. **E. 606.** Arsphenamine. **E. diazo reaction.** An intense red color produced by pathological urine on addition of the diazo reagent. **E. diazo reagent.** Solution A = 1 gm. sodium nitrite in 200 cc. water. Solution B = 5 gm. sulfanilic acid, 50 cc. hydrochloric acid and 950 cc. water. Mix 1 cc. of A and 50 cc. of B. **E. side chain theory.** See Ehrlich theory. **E. solution.** A solution of 2 gm. p-dimethyl-amidobenzaldehyde, 50 cc. hydrochloric acid, and 50 cc. water; used for detecting urobilinogen in urine. **E. theory.** Side-chain theory. A chemical theory explaining the phenomena of immunity by the action of antibodies (synonyms: immune substance, haptins, free receptors) which when circulating in an organism unite with and make harmless the antigen (synonyms: poisonous substance, invading substance, toxin, etc.) and thereby prevent the antigen from attaching itself to the chemical system of the protoplasm. It is assumed that any poisonous substance, before it affects a living cell, must enter the dynamic, ever-changing and reacting protoplasm by combining with certain atomic groups or radicals (the side-chains or receptors) of the protoplasm. The action may be expressed as follows: Antigen, the inciting substance or poisonous molecule. Antibody, the immune substance or neutralizing molecule. Active State (**poisoning or infection**). The antigen reacts with the protoplasm and forms antibodies. Immunization. The antigen is prevented from reacting with the protoplasm by combining with the antibodies—the cast-off sidechains or free receptors. The molecules are represented as geometrical figures which fit into each other. These and similar figures found in the literature indicate only the possibility of chemical union and have no other meaning.

Direct action: The antigen consists of a haptophoric group which anchors the toxin to the protoplasm, and a toxophoric group which causes the toxic disturbances in the cell:

(antigens)	(antibodies)
enzymes cause	antienzymes
phytotoxins cause	antitoxins
bacterial exotoxins cause	antitoxins
bacterial proteins cause	agglutinins
vegetable proteins cause	precipitins
animal proteins cause	precipitins
bacterial aggressins cause	opsonins
animal venoms cause	antivenins
foreign complements cause	anticomplements
foreign amboceptors cause	antiamboceptors.

Indirect action: The antigen consists of two substances, namely

(a) the *complement*, *addiment* (of Ehrlich), *cytase* (of Bordet and Metchnikoff), or *alexine* (of Buchner), which is composed of a zymphoric group, containing the poisonous radical, and a haptophoric group, with which it is anchored to the amboceptor.

(b) the *amboceptor*, *fixateur* (of Metchnikoff) *preparateur* (of Müller), *immune body* (of Pfeiffer), *sensitizer* or *intermediate body*, which is the bridge or link between the complement and the receptor. It contains a complementophile group which combines with the complement and a cytophile group which combines with the receptor of the cell. Vegetable cells and bacteria result in bacteriolysins. Animal cells result in cytolysins, hemolysins or leukotoxins **E. triacid stain.** A mixture of 120 cc. saturated aqueous solution of orange G, 80–165 cc saturated aqueous solution of acid fuchsin 125 cc. aqueous solution of methylene green 200 cc. alcohol, 100 cc. glycerin, and 300 cc water. Used for differentially staining white blood corpuscles.

eicosane*. $C_{20}H_{42}$ = 282.4. A saturated hydrocarbon of the methane series and a constituent of petroleum. A colorless liquid, d.0.777, m.37, $b._{15mm}$ = 205; insoluble in water, soluble in alcohol or ether.

eicosanic acid. $C_{20}H_{40}O_2$ = 312.28. A white solid, m.74, found (0.06 %) in Japan wax. Cf. *arachidic acid.*

eicosanoic acid*. Arachidic acid.

eicosanol*. Eicosyl alcohol.

eicosinene. Icosinene.

eicosyl. The monovalent radical $—C_{20}H_{41}$. **e. alcohol.** $C_{20}H_{42}O$ = 298.32. Arachidic alcohol, eicosanol*. The saturated compound, $Me(CH_2)_{18}CH_2OH$. A colorless solid, m.71, b.220 in palm wax of Madagascar.

eicosylene. The unsaturated hydrocarbon $C_{20}H_{40}$.

eigenfunktion, eigenfunction. [German for proper or characteristic function.] The *s*, *p*, *d*, or *f* state of the atom or ion. See *quantum numbers.*

eigenwert. A proper or characteristic value.

eigons. A group of compounds of iodine or bromine with proteins which, administered

internally, as antiseptics, liberate iodine or bromine in the alimentary canal or in wounds

eikonogen $NH_2C_{10}H_5OH\ SO_3Na\ 2\frac{1}{2}H_2O$ Sodium amido-β-naphthol monosulfate A white crystalline powder, used as a developer in photography

eikonometer A measuring scale which fits on to the eyepiece of a microscope and is seen superimposed on the image of the object

eikosane Eicosane

-ein, -eine A suffix which often indicates an internal anhydride

Einstein, Albert A German physicist noted for his mathematical generalizations **E equation for diffusion** The diffusion coefficient, D, is related to the gas constants by $D = RT/6\pi Nr\eta$, where N is Avogadro's number, r the radius of the molecule and η the viscosity **E formula** The relation between mass and energy is $Mc^2 = E$, where M is the mass in grams, c the velocity of light in cm per sec , and E the energy in ergs Cf *mass-energy cycle* **E law** In a photochemical reaction one quantum of energy affects one molecule of matter, thus $HI + h\nu = H + I$ **E particle equation** The motion of a particle in a liquid depends on its radius r and the viscosity, η of the liquid Let L be the length of the path during time t, then

$$L = \sqrt{t}\ \sqrt{\frac{RT}{N}}\ \frac{1}{3\pi\eta r}$$

E theory See *relativity* **E unit** Einstein **E viscosity formula.** $\eta = \eta_0(1 + k\phi)$, where η is the viscosity of the colloidal solution, η_0 the viscosity of the pure suspending medium, ϕ the total matter of colloid per unit volume, and k a constant varying from 1 5 to 4 75

einstein A unit of energy, $E = 6\ 06 \times 10^{23}$ quanta, analogous to the faraday ($6\ 06 \times 10^{23}$ electrons) It is the amount of radiation absorbed by a system to activate 1 gram-molecule of matter, hence, $E = Nh\nu$, where N is Avogadro's constant

eka The Sanskrit for one or first A prefix applied to the first undiscovered element in a group of the periodic system Cf *dvi-*

eka-elements The missing elements of the periodic table Cf *eka, dvi* The following elements have been discovered and named as shown

eka-aluminum	gallium
eka-boron	scandium
eka-cesium	virginium, verium
eka-iodine	alabamine, eline
eka-manganese	(nipponium), masurium
eka-neodymium	illinium
eka-silicon	germanium

ekaosmium Eo The element 94 obtained by neutron bombardment of uranium, it has a half-life of 90 minutes Synthesized by Enrico Fermi (1936), and named esperium

ekarhenium Er The element 93, obtained by neutron bombardment of uranium it has a half-life of 13 minutes Synthesized by Enrico Fermi (1936) and named ausonium

ekatantalum Et The element 91, which consists of the isotopes

Pa or protactinium	32,000 years
UZ or uranium Z	9 7 hours
Bv or brevium	1 65 mins

e pentoxide Et_2O_5 A white powder with slightly basic properties, forming salts with acids

ektebin An antigen ointment containing concentrated tuberculin (dead human and bovine tubercle bacilli) used in the treatment of tuberculosis

elæ- Elae-, ele-

elaeodic acid Ricinoleic acid

elaeolite Nephelite

elaeomargaric acid Eleostearic acid

elaeometer A hydrometer for ascertaining the quality of an oil from its density

elaeostearic acid Eleostearic acid

elaidic acid $C_{18}H_{34}O_2 = 282\ 37$ *trans-9*-Octadecenoic acid* An unsaturated, monobasic acid, and *trans*-isomer of oleic acid Colorless leaflets, $d_{79°}$ 0 851, m 51 5, b $_{60mm}$266, insoluble in water, soluble in alcohol or ether

elaidin $C_{57}H_{104}O_6 = 885\ 1$ The elaidic ester of glycerin It occurs in many oils other than drying oils and fish oils, and is an isomer of olein

elain Obsolete name for ethylene

elaoptene The liquid part of an essential oil, as opposed to the stereoptene or solid part

elastic Describing a substance which assumes its original shape after the pressure or force, causing distortion, is removed **e coefficient** Young's modulus **e constants** The numerical expressions of the force or pressure to which a material (solid, liquid, or gaseous) can be subjected without deformation of its shape or condition after the pressure has ceased to act **e fluid** A gas, as compared with a liquid **e limit** The stress or force which produces a permanent elongation or shortening of 0 001 % of the length of a substance **e modulus** Modulus of elasticity

elastica Rubber

elasticity The property of a substance of being able to recover from distortion or deformations caused by pressure or stress, and return to its original shape **adiabatic-** See *adiabatic*, **cubical-** The bulk modulus, or the hydrostatic pressure divided by the resulting decrease in volume per unit volume **limit of-** The smallest value of a stress which produces permanent alteration **longitudinal** Young's modulus **modulus of-** Rigidity modulus The relative flexibility, or the ratio of stress intensity to percentage strain **shear-** See *rigidity* **torsional-** See *rigidity*

elasticum A layer of carbohydrate material between the epithelium and cortex of wool, which is responsible for the shrinking of the latter

elastin A protein of yellow, elastic tissue, soluble in hot conc potassium hydroxide or sulfuric acid, partly attacked by pepsin and digestible by trypsin

elastomer A generic term (proposed by Fisher) for all substances having the properties of natural, reclaimed, vulcanised or synthetic rubber **synthetic-** Rubber substitutes Five classes, produced by (a) Polymerisation of butadiene alone or with styrene (*e g* , Ameripol, Buna, Hycar, Perbunan), (b) intereaction between sodium polysulfides and dihalides (*e g* , Thiokol), (c) polymerisation of chloroprene (*e g* , Duprene, Neoprene), (d) polymerisation of isobutylene (*e g* , Vistanex), (e) polymerisation and plasticisation of vinyl chloride (*e g* , Koroseal)

elastoplast A substance having both elastic and plastic properties

elateric acid $C_{20}H_{28}O_5$ = 348 27 Ecbalin An acid of elaterium, m 200

elaterin $C_{20}H_{28}O_5$ = 348 22 Memordicin A neutral principle from the juice of *Ecballium elaterium* and *Memordica balsamina*, a Cucurbitaceae A white, crystalline powder, α- m 232, β- m 195, insoluble in water, soluble in chloroform, sparingly soluble in alcohol or ether, used as a drastic purgative

elaterite $(CH_2)_x$ Mineral caoutchuc, elastic bitumen An inflammable, elastic, dark-brown, mineral resin, d 0 8–1 23

elaterium Ecballium Unpurified sediment from the juice of the fruit of *Ecballium elaterium* (squirting cucumber) chiefly containing elaterin, used medicinally as a powerful cathartic

elaterone $C_{24}H_{30}O_5$ = 398 23 A ketone from elaterium Colorless crystals, m 300

elatic acid $C_8H_{12}O_2$ = 140 09 An acid from colophony

elayl Ethylene **e chloride** Ethylene dichloride

elbon $C_{16}H_{14}O_2N_2$ = 282 2 Cinnamyl-p-oxyphenylurea White, fine, tasteless needles, m 204, insoluble in water, soluble in alcohol, acetone, or oils Used medicinally for disorders of the respiratory organs

elder Sambucus **dwarf-** (1) Ebulus, (2) *Aralia hispida*

eldrin Barosmin

Eldred's wire A nickel-steel wire with a copper jacket and a platinum sheath, which may be sealed into glass

elecampane. Inula

elecampin. Inulin

electret The electrical equivalent of a permanent magnet Thus waxes, *e g*, carnauba wax, when solidified in a strong electric field acquire a polarization (orientation of molecules) in the direction of this field

electric Charged with or capable of developing electricity Cf *electrical* **e arc** The luminous arc produced by the passage of electricity at high voltage from one electrode to another **e axis** The axis of a crystal that offers least resistance to the passage of an electric current **e attraction** The force by which oppositely charged bodies are drawn together **e battery** A series of dry cells (q v) or galvanic (q v) elements **e calamine** $ZnSiO_4 H_2O$ A native zinc silicate **e charge** A definite quantity of electricity, q v Cf *ballometer* **e conductivity** See *conductivity* **e current** The quantity of electricity, or the number of electrons flowing past a point per unit time When measured in e s u units it is the amount of electricity transferred in one second, in e m u units it is a current of such strength that one centimeter of the wire experiences a side-thrust of a force equal to one dyne, if at right angles to a magnetic field of unit intensity The practical unit is the ampère, q v, its quantity the coulomb, q v, and its potential difference the volt, q v **e double layer** See *electrolytic solution pressure* **e field** The forces around an electrically-charged body **e field intensity** A unit of force, (*e g*, magnetic) the ratio of the force acting on a quantity of electricity at a point to that quantity of electricity **e furnace** A furnace, q v used where hydro-electric power is cheap for dealing with molten electrolytes, as in the manufacture of aluminum **e lines of forces** The imaginary curves radiating from a positive toward a negative charge **e potential** Electromotive force **e radiation** See *electromagnetic radiation, spectrum* **e spark** A luminous discharge produced by the disruptive passage of electricity at high voltage from one electrode to another **e surface density** The distribution of electrons on a surface, measured by number per unit area **e tension** Electromotive force **e transformer** See *induction coil transformer, rectifier* **e valve** A device which allows an e current to pass in one direction only, as, a transformer, rectifier or vacuum tube **e wind** The effect produced by the motion of electrically-charged gas molecules

electrical Pertaining to electricity **e birefringence** Kerr effect **e capacity** See *capacity, electrostatic* **e cell** Voltaic cell Galvanic cell **e condenser** See *condenser* **e conductivity** Molal conductivity, molecular conductivity (1) The quantity of electricity transmitted by a unit area in unit time under a unit potential gradient (2) For solutions the conductivity in reciprocal ohms (mhos) of one gram equivalent of electrolyte, in a solution between electrodes one centimeter apart **e current** Electric c **e elements** Voltaic cells **e flux** The flow of an electric current **e pressure** Electromotive force **e units** See table

Unit of conductivity—MHO,
unit of electricity resistance—OHM,
unit of electricity current—AMPERE,
unit of electromotive force—VOLT,
unit of quantity of electricity—COULOMB,
unit of capacity—FARAD,
unit of work—JOULE,
unit of power—WATT **e work** The work necessary to decompose a compound expressed in electrical units

electricity A form of energy that produces magnetic, chemical, thermal and radiant effects, generated by friction, induction or chemical means (a) *material conception* An all-pervading fluid consisting of negative electrons, their continuous motion is a "current," their abrupt motion a "discharge," their absence a "positive charge" (b) *dynamic conception* A stress or strain in the ether resulting in "electric waves" and "radiation" (c) *magnetic conception* A field of force **acid-** Positive electricity **animal-** Electrical phenomena associated with animal organisms, *e g* Volta's experiment on frogs **atmospheric-** The e of the atmosphere, *e g*, from charged clouds **chemical-** Galvanic **dynamic-** Current-, or galvanic- as opposed to static e It indicates electrons in movement, *e g*, which can be utilized for work It may be either set in motion by chemical reactions (voltaic-), by induction (faradic-), or by a magnet (magnetic-) **faradic-** Induced- A current of high tension produced in a secondary coil when a galvanic current passes through the primary coil of an induction machine **franklinic-** Static- **frictional-** Static e obtained by friction, *e g*, rubbing a glass rod with flannel or fur **galvanic-** Dynamic- or voltaic- **induced-** Faradic- **negative-** The presence or accumulation of electrons, or a current of electrons passing from anode to cathode outside the galvanic cell, and from cathode to

anode within the galvanic cell **photo-** See *photoelectricity* **piezo-** See *piezoelectricity*

RELATIONSHIPS OF ELECTRICAL UNITS

Symbol	*Unit of*	*Practical*	*C G S e m u*	*C G S e s u*
O	resistance	1 ohm	10^9	1 1124 × 10^{-12}
A	current (strength)	1 ampere	10^{-1}	2 998 × 10^9
V	electromotive force (potential)	1 volt	10^8	0 0033349
F	capacity	1 farad	10^{-9}	8 9892 × 10^{11}
C	quantity	1 coulomb	10^{-1}	2 998 × 10^9
H	inductance	1 henry	10^9	1 1124 × 10^{-12}
J	work	1 joule	10^7	10^7

E M U = electro-magnetic units, based on the strength of magnetic poles (m and m') $m = r\sqrt{F\mu}$ where μ is the magnetic permeability of the medium, a quantity arbitrarily assumed as unity for air, F, the force at a point in the magnetic field, and r the distance It follows that $F = mm'/\mu r^2$ and the intensity, H, of the magnetic field = F/m

E S U = electrostatic units, based on the strength of electrical charges (q and q') $q = r\sqrt{Fk}$ where k is the specific inductive capacity or dielectric constant, a quantity arbitrarily assumed as unity for air, F, the force between two charges, r the distance It follows that $F = qq'/kr^2$

The dimensions of some electrical units are expressed in terms of the fundamental units of Length, Time, and Mass as follows

Name	*Symbol*	*Electrostatic*	*Electromagnetic*
electric quantity	q	$[L^{\frac{3}{2}}T^{-1}M^{\frac{1}{2}}k^{\frac{1}{2}}]$	$[L^{\frac{1}{2}}M^{\frac{1}{2}}\mu^{-\frac{1}{2}}]$
magnetic quantity	m	$[L^{-\frac{1}{2}}M^{\frac{1}{2}}k^{\frac{1}{2}}]$	$[L^{\frac{3}{2}}T^{-1}M^{\frac{1}{2}}\mu^{\frac{1}{2}}]$
magnetic field	H	$[L^{\frac{1}{2}}T^{-2}M^{\frac{1}{2}}k^{\frac{1}{2}}]$	$[L^{-\frac{1}{2}}T^{-1}M^{\frac{1}{2}}\mu^{-\frac{1}{2}}]$
current	I	$[L^{\frac{3}{2}}T^{-2}M^{\frac{1}{2}}k^{\frac{1}{2}}]$	$[L^{\frac{3}{2}}T^{-1}M^{\frac{1}{2}}\mu^{-\frac{1}{2}}]$
potential or electromotive force	V, E	$[L^{\frac{1}{2}}T^{-1}M^{\frac{1}{2}}k^{-\frac{1}{2}}]$	$[L^{\frac{1}{2}}T^{-2}M^{\frac{1}{2}}\mu^{\frac{1}{2}}]$

positive- (1) An absence or deficiency of negative electrons (2) A current in the direction opposite to negative- According to this theory the true current of electricity flows from negative to positive, *i e* , from the region of an accumulation of electrons to that of a deficiency of electrons **static-**, frictional-, or franklinic-, as opposed to dynamic- It indicates electrons at rest, and their sudden, explosive-like escape after accumulating on the surface of an insulated conductor It is produced by friction between solid surfaces **thermo-** (1) E produced by heat (2) Pertaining to the heating effects of electricity **tribo-** E produced by friction **voltaic-** A current produced by an electric battery

electrification Charging with electricity or electrons

electrify To charge with electricity, or separate the neutral charge of a substance into negative (accumulation of electrons) and positive (deficiency of electrons) portions

electrion An early name for an electron

electroaffinity E or E_0 Electrolytic potential The electrode potential (q v) for a concentration corresponding with 1 gram ion per liter of ions liberated from an electrode Thus it is the force with which the atoms hold their ionic charges See *electromotive force*, *free energy*

electroanalysis Analytical methods based either on electrolysis or conductometry, as electrometric titration Cf *polarograph*, *spectrograph*, *magneto-optic method*, *sectrometer*

electrochemical Pertaining to both chemistry and electricity **e constant** Faraday **e deposition** The formation of a metallic layer by electrolysis either for (*a*) recovery of metals from solutions of ores (Cu, Zn, Cd), or refining crude metals (Cu, Pb, Ni, Ag, Au), or (*b*) electroplating, to produce a protective coating (Au, Ag, Ni, Cr, Cu) or for reproduction (Ni, Cu, Zn) *e g* , in photo-engraving **e equivalent** The mass in grams of any element deposited from an electrolytic cell by an electric current of one coulomb The electrochemical equivalent (E) of any element is

$$E = (A/V)0\ 00001036$$

where A is the atomic weight, and V the valency of the element for the electrolyte used Cf *Faraday's Law* A/V is the chemical equivalent **e series** Displacement series **e spectrum** A current-voltage graph produced by the polarograph (q v)

electrochemistry A branch of science dealing with the processes of transforming chemical into electrical energy, and vice versa, hence, the study of chemical reactions which cause, or are caused by, a flow or transfer of electrons, as in batteries and in electrolysis **applied-** The application of e to industry as electro-deposition and electrolysis, q v

electrocratic Describing a colloid (*e g* , gold), that owes its stability in to an electric charge

electrode The appliance by which an electric current passes in or out of a cell apparatus or body It may vary in form from a simple wire to complex devices, (hydrogen e , calomel e), or it may be the container of the cell itself (crucible, vacuum tube or valve) **auxiliary-** A standard calomel or other e which is inserted in the electrolyte during an electrodeposition reaction, and is used to measure the potential at which this occurs **calomel-** See (1) *calomel e* (2) *Hildebrand e* **capillary-** See *Lippmann e* **dropping-** A standard e formed by a stream of mercury falling in fine droplets through a capillary tube into the electrolyte A fresh surface is thus obtained continuously Cf

polarograph, Heyrovsky **gas-** See *gas e* **gas-jet-** See *sprudel effect* **glass-** An e produced by a thin glass membrane separating solutions of known and unknown pH value, the potential difference between the two sides being measured and used to determine the pH value of the unknown **Hildebrand-** q v **hydrogen-** q v **negative-** The cathode, negode, or negatively charged pole, by which the "current passes out" **positive-** The anode, posode, or positively charged pole by which the current enters **quinone-** q v **reversible-** An e which owes its potential to ionic changes of a reversible nature, as $H_2 \rightleftharpoons 2H^+ + 2e^-$

e potential The tendency, expressed electrically as volts, of a metal to dissolve in a solution containing its ions The algebraic difference of the two e p of the electrodes gives the voltage, E, of the cell

$E = E_0 + 2\,3026 \frac{RT}{nF} \log_{10} C$, where E is the electrode potential for a concentration C, in gram-ions per liter of the ions given off by the electrode, E_0 the electro-affinity, R the gas constant, T absolute temperature, n the valency of the ion, and F one faraday—96450 coulombs

Or $E = E_0 + \frac{0\,058}{n} \log C$

electrodeposition The precipitation of a metal on an electrode, as, in electrorefining, q v, electrowinning, q v, electroplating, q v, and electroforming, q v

electroanalysis The quantitative electrodeposition of an element from a solution The electrode is weighed before and after deposition to obtain the amount of the element present originally

electrodynamics A branch of practical physics dealing with moving charges e g, an electric current

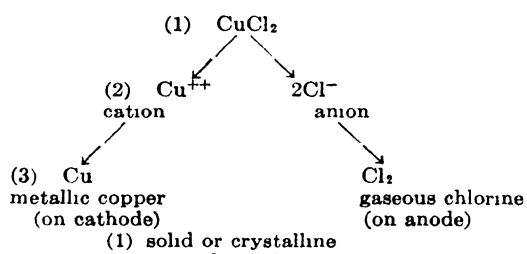
electrodynamometer An instrument for measuring the intensity of faradic and alternating currents

electro-endosmosis The production of endosmosis (q v) by an electric potential

electroforming The production of metallic tubes or sheets, or the reproduction of patterns by electrolysis

electrographic analysis The metal to be tested is made the anode or cathode and placed in contact with paper impregnated with a reagent giving a color reaction with the metal to be detected Any other suitable metal may be used as electrode on the other side of the paper

electrolysis The local and spacial separation of the ions of an electrolyte and the transfer of their respective charges, hence, the decomposition of a compound, either liquid, molten, or in solution, by an electric current, *E g*,



Cf *electrochemical decomposition* **internal-** The separation of a metal in the presence of a much more electropositive (*i e* baser) metal, by inserting an anode of the baser metal in the solution, and connecting it directly with a platinum cathode on which the metal is deposited No external current is required *E g*, Cu on Zn immersed in $CuSO_4$ solution

electrolyte (1) Any substance which dissociates into two or more ions, to a great or small extent, when dissolved in water Solutions of e thus conduct the electric current and are decomposed by it (*electrolysis*, q v) (2) Battery acid Sulfuric acid, d 1 150–1 835, used in batteries and accumulators **non-** Substances which do not dissociate into ions **strong-** E which are highly-dissociated even at moderate dilutions, and do not obey Ostwald's dilution law **weak-** E which are fully or partly dissociated only at high dilution, they obey the dilution law

electrolytic Pertaining to decomposition by an electric current **e apparatus** A set of instruments for quantitative electro-deposition It consists of an ammeter, voltmeter, rheostat platinum anode, and a device for rotating the anode **e dissociation** Ionization **e gas** A mixture of hydrogen (2 vol) and oxygen (1 vol) obtained by electrolysis of water **e potential** Electro-affinity **e separation** The graded separation by electro-deposition (q v) of metals from a solution, by varying the applied electrolytic potentials according to the respective electrode-potentials of the metals **e solution tension theory** Nernst theory

electrolyze, electrolyse To decompose by electrolysis

electromagnet A piece of soft iron around which is wound an insolated wire so long as the electric current passes through the wire, the iron has magnetic properties

electromagnetic Pertaining to electricity and magnetism **e field** The area of force surrounding an electro-magnet or a conductor through which a current flows The intensity, H, of the magnetic field at the center of a circular conductor of radius, r, is $2(\imath/r)$, where $\imath$ is the current **e law** See *Coulomb* **e radiation** See *radiation, ray, waves* **e separation** The separation of the magnetic constituents of ores by means of an electromagnet **e units** e m u or "emu" A system of electrical units based upon dynamics, it includes the practical units (volt ampere, ohm, etc) which are multiples or fractions of the c g s electro-magnetic units See table of electrical units

electromerism A mobile electron tautomerism shown by a set of compounds in which the electron constellations vary, although the atomic kernels remain in position Cf *chelate bond*

electromers Isomers which differ in the distribution of the electrons amongst their atoms

electrometer An instrument for measuring the quantity or intensity of an electric current **absolute-** Galvanometer Ammeter **capillary-** An e used as a null-instrument which detects potentials down to 1 millivolt by the motion in a capillary tube of a dilute sulfuric acid-mercury interface The motion is due to a change of surface tension produced by the potential **emanation-** See *emanation* **photo-** Photo-galvanometer **quadrant-** Galvanoscope

electromotion Mechanical action produced by electricity

electromotive In motion produced by electricity **e force** E, EMF, emf or E M F, or e m f, electrical pressure, voltage The work done per unit quantity of electricity flowing through a cell, *i e*, the driving force behind the electrons comprising a current A potential gradient is set up between any two elements, especially metals, placed in a solution, which can be expressed by e m f = volts = I/R = amperes/ohms If the elements and ions are arranged according to decreasing e m f, the displacement series (q v) results, this measures the capacity of an atom to retain its electrical charge or hold its negative valence electrons The unit of e m f is the volt

1 International volt = 1 00043 absolute volt
1 absolute volt = 0 99957 international volt
= 1 practical e m u
= 10^8 c g s e m u
= 0 0033349 e s u

For molar concentrations the e m f of an electrolytic cell is the algebraic difference between the electro-affinities (q v) of the ions of the metals forming the electrodes See *electrode potential* **e series** Displacement series

electron (1) An alloy containing about 90 % magnesium, 5 %, aluminum and a little zinc, manganese or copper (2) Negatron, beta-particle An elementary unit of electricity, or a negatively charged corpuscle, whose accumulation on an insolated conductor causes the phenomena of static electricity, and whose flow through a conductor produces an electric current Electrons are constituents of the atom, they are assumed to be in the atomic nucleus and the atomic shell, and their number and the arrangement of the outer electrons accounts for valency and other properties of the atom Electrons are liberated from the atom by radioactive disintegration, and transferred from one atom to another in oxidation-reduction reactions (electronation) They are made visible by the Wilson track method, and Millikan's fog chamber Their mass changes with their velocity Constants are

mass	$9\,035 \times 10^{-28}$ gm
charge	$4\,770 \times 10^{-10}$ e s u
	or
	$1\,591 \times 10^{-20}$ e m u
spin (angular momentum)	$9\,02 \times 10^{-28}$ erg sec

Cf *e*, *e/m*, *atom*, *quantum*, *Bohr*, *Schrodinger* **binding-** An electron which holds together the positive charges in the atomic nucleus **cementing-** An electron which is assumed to hold together the two hydrogen nuclei of the helium atom **free-** (1) A corpuscle or charge of negative electricity (mass $9\,01 \times 10^{-28}$ gram), equal to 1/1845 the mass of a hydrogen atom (2) An e in the octet of an atom which is not shared by another atom, thus the N in ammonia has two, and the O in water four free e which can form co-ordinate bonds **heavy-** Yukawa particle A penetrating component of cosmic rays, believed to carry an electronic charge greater than that of an electron, but less than that of a proton **lodged-** A singular position of electrons in equilibrium in the atom, as opposed to binding electrons which are supposed to occur in couples or pairs **metastasic-** An electron which changes its position within the atom due to radioactive changes They are generally valence electrons moving from the valence orbit into the interior of the atom **negative-** Negatron or a free electron Cf *positive e* **nuclear-** E of the atomic nucleus **orbital-** E in the orbits of an atom **paired-** A couple of e which constitute a non-polar bond, q v Cf *twin e* **phoretic-** E which produce electrical conduction by passing freely from atom to atom when their outer orbits are in contact **photo-** E liberated from a surface by exposure to visible or invisible light **piezo-** A supposedly disk-shaped e in the helium nucleus **positive-** (1) A heavy, but very small corpuscle which is never found associated with a mass less than that of hydrogen, and which is assumed to be a hydrogen nucleus or a hydrogen atom from which an electron has been removed (hydrogen ion or proton) (2) Positron A particle (q v) of nearly zero mass with a positive charge **recoil-** E which are scattered by bombardment of a substance with α- or β-rays **twin-** A couple of e which constitutes a polar bond, q v Cf *paired e* **valency-** The electrons located in the outer shell or orbit of the atom which are responsible for valency, and which may either pass from one atom to the other (polar bond) or be held in common by two atoms (non-polar bond) The number of valence electrons ranges from 1 to 8 (see *periodic system*), and an atom with 1 electron (alkali metals) is positive and monovalent, an atom with 2 electrons (earth-alkalis) positive and divalent, an atom with 3 electrons (earth-metals) positive and trivalent, an atom with 4 electrons (carbon group) non-polar and tetravalent, an atom with 5 electrons (nitrogen group), negative and trivalent, an atom with 6 electrons (oxygen group), negative and bivalent, an atom with 7 electrons (chlorine group) negative and monovalent, an atom with 8 electrons (noble gases) inert and non-valent The term "positive" indicates the loss and "negative" the gain of an electron or electrons See *Lewis-Langmuir theory*, *octet theory*, *valency*, *bond*

e affinity The capture by a substance, *e g*, an oxidizing agent, of the electrons of other substances See *electronation* **e attraction** The pull exerted by an atom or radical on the shared electron-pair, which joins it to some other atom or radical See *e formula*, *Lucas theory* **e beam** A stream of *e*, as in a cathode tube See *sectrometer*, *Wilson tracks* **e diffraction** The investigation of the structure of a surface by the diffraction of a stream of electrons directed upon it Cf *Kikuchi lines*, *electron microscope* **e displacement** A shift of an e pair held in common between two atomic nuclei, towards one of the nuclei See *Lucas theory* **e eye** Iconoscope **e formula** A chemical notation which depicts the displacement of the e s in an organic compound The relative orbital position of the e pair is represented by the symbols o—, —o—, —o—, each circle represents two electrons **e fugacity** The tendency to lose electrons by an electrode immersed in a solution **e lens** The electrostatic field surrounding an aperture in a charged conductor, thus a circular hole will focus electrons according to, $f = 2V/(G_2 - G_1)$, where f is the focal length, V the energy of incident particles in volts and

G_1, G_2 the potential gradient on the two sides of the plate The diameter of the hole is not involved **e microscope** See *microscope* **e optics** The study of the control of the motion of electrons by means of charged electric fields, in a manner analogous to the effect of lenses on light **e pair** A couple of electrons which is held in common by two atoms, and accounts for a non-polar and non-ionizable bond **e replacement** (cf *displacement*) Electronation **e screening effect** See *screening effect* **e transfer** The passage of one or more electrons from an atom or iron to another atom or ion during an oxidation-reduction reaction, q v Cf *polar number, valency* **e tube** A device for an electric discharge, as, thermionic valve, vacuum tube, radio tube, x-ray tube or rectifier **e volt** EV Volt of energy or equivalent volt = $1\ 59 \times 10^{-12}$ erg It is the energy acquired by an e when it falls through a potential of one volt, and is related to wavelength (cf *quantum mechanics, radiation*) as follows

1	EV	= 12,337	a
4 3EV		= 2,900	å
6 4EV		= 2,000	å
10	EV	= 1,250	a
25	EV	= 500	å
100	EV	= 12 3å	

electronate To cause electronation or reduction **de-** To cause de-electronation or oxidation

electronating agent A substance which loses one or more electrons during a chemical reaction **de-** A substance that gains one or more electrons during a chemical reaction

electronation A general term proposed by Cady and Taft for reduction, or the addition of an electron or electrons to an element during a chemical reaction **de-** Oxidation, or the removal of an electron or electrons from an element during a chemical reaction *E g*

Electronated or reduced from +1 to 0

$$A^+ + B = B^+ + A$$

De-electronated or oxidized from 0 to +1

A^+ is the de-electronating or oxidizing agent, as its valence number decreases from (+1) to 0 B is the electronating or reducing agent, as its valence number increases from 0 to (+1)

Electronated or reduced from 0 to −1

$$C + D^- = D + C^-$$

De-electronated or oxidized from −1 to 0

C is the de-electronating or oxidizing agent, as its valence number decreases from 0 to (−1) D^- is the electronating or reducing agent as its valence number increases from (−1) to 0 **e. reactions** Oxidation-reduction reactions, or all chemical reactions in which an exchange of electrons takes place, hence, any reaction in which the valences of the elements are increased or lowered Classification

(a) oxidation and reduction
(b) nitridation and denitridation
(c) chlorination and de-chlorination
(d) bromination and de-bromination
(e) sulfidation and de-sulfidation
(f) cyanation and de-cyanation

electronegative (1) Having a negative charge or an excess of electrons (2) Capable of capturing electrons **e element** An element located on the left side of the periodic table, especially the non-metals (upper half of the periodic table) Its atom has four or more valence electrons and has a tendency to complete its quota of eight **e ion** Anion, or negative ion **e radical** An acid radical or a group of atoms having a negative charge, as, OH^-, SO_4^{--}

electronic Pertaining to electrons **e charge** A quantity (e) of electricity which is numerically equal to the charge on an electron $e = (4\ 770 \pm 0\ 005) \times 10^{-10}$ absolute e s u **e formula** See *formula* **e mass** The mass (m) of a negative electron when moving with a velocity much less than that of light **e number** The number of peripheral electrons present in the elements making up a compound **e ratio** The ratio of electronic charge to electronic mass,

$$e/m = 5\ 305 \times 10^{17} \text{ e s u} = 1\ 769 \times 10^7 \text{ e m u}$$

e structure symbol A notation showing the distribution of electrons in the molecule, see *bonds, molecular diagram*

electronyl A term for the atomic entity which is active by virtue of the number of electrons in excess of or less than the nuclear charge

electroösmosis The diffusion of a substance through a membrane within an electric field

electrophoresis The migration of particles in an electric field

electrophorus Insulated discs of ebonite and brass, used to produce frictional electricity

electroplating The formation of a metallic coat on a baser metal by electrolysis, hence, any electrolytic process for covering a metallic object with a fine deposit of silver, gold, nickel, copper, or chromium

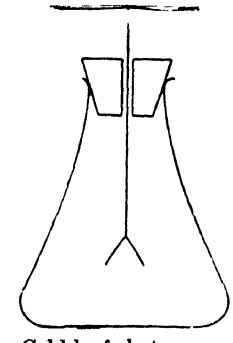
electropositive (1) Having a positive charge or a deficiency of electrons (2) Capable of losing or giving up electrons **e elements** The elements on the right-hand side of the periodic table especially the light-metals (upper half of the periodic table) **e ion** Cation An atom which has lost one or more negative electrons and has become positive **e radical** A basic radical or a group of atoms having a positive charge, as, NH_4^+, $Cu(NH_3)_4^{++}$

electropotential Electrode-potential

electrorefining The purification of metals, especially copper, nickel, or tin, by electrolysis

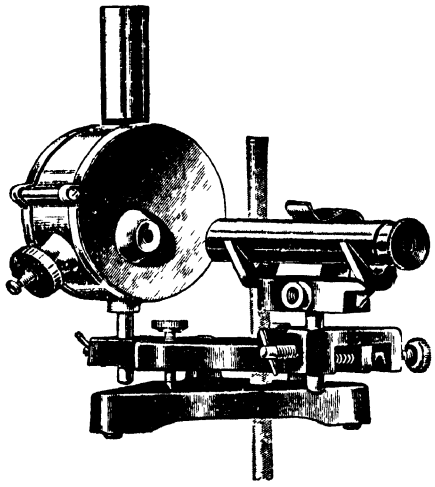
electroresponse. The increase in resistance shown by certain cells with increase of current Such cells may contain cuprous oxide and sodium silicate, and are used as automatic cut-outs for lighting systems

electroscope A device for detecting electrical charges or gaseous ions Cf *Curie, emanation, radioscope* **gold-leaf-** Two strips of gold leaf suspended from an insulated conductor and



Gold-leaf electroscope

enclosed in a glass vessel **measuring-** An insolated gold leaf mounted in a closed case having an adjustable insulated plate which can be rotated so that an electrostatic and



Measuring electroscope

gravitational balance is established The position of the leaf is read in a low focus microscope

electroscopy The measurement of the degree of ionization of a gas in terms of the rate of fall of the leaf of a charged gold electroscope

electrosol A colloidal solution of a metal obtained by passing electric sparks between metal electrodes immersed in distilled water See *collosol*

electrostatic Pertaining to electric charges at rest, as, the accumulation of electrons or an electric field of force **e capacity** The ratio of quantity of electricity to difference of potential **e law** See *Coulomb* **e units.** Esu or e s u A system of electrical units based on static data See table under *electrical*

electrostenolysis The precipitation of metals within the pores of a membrane by electrolysis

electrostriction (1) The contraction of the solvent of a solution resulting from the attractions of the water dipoles by the ions of the solute (2) Mechanical deformation due to the application of an electric charge, the reverse of piezoelectricity

electrosynthesis Synthetic reactions caused by an electric current, especially those used in organic synthesis

electrotaxis Electrotropism The movement or motion of living cells caused by an electric current

electrotropism Electrotaxis

electrotrotyping The reproduction of type, reliefs, etc by copper-electro deposited on the layer of graphite with which the mold or object has been covered

electrovalence A fundamental type of atomic linkage corresponding with ionised or polar linkages, and opposed to covalency It is due to the transfer as distinct from sharing of electrons Cf *polar, non-polar bonds*

electrowinning The separation of metals (as zinc or copper) from their ores by electrolysis Cf *electrorefining*

electrum (1) Amber (2) An alloy of 80 % gold and 20 % silver, d 13 0–16 0, hardness 2 5–3 0

elemecin $C_{12}H_{16}O_3$ = 208 10 *3 4 5*-Trimethoxy propenyl benzene, iso-elemicin, $C_6H_2(OMe)_3C_3H_5$ An aromatic ether d 1 073, b 153, from elemi

elemene $C_{15}H_{24}$ = 206 2 A hydrocarbon, d 0 883, b_{10mm} 119, from elemi

element Matter which consists of atoms of one type, hence, a substance which cannot be further decomposed by chemical means, a chemical unit or an ultimate constituent of matter There are 92 possible elements from hydrogen to uranium, inclusive The atoms of an element are chemically alike but may differ physically, hence an e may consist of a mixture of two or more atoms of different mass which have similar chemical properties but different atomic weights (isotopes) An element, while chemically undecomposable, may consist of two or more isotopes, and the atomic weight is the mean of the atomic weights of the isotopes calculated in the proportion of the amounts of the individual isotopes present The elements of higher atomic weight are radioactive, indicating their complex nature (subatomics) **abundance of-** See *abundance* **alkaline-** E of the first group of the periodic system, Li, Na, K, Rb, and Cs **basylous-** E of the first, second, and third groups of the periodic system, located in the upper right half of the periodic table, whose oxides form bases with water **bio-** See *bioelements* **bridge-** E in the lower half of the periodic table, especially those of the rare earth metals, which show a gradation of properties from one to the other **Bunsen-** *Bunsen cell* **chemical-** Element **dvi-** See *dvi-* **electrical-** Galvanic, or voltaic cell **earthy-** E of the third group of the periodic system, *e g* , Al, Sc, etc **eka-** See *eka element* **electrical-** An electrolytic cell **electronegative-** E whose atoms have more than four valency electrons They are located on the left of the periodic table **electropositive-** E whose atoms have less than four valence electrons They are located on the right in the periodic table **extinct-** The supposed e of very low atomic weight, which may have formerly existed on the earth but have become extinct on account of the age of the earth, *e g* , nebulium, a hypothetical constituent of certain planetary nebulæ giving characteristic spectral lines which seemed to indicate a low atomic weight but which are now considered due to oxygen and nitrogen **future-** The hypothetical e of very high atomic weight which may in future appear on our earth on account of evolutionary processes and gradual condensation (Cf *old age theory, hypon, trans-uranium*) **gaseous-** E which are, under normal conditions, in the gaseous state H, O, N, Cl, F, and the noble gases **group-** E belonging to the same group in the periodic system, as opposed to period-elements **haloid-** E of the seventh group of the periodic table F, Cl, Br, and I **heating-** A unit of resistance wire used in heating apparatus **inert-** E of the zero group of the periodic table, (the noble gases He, A, Kr, Xe, and Nt), which are electrically inert, and of which very few compounds are known **liquid-** E which are in the liquid state under normal conditions, bromine and mercury **metallic-** E of the lower half and right upper half of the periodic table, the light-metals, and heavy-metals **negative-** Electronegative- **non-metallic** E

located in the left upper half of the periodic table, q v **normal-** Standard cell **period-** An e whose properties are closely related to the e s of the same period of the periodic table, *e g*, Mn-Fe-Co-Ni, Rh-Ru-Pd Antonym group element **primal-** The original, nebulous form of matter from which all other elements are supposed to have evolved the protyle, pantagon, or urstoff **principal-** The fourteen most common, most abundant, and most important elements, *viz* aluminum, calcium, carbon chlorine, hydrogen, iron, magnesium, nitrogen oxygen, phosphorus, potassium, silicon, sodium, and sulfur Cf *abundance* **radio-** Any e made artificially radioactive by bombardment with particles, as, radiosodium, radionitrogen **radioactive-** Those e of atomic numbers 82 to 92 **terminal-** E of the zero-group of the periodic system which form the terminals of each period, *i e*, the noble gases or inert elements **transition-** (1) E of the fourth group of the periodic system which form the transition from light-metal to non-metal light-metal to heavy metal, and heavy-metal to non-metal, *i e*, elements of the carbon group (2) The triads Fe, Co, Ni, Ru Rh, Pd and Os, Ir, Pt which connect the seventh and first group (3) The e from Ti to Ni, Zr to Pd and Hf to Pt which connect the A series in the periodic system **typical-** The e s of the second period of the periodic system, which show the typical characters of each group —neon, sodium, magnesium, silicon, phosphorus, sulfur and chlorine

Note

For alphabetical list of elements giving *atomic weights* and *atomic numbers*, see *atomic weight*

For numerical list of atomic numbers including *valency* and *atomic structure* of elements, see *periodic chain*

See also *ions, ionic numbers, radioactive elements,*

For a list of *isobars, isotopes*, see *abundance, displacement series, isomorphs*

HISTORICAL TABLE

Prehistoric and Archaic Time		
	carbon	
	sulfur	
	gold	
	silver	
4000 B C	copper (Egypt)	
3500 B C	iron	
?	lead	
1600 B C	tin (Chaldaea)	
1000 B C	antimony	
300 B C	mercury (Theophrastus)	
Alchemistic period		
1220	arsenic	Albertus Magnus
1450	bismuth	Basil Valentine
1520	zinc	Paracelsus
1669	phosphorus	Brand
Beginnings of Chemistry		
1733	cobalt	Brandt
1750	platinum	Wood
1751	nickel	Cronstedt
1758	sodium in salts	Marggraf
1758	potassium in salts	Marggraf
Founding of Chemistry		
1766	hydrogen	Cavendish
1772	nitrogen	Rutherford
1774	oxygen	Priestley
1774	chlorine	Scheele
1774	manganese	Scheele, Gahn
1774	barium	Scheele
1782	tellurium	Muller
1782	molybdenum	Hjelm
1783	tungsten	d'Elhujar
1787	strontium	Cruikshank
1789	zirconium	Klaproth
1789	uranium	Klaproth
1789	titanium	Gregor
1794	yttrium	Gadolin
1797	chromium	Vauquelin
1797	beryllium	Vauquelin
1801	columbium	Hatchett
1802	tantalum	Ekeberg
1803	cerium	Klaproth
1803	osmium	Tennant
1803	iridium	Tennant
1804	palladium	Wollaston
1804	rhodium	Wollaston
Beginnings of electrochemistry		
1808	calcium	Davy
1808	magnesium	Davy
1808	boron	Davy
1812	iodine	Courtois
1817	selenium	Berzelius
1817	lithium	Arfvedson
1817	cadmium	Strohmeyer
1823	silicon	Berzelius
1826	bromine	Balard
1828	aluminum	Wohler
1828	thorium	Berzelius
1830	vanadium	Sefstrom
1839	lanthanum	Mosander
1841	(didymium)	Mosander
1843	erbium	Mosander
1845	ruthenium	Claus
Beginnings of spectroscopy		
1860	cesium	Bunsen
1861	rubidium	Bunsen
1861	thallium	Crookes
1863	indium	Reich, Richter
Beginnings of systematization		
1872	(eka-elements)	Mendeleyeev
1875	gallium	Boisbaudran
1878	terbium	Delafontaine
1878	ytterbium	Marignac
1878	holmium	Soret
1878	thulium	Cleve
1879	samarium	Boisbaudran
1879	scandium	Nilson
1880	gadolinium	Marignac
1885	praseodymium	Welsbach
1886	dysprosium	Boisbaudran
1886	neodymium	Welsbach
1886	germanium	Winkler
1886	fluorine	Moissan
Modern Chemistry		
1894	argon	Ramsay and Rayleigh
1895	helium	Cleve, Ramsay
1898	neon	Ramsay and Travers
1898	krypton	Ramsay and Travers
1898	xenon	Ramsay and Travers
(radioactivity)		
1898	polonium	Curie
1898	radium	Curie
1898	actinium	Debierne, Giesel
1898	radon (niton)	Curie, Dorn
1900	europium	Demarcay
1907	lutecium	Urbain, Welsbach
1913	brevium	Fajans
(mass-spectrograph)		
1923	hafnium	Coster and Hevesy
1925	masurium	Noddack and Tacke
1925	rhenium	Noddack and Tacke

HISTORICAL TABLE—(*Continued*)

1926 illinium (magneto optic method)	Hopkins
1930 virginium	Allison and Murphy
1931 alabamine (neutron bombardment)	Allison, etc
1935 ekarhenium	Rolla
1935 ekaosmium (artificially produced)	Rolla
1936 ausonium (No 93)	Fermi
1936 esperium (No 94) (chemically isolated)	Fermi

elementary (1) Ultimate, simple, fundamental (2) Pertaining to elements **e analysis** The determination of carbon and hydrogen in organic compounds Cf *analysis* **e charge** The charge on an electron, e = 4 770 × 10^{-10} e s u **e molecule** A combination of similar atoms, as, O_2 or S_4 **e space** The space surrounding the positively charged nucleus in which the electrons are arranged in definite positions Cf *dynad*

el-mentide A group of atoms or elements which are transferred as whole complexes during a chemical reaction

elemi (1) Gum elemi A soft, white or yellowish, aromatic resin from *Canarium commune*, a Burseraceae of the Philippines Used in pharmacy in plasters and ointments, or to impart toughness to varnishes Cf *nauli gum* (2) Originally the resin of *Amyris elemi fera* **e oil** An essential oil, d 0 870–0 910, from e containing dipentene

elemic acid $C_{35}H_{56}O_4$ = 540 6 A colorless, crystalline acid derived from elemi

elemicin $C_{12}H_{16}O_3$ = 208 1 *1*-Allyl-*3 4 5*-trimethoxybenzene A colorless liquid, d 1 063, b 144, from elemi oil **iso-** Elemecin

elemin $C_{40}H_{68}O$ = 564 7 A crystalline resinous substance in elemi

elemol $C_{15}H_{26}O$ = 222 2 A camphor from elemi, *α-* m 46, b $_{10mm}$143, d 0 941, *β-* b $_{10mm}$144, d 0 943

elemonic acid An acid, m 220 5, from elemi

eleonorite $Fe_6P_4O_{19}\,8H_2O$ A hydrous iron phosphate occurring in brownish, rhombic masses, d 2 52–2 59, hardness 7

eleoptene The liquid terpene or hydrocarbon of an essential oil, as compared with the solid part or stearoptene

eleostearic acid $C_{18}H_{30}O_2$ = 280 27 Elaeomargaric acid octadeca-*9 11 13*-trienoic acid* $Me(CH_2)_7(CH{:}CH)_3(CH_2)_3COOH$ An unsaturated, aliphatic, monobasic acid from the oil of the seeds of *Elaeococca vernicia* Colorless rhombic scales, *α-* m 48, *β-* m 71, insoluble in water soluble in alcohol or ether Both, *α-* and *β-* occur in tung oil *ε-* Couepic acid A solid, m 75, from the fat of the seeds of *Couepia grandiflora*, a Rosaceae of South America

elevation (1) Anything which projects or rises above the surrounding surface, *e g*, altitude (2) A rise or increase, as the elevation of temperature

d'Elhujar, Juan José and **Fausto** de Elhuyar, de Luyart Two Spanish chemists, brothers, who discovered ceria and tungsten (1783)

elimination The expulsion or excretion of waste materials from the body

eline El = 218 (?) Ekaiodine A supposed halogen element, atomic number 85, occurring as a black metallic solid or as brownish crystalline masses, d 5 9 (?), m 360 (?), b 430 (?), insoluble in ordinary solvents It is widely distributed, but in small quantities, and is found in the water of Great Salt Lake and in some deserts oils of Western U S **e chlorides** El_xCl_y White waxy masses or crystalline fibres, soluble in water, alcohol or ether **e nitrate** $ElNO_3$ (?) A yellowish white solid, soluble in water or carbon tetrachloride **e sulfate** $El(SO_4)_2$ (?) A white, hygroscopic solid, soluble in water, alcohol or ether

elinvar An alloy of Fe, Ni and Cr, used in the manufacture of hair-like watch springs [*elasticity invar*iable]

elixir (1) A liquid pharmaceutical preparation for the administration of drugs in an attractive and pleasant form They are usually sweetened and aromatized alcoholic liquids or cordials (2) In alchemical language, the principle of everlasting life and youth, and the means of converting the baser metals into gold, (philosopher's stone)

elkerite Pseudofucosan A native bitumen formed by the slow oxidation of crude oil It is a fucose pentosan Cf *fucosan*

ellagic acid $C_{14}H_6O_8$ = 302 05 Gallogen A yellow, odorless, tasteless, crystalline powder, $d_{18°}$ 1 667, decomp on heating, insoluble in ether, sparingly soluble in hot water or alcohol Soluble in alkalis It occurs in many tannins, as, myrobalans, dividivi and valonia

ellagitannic acid $C_{14}H_{10}O_{10}$ = 338 1 A tannin-like substance extracted from the pods of *Caesalpinia coriaria*, a Leguminosae, and the root bark of *Punicia granatum*, a Punicaceae, slightly soluble in water

Elliot tester An apparatus for determining the flash-point of illuminating oil

elliptone $C_{20}H_{16}O_6$ = 352 0 A toxic constituent of Derris root (*D elliptica*)

elm bark Ulmus, elm bark, slippery elm The bark of *Ulmus campestri* or *U fulva*, an Urticaceae, used as demulcent, and an adulterant for cassia Cf *ulmin, ulmic acid*

elpidite $Na_2ZrSi_6O_{15}\,3H_2O$ A reddish, pearly, sodium zirconium silicate, d 2 5, hardness 7

elscholtzaldehyde $C_6H_6O_2$ = 110 06 *3-*Methyl-*2-*furaldehyde Me C_4H_2O CHO from *Elscholtzia* species, a Labiatae

elscholtzic acid $C_6H_6O_3$ = 126 06 *3-*Methyl pyromucic acid The acid Me C_4H_2O COOH, from *Elscholtzia* species Labiatae

eluant A liquid used for the extraction of one solid from another, *e g*, in chromatography, q v

eluate The solution resulting from elution

elution A process of extracting one solid from another

elutriation The process of washing and separating suspended particles by decantation

elwotite A hard alloy of tungsten containing not more than 30 % titanium

Em The symbol for emanation (see *radon*)

em The c g s -electromagnetic unit of the quantity of electricity

eman A radioactive unit for the Rn content of the atmosphere 1 eman = 10^{-10} curie per liter Cf *mache unit*

emanation Em An element, atomic number 86, consisting of the isotopes radon, thoron and actinon A gaseous disintegration product of radio-active substances **actinium-**, AcEm, Actinon An isotope of radon, a disintegration product of AcX, and the parent-substance of AcC' **radium-**, RaEm, radon, Rn Disintegration product of radium and the parent-

substance of RaC' **thorium-**, ThX Thoron An isotope of radon The gaseous disintegration product of ThX, and the parent-substance of ThC' See *radioactive isotopes*

e electrometer A delicate electrometer for detecting radio-activity in substances, such as spring water or minerals **e electroscope** An electroscope designed by Rutherford for measuring the amounts of emanation from radio-active bodies

emamium An early name for actinium

Embden ester A glucose-phosphoric acid ester formed in muscle during muscular activity

embedding The fixing of tissues in a solid material (*e g* , paraffin) so that they can be cut into thin sections **e bath** A device for heating paraffin and placing tissues in the molten liquid **e oven** An incubator with drawers

embeliate A salt of embelic acid

embelic acid $C_{18}H_{28}O_4 = 308\ 22$ Embelin, embellic acid The active principle, m 142, from the berries of *Embelia ribes*, a Myrsinaceae, used medicinally against tapeworms

embelin Embelic acid

embellic acid Embelic acid

embolite 2AgBr 3AgCl A rare silver chloride-bromide occurring as grayish mases, d 5 8, hardness 1 5

embryology The branch of biology which deals with the development of an organism from a single cell or fertilized egg up to its stage of independent life

embutal Pentobarbital

emerald A green variety of beryl, used as a precious stone **oriental-** A green variety of corundum **e green** Copper aceto-arsenite

emergent column The portion of the thread of a thermometer which is not immersed in the substance whose temperature is being measured A correction for its contraction is given (for mercury in glass) by $N(T - t) \times 0\ 000156$, where N is the number of degrees on the emergent stem, T the temperature as read, and t the temperature at a point half-way up the emergent column as given by a second similar thermometer

emeri Emery

Emerson calorimeter A device for rapidly testing the heat value of coals or fuel oils

emery A dark, impure variety of crystalline corundum mixed with oxides of iron, used in powder form as a polishing, grinding, and abrasive material **e cloth** An abrasive fabric coated with glue and emery **e paper** A paper coated with glue and emery, used in place of sand paper

emetamine $C_{29}H_{36}O_4N_2 = 476\ 29$ An alkaloid from ipecac Colorless crystals, m 156

emetic A drug which causes vomiting, used especially in cases of poisoning, *e g* , any one of the following taken in warm water

	(8 oz)	250	cc
Mustard powder	1 tablespoon	15	gm
Common salt	2 tablespoons	30	gm
	(4 oz)	125	cc
Zinc sulfate	30 grains	2	gm
Copper sulfate	5 grains	0 3	gm
Ammonium carbonate	30 grains	2	gm

mechanical- Causing vomiting by tickling the throat with a feather

emetine $C_{30}H_{40}O_5N_2 = 508\ 26$ An alkaloid related to cephaeline from the root of *Cephaelis ipecacuanha*, ipecac Colorless, transparent crystals, or white powder, m 74, sparingly soluble in water, soluble in alcohol or chloroform Used medicinally as a specific against ameba, especially in hypodermic medication **iso-** $C_{29}H_{44}O_4N_2 = 480\ 32$ An alkaloid from ipecac, m 98 **e hydrochloride** $C_{30}H_{40}O_5N_2 \cdot 2HCl = 581\ 26$ A white crystalline powder, m 53, soluble in water or alcohol, used hypodermically similarly to emetine

emetoid A ten per cent trituration of the alkaloids of ipecac, containing emetine and cephaeline hydrochlorides, used as an expectorant and eliminant

emf or **E M F** Abbreviation for electromotive force

emission The liberation or sending out of energy by a substance as radiations from atoms, heat from bodies Cf *scattering, line* **e spectrum** See *spectrum*

emitron An electron-tube (q v) used in television

emmenagogue A drug which produces or increases menstrual flow, *e g* apiol, ergot quinine, cotton root bark, oil of savin

emmenin A crystalline female sex hormone related to oestrone

emmer A variety of wheat which was formerly very abundant in Central Europe and the Near East

Emmerling tube A glass cylinder filled with glass beads, used for the absorption of gases by liquids

emodin $C_{15}H_{10}O_5 = 270\ 09$ *1 3* 8-Trihydroxy-6-methylanthraquinone An anthraquinone derivative occurring in many *Rhamnus* species, the purgative principle of rhubarb, aloe, senna, etc Orange colored, monoclinic prisms m 234, sparingly soluble in water, soluble in glacial acetic acid, used as a purgative **aloe-** 1 9-dioxy-3-carbinolanthraquinone An isomer of emodin and constituent of aloes, found in cascara, senna and frangula, it is related to chrysophanic acid and rhein

emollient A drug applied externally to soften or soothe irritated or tense skin *e g* , zinc stearate, boric acid, bismuth subnitrate, talcum

empiric Knowledge which is gained by experience, without theoretical considerations Cf *scientific*

empirical formula A chemical formula which shows the number and variety of atoms, but does not indicate the way in which the atoms are linked together, *e g* , $Fe_6S_3O_{12}$ is the empirical formula for $Fe_2(SO_4)_3$

emplastrum An adhesive plaster

emplectite $CuBiS_2$ A native, copper, bismuth sulfide occurring in grayish metallic masses d 6 4, hardness 2 5, soluble in nitric acid

empyreal air See *oxygen*

empyreumatic Any odorous substance formed by the destructive distillation of vegetable or animal matter **e oils** The oily liquids produced by destructive distillation of vegetable or animal matter, *e g* , creosote, oil of cade, oil of tar

emu or **e m u** Abbreviation for electromagnetic units

emulsic acid $C_{23}H_{42}O_{10}N_6 = 562\ 8$ An acid substance derived from emulsin

emulsification The process of making an emulsion Thus if two pure immiscible liquids are agitated they form an unstable emulsion To make a stable emulsion, that is, prevent the

droplets from coalescing, an emulsifier, (q v), must be added **de-** The breaking up of an emulsion either by (a) addition of an excess of the dispersed phase, (b) destroying the emulsifying agent, (c) heating, (d) freezing or (e) centrifuging

emulsifier Emulsifying agent A substance used to make an emulsion more stable, as, ammonium linoleate Its action is explained by either

A Surface Tension Theory The e lowers the surface tension and thus lowers the tendency of the droplets to coalesce

B Oriented Wedge Theory The e forms an oriented zone between the two phases

C Viscosity Theory The droplets are surrounded by a viscous film of e

emulsify To make an emulsion

emulsin Synaptase An enzyme contained in almonds, and the seeds of the Rosaceae A white amorphous, albuminous powder soluble in water, and contains 48 7 % C, 7 1 % H, 28 7 % O, 14 1 % N, and 1 25 % S It hydrolyses glucosides to glucose and their other combined substance, as amygdalin to dextrose, benzaldehyde and hydrogen cyanide

emulsion Emulsoid A fluid consisting of a microscopically heterogeneous mixture of two phases, both of which are liquid at ordinary temperatures, *e g*, liquids which do not mix, such as oil and water, and in which one liquid forms minute droplets suspended in the other liquid, *e g*, oil droplets in water, or water droplets in oil Cf *colloids, emulsifier*

emulsoid Emulsion

en (1) Greek prefix meaning in, on, or at (2) A suffix which often indicates a hydrocarbon or cyclic compound, *e g* thiophen (3) A prefix indicating a C C bond, as, enamic, enolic Cf *ene*

enamel (1) A paint which dries with a gloss (2) A vitreous, opaque or transparent glaze, which is fused over metal or pottery, as **grayware-** A mixture of 50 % feldspar, 30 % borax with Na_2CO_3, $NaNO_3$ and cryolite **jewelry-** A mixture of 14 % silica, 20 % boric acid, 10 % $NaNO_3$ and 23 % KNO_3 **white cover-** A mixture of 10–22 % quartz, 18–33 % feldspar, 18–34 % borax, 3–10 % soda, 2–5 % sodium nitrate, 3–17 % cryolite These may be colored with a metallic oxide, generally Pb_3O_4

enamic form The amine form of an imine, which is characterized by the radical >C CH NO—, cf *enimization*

enanthaldehyde $C_6H_{13}CHO$ = 114 1 Heptylic aldehyde oenanthylic aldehyde, heptanal, oenanthal, heptoic aldehyde, oenanthic aldehyde A colorless volatile liquid, d 0 85, b 155, slightly soluble in water, soluble in alcohol or ether Used in organic synthesis

enanthic acid Heptoic acid

enanthic acid Heptoic acid **e aldehyde** Enanthaldehyde **e ether** $C_9H_{18}O_2$ = 158 2 Cognac oil, oenanthylic ethyl-ether, ethyl pelargonate, $C_6H_{13}O C_2H_5$ A colorless oily liquid, insoluble in water, soluble in alcohol or ether Used in organic synthesis and in flavoring extracts

enanthine Heptine

enanthol Heptyl alcohol

enanthotoxin $C_{17}H_{22}O_5$ = 306 17 A poisonous resin from the rhizomes of *Oenanthe* (five-finger root)

enanthyl The monovalent radical, C_7H_{13}—, derived from hexane

enanthylic acid Enanthic acid

enantiomers Optical isomers which are related as object and non-superimposable image Cf *enantiomorph*

enantiomorph (1) A crystal which corresponds with another crystal as an object with its image (2) The opposite optically-active substance, the dextroform is the enantiomorph of the levoform and vice versa

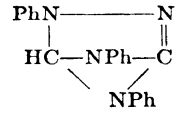
enantiomorphus Related to one another as object and mirror image, as, an optically active substance which crystallizes in enantiomorphs

enantiotropic Existing in two crystal forms, one stable above, the other below a certain temperature (transition point q v)

enantiotropy The phenomena of occurring in enantiotropic (q v), forms

enargite Cu_3AsS_4 Grayish-black, metallic, rhombic crystals, d 4 3–4 5, hardness 3, soluble in nitric acid forming free sulfur

endo- A prefix indicating a "bridge" linkage (or linkage which joins two non-adjacent atoms in a ring) in an organic molecule, *e g*, nitron is an endo-compound of 1 2 4 triazole



endocrine Pertaining to the secretion of ductless glands, as, hormones, q v

endogenous Generated within, or originating within the body **e purines** The purine bodies of excretions, which are the waste products of metabolism Cf *exogenous purines*

endomorph A mineral enclosed within another (the perimorph)

endosmosis The diffusion of a liquid through an organic membrane, *e g*, into a cell Cf *exosmosis*

endothermic The absorption of heat Antonym exothermic **e compound** A compound absorbing heat during its formation, and liberating heat on its decomposition **e reaction** A chemical change which proceeds slowly and absorbs a definite number of calories In an endothermic reaction the stable exothermic compounds are transformed to unstable endothermic compounds

endotoxin The poisonous substances of bacteria which remain within the bacterial cell during its life, but which are set free by autolysis after cell death

endoxerosis The internal decline of a plant

endoxy- A prefix indicating oxygen in a ring

end point (1) That stage in titration at which the reaction is complete (2) The point of balance between two forces

-ene A suffix which indicates (1) a hydrocarbon of the ethylene and benzene series Cf *-diene,-yl* (2) A cyclic compound, as, terpene, menthene (3) A bivalent radical with points of attachment on separate C-atoms, as, ethylene and ethylidene Cf *-idene*

energetics (1) A branch of physics dealing with forces at work (2) A branch of philosophy which denies the existence of matter as a passive inert substance and conceives the universe as arrangements of energies distributed in space

energon An indivisible unit of energy, see *ergon, quantum*

energy Capacity or power to do work and overcome resistance, *e g*, heat, light, electricity,

UNITS OF SPECIFIC ENERGY*

		Meter-gravity, lat 45°	Meter-leo or dynamic meter	Joule / gm	Kw hr / tonne or mw hr / gm	Water-degree C or cal /gm
Potential energy	Meter in London	1 0006	0 9812	$9\ 812\times10^{-3}$	$2\ 726\times10^{-3}$	$2\ 347\times10^{-3}$
	Meter in lat 45°	1	0 9806	$9\ 806\times10^{-3}$	$2\ 724\times10^{-3}$	$2\ 346\times10^{-3}$
	Dynamic meter	1 0198	1	$10\ \times10^{-3}$	$2\ 778\times10^{-3}$	$2\ 392\times10^{-3}$
Kinetic energy	10 meters per sec	5 10	5	0 0500	0 0139	0 0120
Heat	Water 1°C at 20°C	426	418	4 18	1 16	1
	Air at const pressure 1°C	103	101	1 01	0 280	0 242
	Air at const vol 1°C	73	71 5	0 715	0 199	0 171
Latent heat	Water-ice at 0°C	$34\ 1\times10^{3}$	$33\ 4\times10^{3}$	334	93	80
	Steam-water at 100°C	230×10^{3}	226×10^{3}	2260	627	540
Calorific value	Hydrogen (to H_2O)	$12\ 4\times10^{6}$	$12\ 1\times10^{6}$	121×10^{3}	34×10^{3}	29×10^{3}
	Carbon (to CO_2)	$3\ 4\times10^{6}$	$3\ 3\times10^{6}$	33×10^{3}	$9\ 3\times10^{3}$	8×10^{3}
Electrical energy	Kilowatt hours per tonne	367 1	360	3 6	1	0 861

* From F J W Whipple, *Nature*, vol 121, p 356, 1928

chemical action or mechanical energy (See table of *energy units*) It is described as the work done by the force which produces either a change in the velocity of a body or a change in its shape and configuration, or both It can be defined by *force* multiplied by *distance*, or as *one-half mass* multiplied by the *square of velocity* **atomic-** See *atomic* **available-** Free- **chemical-** E involved in chemical changes See *thermodynamics* **conservation of-** The concept that e may be transformed from one form to another, but that it cannot be destroyed or created **creation of-** The concept that e is created when matter is annihilated, as, in the interior of a star Cf *mass-energy cycle* **degradation of-** The tendency for e to be always

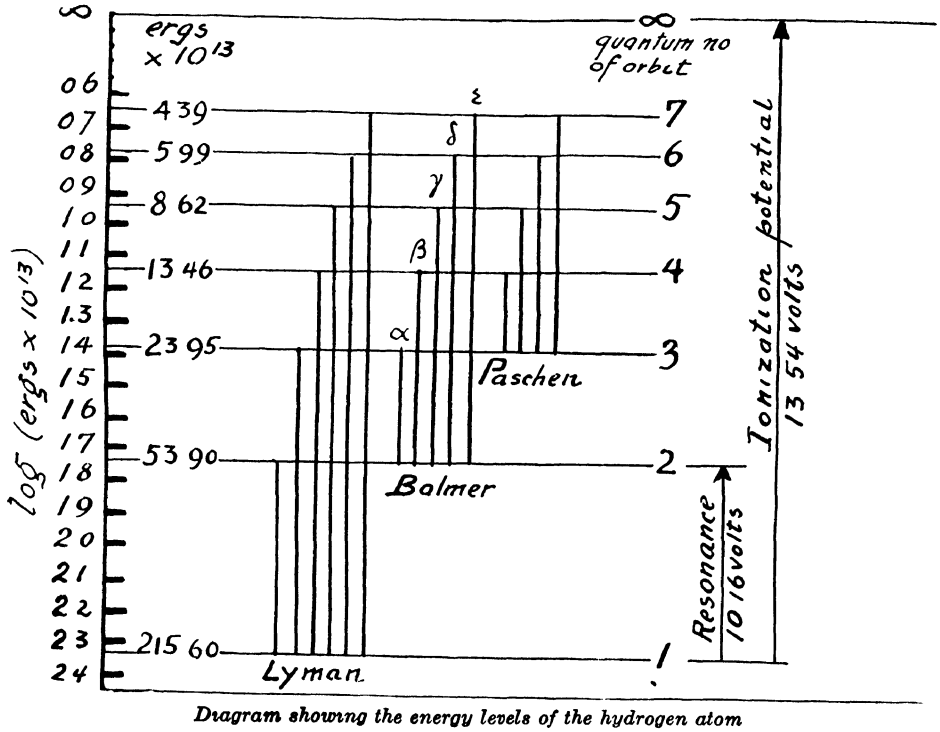


Diagram showing the energy levels of the hydrogen atom

CONVERSION FACTORS FOR ENERGY UNITS
(Smithsonian Physical Tables, p 197, 1920)

	Joule	*Kilogram meter*	*Foot-pound*	*Gram-calories (20°C)*	*Kilowatt-hours*
1 joule (absolute)	1	0 1020	0 7376	0 2390	0 2778 × 10^{-6}
1 kilogram meter	9 807	1	7 233	2 344	2 742 × 10^{-6}
1 foot pound	1 356	0 1381	1	0 3240	0 3766 × 10^{-6}
1 gram calorie	4 184	0 4167	3 086	1	1 162 × 10^{-6}
1 kilowatt hour	3600000	367100	2655000	860300	1

changing to a lower form, *e g*, into heat (Kelvin) **destruction of-** The conversion of e into matter, the reverse of the creation of e Cf *mass-energy cycle* **dissipation of-** Degradation of- **dynamic-** Kinetic **electric-** Electricity **free-** The available e of a substance, the amount of e which can be utilized for work The change in the free e of a reacting substance is a measure of its affinity **ionization-** Ionization potential **kinetic-** The power of a body due to its motion It equals the product of half its mass and the square of its velocity Cf *kinetics, Boltzmann's law* **latent-** Potential e **lattice-** The forces which hold the atoms together in a crystal, q v **mechanical-** E manifesting itself in mechanical work **medial-** The e of a medium or solvent on which its dielectric powers and its powers of ionization, association, tautomerism, etc depend It is related to the latent heat of evaporation **potential-** Static, latent e The e resting unreleased in a body due to its position, composition or condition, as, a lifted weight, an endothermic compound, or a compressed gas **radiant-** See *radiations* **solution-** The e forces between the molecules of solute and solvent Cf *bond, liquids* **specific-** The power of a body due to its relative position (potential e) and motion (kinetic e) See table for units Potential- **thermal-** See *heat*

e change of atom The change of voltage, V, where λ is the wavelength, V = 12,336/λ **e diagram** A figure giving a relative picture of the stationary states of a radiating atom See figure Cf *spectrum, Bohr atom, quantum, hydrogen atom* **e levels** The stationary states or orbits of an atom An electron changing from one to another will either absorb (excitation) or emit (radiation) energy In the e diagram of hydrogen the energy, in 10^{13} ergs, required to cause an electron to change its orbit is indicated by the quantum number, q v, plotted on a logarithmic scale The lines connecting the various levels correspond with the sources of the spectrum lines, *e g*, Lyman, Balmer, and Paschen series Cf quantum numbers See figure **e mass cycle** See *mass energy cycle* **e quanta** See *quantum theory, Stoner quanta* **e units** Units of energy are based upon the work done by a certain force which either produces a change in velocity (= change of kinetic energy), or a change of condition or shape (= change of potential energy), or both The kinetic energy of mass, m, moving with velocity, v, is $K = \frac{1}{2}mv^2$ The potential energy of a mass, m, raised through a distance, h, is P = mgh, where g is the acceleration due to gravity The energy units resolve themselves into the fundamentals (see table, p 306)

energy = ML^2T^{-2} = mass × (velocity of light)^2 or into units of mass (or weight), length, and time, and can be expressed in the C G S or F P S systems, thus

unit of velocity v = LT^{-1}
unit of acceleration a = 981 C G S units
unit of force F = Ma
unit of pressure p = dyne per cm^2 (981 C G S units)
p = atmosphere (1,013,663, C G S units)
unit of work erg = dyne per cm
1 kilogram meter = 981 × 10^5 ergs

Practical conversion factors

1 International joule = 1 00034 absolute joules
1 absolute joule = 0 99966 international joules
= 10^7 ergs
= 0 101972 kilogram meters
= 0 737560 foot-pounds
= 0 277778 × 10^{-6} kilowatt-hours

enesol Mercury salicylarsenite
engineering Utilizing the physical properties of matter in inventing, designing, constructing, building and managing structures and machines See applied *physics* **chemical-** The branch of e or chemistry concerned with the design, erection and operation of chemical plants
Engler, Carl (1842–1925) A German chemist noted for his work on petroleum and as an editor **E degree** A relative unit of viscosity
enhanced Intensified, *e g*, the enhanced lines of a spectrum
enidin An anthocyanin and a split-product of enin
enimization An intramolecular rearrangement of amines and imines analogous to the keto-enol equilibrium

—C CH NH— ⇆ —CH CH N—
enamic form enimic form

enin A glucoside and coloring matter of black grape skins, hydrolyzed to enidin and glucose
enndecane Nonadecane
ennea- A prefix indicating nine
enneadekane Nonadecane
enol form The alcohol form of a ketone characterized by the bivalent C=(OH)R radical See *isomerism, desmotropy, ketone*
enolic ester type A compound of the enol form, $R_2C{=}C(OH)R$
ensilage (1) Silage, or fodder preserved in a silo (2) The process of making silage
ensmartis Ferriammonium chloride
enstatite $MgSiO_3$ A grayish, rhombic, magnesium silicate, d 3 1, hardness 5 5
enterokinase An activating enzyme of the intestinal epithelium, which transforms trypsinogen to trypsin
enthalpy The heat content, H, per unit mass expressed in B Th U per pound H = E + PV/J, where E is internal energy, P absolute pressure (lb per ft^2), V specific volume (ft^3 per lb) and J = joules equivalent (778 ft-lb per B Th U)

entropy The unavailable energy of a substance which is due to the internal (irregular and compensating) motion of the molecules, it is used internally and cannot be utilized for mechanical work Cf *free energy* The state of molecular chaos of a system (Gibbs) or the extent to which an energy system has "run-down" (Tolman) Entropy is directly proportional to the quantity of heat contained in a body, and inversely proportional to its temperature, hence when a substance absorbs or radiates heat, a change in e occurs At absolute zero e vanishes The same concept is expressed by the statements entropy tends to a maximum, free energy tends to a minimum, a reaction tends to an equilibrium, and at equilibrium, the entropy is at maximum

-enyl A suffix indicating a bivalent unsaturated hydrocarbon radical, as, ethenyl

enzyme A catalyst produced by living cells which has a specific action and optimum activity at a definite pH value The classification is based upon the type of reaction, or the material (substrate) acted upon The first e crystallized was *urease* (Sumner 1926) later *pepsase* (Northrop, 1930), *trypase* (Northrop and Kunitz 1931) and *amylase* (Caldwell, Booher and Sherman 1931) They are generally proteins The more common enzymes and their pH optima are

Amylase, salivary	6 1–6 9
Amylase, pancreatic	7 0
Amylase, malt	4 6–5 2
Catalase	7 0
Erepsin, intestinal	7 7
β-Glucosidase	5 0
Lipase, pancreatic	8 0
Lipase, gastric	4–5
Lipase, salivary	7 6–7 8
Lipase, ricinus	4 7
Melibiase	5 5
Maltase	6 1–6 8
Maltase, Solanum indicum	5 5
Papain	4–7
Pectolase	4 5–6 7
Pepsin (on egg albumin)	1 2–1 6
Pepsin (on gelatin)	3 0–3 5
Pepsin, synthetic action	4 0
Phosphatase, bone	9 5
Phosphatase, plasma	8 8–9 2
Phosphatase, red blood cells	6 0–6 8
Phosphatase, plant sources	3 4–6 0
Phosphatase, synthetic action	9 4
Protease, autolytic (kidney, liver)	4 5
Rennin	5 4
Sucrase, intestinal	6 8
Sucrase yeast	4 4–4 6
Sucrase, Solanum indicum	6 0
Trypsin, pancreatic	8 0
Trypsin, synthetic action	5 7
Tyrosinase	6–8
Urease	7 0

amylolytic- E hydrolyzing starch to dextrin and maltose, *e g*, amylase, amylo-pectinase **anti-** A substance which inhibits the action of an e **apo-** See *holo-* **holo-** The whole enzyme, which is divided into the apo-enzyme (or protein carrier) and the co-ferment (q v) **blood-** E of the blood, q v **co-** See *coferment* **coagulating-** E changing soluble proteins to insoluble products, *e g*, thrombin, myosinase, rennet **cytohydrolytic-** The enzymes which render cellulose soluble, *e g*, cytase, cellulase **deamidizing-** E hydrolyzing amines to ammonia and hydroxy acids or purine bodies, *e g*, deamidase, adenase, guanidase **decarboxylizing-** E splitting CO from organic acids, *e g*, carboxylase **desmo-** An insoluble e linked to insoluble cell constituents *Cf lyo-* **glycolytic-** E hydrolyzing glucosides to glucose and residue, *e g*, glucosidase **hydrolytic-** The large group of enzymes hydrolyzing carbohydrates to simpler sugars, *e g*, inulase, pectinase **inactive-** A non-reactive e Cf *zymogen, optimal* **inverting-** E which change optically inactive sugars to optically active carbohydrates, or dextro-rotary to levorotary or vice versa *e g*, invertase **lipolytic-** E hydrolyzing esters (fats, etc) to fatty acids and alcohols, *e g*, lipases, butyrases **lyo-** The soluble form of an e which can be dissolved from the cell Cf desmo- **pro-** A zymogen q v **proteolytic-** E hydrolyzing proteins to albumoses and peptones, *e g*, pepsin, trypsin **oxidizing-** E oxidizing alcohols or aldehydes to acids, or phenols to quinones, *e g*, oxidase aldehydase, alcoholoxydase, phenolases **reducing-** E which reduce oxidizing agents such as hydrogen peroxide, *e g*, peroxidase, catalase **yellow-** A compound of protein with lactoflavine phosphate, obtained from yeast

e elixir A palatable preparation of pepsin and rennet used as general gastric tonic

ENZYMES

A HYDROLASES, or hydrolytic enzymes which hydrolyze complex compounds to simpler compounds according to the general equation $R\,R' + H_2O = RH + R'OH$

1	carbohydrases	splitting carbohydrates
	cellulase	acts upon cellulose
	cytase	acts upon hemicellulose
	diastase, and amylase	act upon starch
	invertase	acts upon sucrose
	lactase	acts upon lactose
	maltase	acts upon maltose
	pectinase	acts upon pectin
	inulase	acts upon inulin
2	esterases	splitting fats
	lipase	fat to glycerol and fatty acid
	butyrase	fat to alcohol and fatty acid
	chlorophyllase	chlorophyll to phytol
3	glucosidases	splitting glucosides
	emulsin (amygdalase)	beta-glucosides
	invertase	alpha-glucosides
	rhamnase	monosaccharides
	myrosinase	monosaccharides
	phytase	phytin to inositol
	tannase	tannin to gallic acid
4	proteases	splitting proteins
	peptase (pepsin)	to peptones
	tryptase (trypsin)	to peptides
	peptidase	to peptides
	ereptase (erepsin)	to aminoacids
	arginase	to urea
	carbamase	to amines
	nuclease	to nucleins
5	amidases	splitting urea
	urease	to CO_2 and NH_3
6	deaminases	liberating ammonia
	desamidase	aminoacids to hydroxy acids
	guanase	guanine to xanthine
	adenase	adenine to hypoxanthine
7	coagulases	coagulate proteins
	thrombase (thrombin)	fibrinogen to fibrin
	rennase (rennin)	casemogen to casein
	chymase (chymosin)	casein to paracasein

B ZYMASES, or fermenting enzymes which generally change monosaccharides to lactic acid, butyric acid or alcohol, etc

1	alcoholases (yeast ferment, zymase)	sugars
2	lactacidase	milk sugar
3	vinegar-oxidase	alcohol
4	endo-tryptase	peptids

C OXIDASES, or oxidizing ferments

1	aldehydases	aldehydes to acids
2	alcoholoxidases	alcohols to acids
3	phenolases	phenols to quinons
4	laccases	phenols
5	purine-oxidases	purines
6	uricase	urine
7	tyrosinase	tyrosine

D REDUCTASES, or reducing enzymes,

1	hydrogenase	(in fresh milk)

E CATALASES or catalyzing enzymes which decompose or synthesise, as

1	catalase	Hydrogen peroxide to water
2	nitrilase	Hydroxynitriles to aldehydes
3	oxynitrilase	Aldehydes to hydroxynitriles
4	phosphatase	Combine sugars and phosphates

F ANTICATALASES, oppose catalaytic action

1	cozymase	assists zymase
2	carboxylase	oxidizes —COOH to CO_2

enzymolysis A chemical change produced by enzyme action

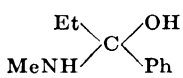
enzymosis Enzymolysis, with special reference to fermentation

eosin, eosine $C_{20}H_8O_5Br_4$ = 648 84 Tetrabromfluorescein, bromeosin Red, triclinic needles, insoluble in water, soluble in alcohol, alkalis, or acetic acid, used as a dye and indicator (alkalis = greenish fluorescence, acids = yellow) **soluble-** (1) Commercial eosin (2) Eosin, yellowish

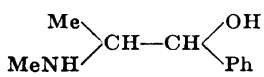
e bluish Erythrosin **e dyes** Dyestuffs for wool and silk derived from fluorescein, *e g*, eosin, erythrosin, phloxin, uranin, rose bengal **e soluble** Eosin, yellowish **e, yellowish.** $C_{20}H_6O_5Br_4K_2$ = 724 83 or $C_{20}H_6O_5Br_4Na_2$ = 691 83 The potassium or sodium salt of eosin A reddish to brownish powder, soluble in water or alcohol, used as a dye for coloring solutions, etc

eosins A group of dyestuffs derived from triphenylmethane

ephedrine $C_{10}H_{15}ON$ = 165 1 α-methylamino-α-ethyl benzyl-alcohol,

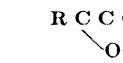


An alkaloid from *Ephedra gracilis*, a Gnetaceae of Europe **levo-** α-phenyl-β-methyl-β-methyl-amino-ethanol,



An alkaloid from the Chinese drug MaHuang from *Ephedra equisetina*, a Gnetaceae White crystals, m 38–40, soluble in water, alcohol, or chloroform, used similarly to e hydrochloride **pseudo-** The dextroisomer of α-phenyl-β-methyl-β-methyl amino ethanol An alkaloid from *Ephedra vulgaris*, a Gnetaceae of Japan Colorless crystals, m 115, insoluble in water, soluble in alcohol, ether, or chloroform Cf *hordenine, anhaline, adrenalin* **e hydrochloride** $C_{10}H_{15}ON\,HCl$ = 201 57 White needles, m 214, soluble in water or alcohol Used medicinally as a mydriatic, and in ophthalmology as an atropine substitute **levo-** Colorless crystals, readily soluble in water Used as an adrenalin substitute to raise blood pressure, also in bronchial asthma and hay fever **(pseudo-)** Yellowish crystals, m 175, soluble in water or alcohol Used in ophthalmology as 10 % solution

epi- (1) A Greek prefix indicating upon, through, or toward (2) A prefix indicating a bridge or intramolecular connection, as,



epi-position ε- The 1 6-position of naphthalene or other condensed rings

epiborneol $C_{10}H_{18}O$ = 154 20 3-camphanol, 3-hydroxy camphane An isomer of borneol, q v

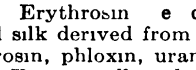
epiboulangerite $Pb_3Sb_2S_8$ A metallic sulfantimonide of lead

epicaine A vasopressor and local anesthetic, said to be α-(3 4-dihydroxyphenyl)-β-(*p*-aminobenzoyl-β-diethylaminoethanol)-α-ethanone hydrochloride

epicamphor $C_{10}H_{16}O$ = 152 2 3-Camphanone, 3-ketocamphane, β-camphor An isomer of camphor in which the keto group is in the 3-position

epicatechol $C_{15}H_{14}O_6$ = 290 11 *d-* or Catechol-e Colorless prisms, m 245, from gambir catechu *l-* Thick white prisms, m 245 *dl-* Colorless needles, m 225

epichlorohydrin C_3H_5OCl = 92 51 Chloropropylene oxide, *1*-chloro-*2 3*-epoxypropane,



A colorless liquid, $d_0°$ 1 203, b 117, insoluble in water, miscible with alcohol or ether Used as a solvent for resins and nitrocellulose, and in the manufacture of varnishes, lacquers, and cements for celluloid articles Cf *epihydrin*

epichlorite A basic, aluminum-iron silicate of the chlorite group

epicyanohydrin C_3H_5OCN = 83 07 Cyanopropylene oxide, β,γ-expoxybutyronitrile Colorless prisms, m 162, soluble in hot water or alcohol

epidichlorohydrin $C_3H_4Cl_2$ = 110 95 *2-3*-Dichloropropene* A colorless liquid, $d_{25}°$ 1 209, b 96, insoluble in water, soluble in alcohol or ether, used as a solvent

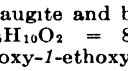
epididymite $Na_2O\ 2BeO\ 6SiO_2\ H_2O$ A beryllium silicate Rhombic crystals, d 3 55

epidosite A crystalline schist derived from diabase

epidote $HCa_2(Al,Fe)_3Si_3O_{16}$ Pistacite A crystalline schist which occurs commonly in gneisses, garnet rock, amphibolite, etc Greenish, monoclinic masses, d 3 3–3 5, hardness 6–7, soluble in hydrochloric acid after calcination

epidotization The disintegration of feldspar, hornblende, augite and biotite into epidote

epiethylin $C_5H_{10}O_2$ = 86 07 Glycidyl ethyl ether, *2 3*-epoxy-*1*-ethoxypropane



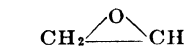
A colorless liquid, d 0 94, b 124, used as solvent for shellac, copals, synthetic resins, and gums

epigenite $Cu_7As_2S_{12}$ A sulfoarsenide of copper containing iron

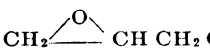
epiguanine $C_6H_7ON_5$ = 165 1 2-amino-6-methyl-8-oxypurine, methylguanine A purine body found in the urine, especially during leukemia

epihydric acid Glycidic acid **e alcohol** Glycidol

epihydrin C_3H_6O = 58 1 Propylene epoxide The heterocyclic compound



A colorless liquid, d 0 859, m 35, soluble in water **e alcohol** Glycidol **e carboxylic acid** $C_4H_6O_3$ = 102 1 The monobasic acid



Colorless crystals, m 225

epihydrinic acid Glycidic acid

epiiodohydrin C_3H_5OI = 183 89 *1 2*-Epoxy-*3*-iodopropane, γ-iodopropylene oxide A colorless liquid, d_{13}° 2 03, b 160, insoluble in water, but miscible with alcohol, used as a solvent

epimeric Having the relationship of epimerides, q v

epimerides Epimers An isomeric pair of substances differing only in the arrangement of H and OH on the last asymmetric carbon atom of a chain, as, *d*-glucose and *d*-mannose, or *d*-ribose and *d*-arabinose

epimers Epimerides

epinephrine The U S P and B P name for adrenalin, q v **e bitartrate** Suprarenin

epinine $C_9H_{13}NO_2$ = 167 1 *3 4*-Dihydroxy phenyl ethyl amine, $(HO)_2C_6H_3(CH_2)_2NHMe$ Colorless crystals, synthetic substitute for epinephrine, used as vasoconstrictor

epiosin $C_{16}H_{12}N_2$ = 232 2 Methyldiphenylenamidoazol Glassy prisms, m 195, insoluble in water, soluble in alcohol Used medicinally as an anodyne and morphine substitute

epipastic A dusting powder

epiphenylin $C_9H_{10}O_2$ = 150 08 Glycidyl phenyl ether, *2 3*-epoxy-*1*-phenoxy propane, O CH$_2$ CHCH$_2$OPh A colorless liquid, d 1 11, b_{22mm} 131, used as solvent for shellac, resins and nitrocellulose

epiphyte An organism living on, but not feeding on another organism, *e g* , orchids

epipolic Fluorescent

episol A brand of sodium morrhuate used as sclerosing agent

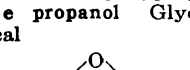
epispastic A vesicant, or a drug which blisters the skin

episperm The membrane between the shell and kernel of a seed

epistilbite $Ca_2Al_4Si_{11}O_{30}$ A colorless, monoclinic calcium aluminum silicate, d 2 24–2 36, hardness 3 5–4

e p m Abbreviation for equivalents per million = p p m /equivalent weight in mgms Used to express water analyses

epoxy- A prefix indicating a —O— bridge in a molecule, as, O CH$_2$ CH$_2$ epoxyethane*, CH$_2$ CH$_2$CH$_2$ 1 3-epoxypropane* cf *methoxy-*, *ethoxy-* **e propanol** Glycidol **e propionic** The radical



e propionic acid Glycidic acid

epsilon The Greek letter ε The symbol for ergon, etheron, dielectric constant, electrode potential, epiposition ε **acid** *3-6*-Naphthylamine disulfonic acid

Epsom salts Magnesium sulfate

epsomite $MgSO_4$ A native magnesium sulfate occurring in colorless, rhombic prisms, d 1 7, hardness *2*

epuration The purification of sugary liquors by defaction etc

epuré A bituminous mixture obtained from Trinidad, used for constructional work

equation (1) A symbolical expression of equality (2) A chemical notation indicating a change or chemical reaction The formulae of the reacting substances are placed on the left, those of the reaction products on the right, separated by the equality sign, this indicates that the total number of atoms of each kind on the left and on the right must balance The equation

(a) $2NaOH + H_2SO_4 = Na_2SO_4 + 2H_2O$

is translated into the statement Two molecules of sodium hydroxide and one molecule of sulfuric acid will give one molecule of sodium sulfate and two molecules of water The ionic equation

(b) $Ba^{++} + SO_4^{--} = BaSO_4$

is translated into One barium ion (furnished by any soluble barium salt) and one sulfate ion (furnished by any soluble sulfate or by sulfuric acid) will give barium sulfate (which relatively is unionized, since it is almost insoluble) **analytical-** An equation showing the separation or decomposition of a compound into simpler constituents (see *analysis*) **electronic- Ionic-ionic-** An equation indicating changes involving ions, *e g* , substances in solution Cf equation (b) **metathetical-** An equation expressing a metathesis **molecular-** An equation indicating a molecular change or molecular reaction Many molecular equations can be put into ionic form In this case, the molecular equation indicates a specific instance of a certain reaction, while the corresponding ionic equation is the general statement of the reaction, *e g* , equation (a) in the ionic form becomes

(c) $2OH^- + 2H^+ = 2H_2O$,

which is the general equation for neutralization **transmutation-** An e which indicates the disintegration or synthesis of elements, thus,

$$_1H^1 + {}_5B^{11} \rightarrow 3{}_2He^4$$

means that element No 5 (boron with isotopic weight 11) is bombarded by a proton (element No 1, hydrogen with weight 1) and forms 3 atoms of element 2 (helium of weight 4) Similarly $_4Be^9 + {}_2He^4 \rightarrow {}_0n^1 + {}_6C^{12}$, where element No 0 is a neutron The sum of the atomic numbers (prefixed subscripts) as well as the sum of the isotopic weights (suffixed superscript) is the same on both sides

e of state A group of mathematical expressions derived from the equation pv = RT, which define the physical conditions of a homogeneous liquid or gaseous system by relating concentration or volume (v), pressure (p), and absolute temperature (T) for a given mass of substance

(1) Ramsay-Young equation p = kT − c
(2) Van der Waal equation

$$RT = \left(p + \frac{a}{v^2}\right)(v - b)$$

(3) Dieterici equation

$$p(v - b) = RTe - \frac{A}{RTv}$$

(4) Clausius equation

$$RT = \left[p + \frac{a}{T(v + c)^2}\right](v - b)$$

k and c are constants depending on the volume, R is the gas constant, *a* the constant correcting for molecular attraction, and *b* the volume occupied by the molecules, A expresses the work done to overcome molecular attraction and e is the base of natural logarithms See *gas constants, van't Hoff's factor*

equilenin $C_{18}H_{18}O_2$ = 266 2 *3*-Hydroxy-*17*-keto-estrapentaene A sterol (q v) and sex hormone produced by the biological degradation of cholesterol occurring in the urine during pregnancy See *cholane*

equilibrium A condition in which contending forces are balanced or equalized independently of time Cf *triple point, quadruple point, diagram* **chemical-** The balanced state reached when chemical reaction apparently stops, that is, when the concentrations of reaction products and the original reacting substances are such that decomposition and recombination proceed with equal speed, as, $2Fe + 3H_2O \leftrightarrows 3H_2 + Fe_2O_3$ See *mass action* The more general types are

	Acid-base e	Oxidation-reduction e
Maintained by	Buffer	Poiser
Determined by	pH-indicator	rH-indicator
Expressed as	pH	rH

disturbed- The removal of one or more reaction products or reacting substances from a chemical equilibrium, causing a shift of the equilibrium *E g* , if a gas is formed during a chemical reaction, and is continuously removed, the reaction will be completed **heterogeneous-** A chemical equilibrium between two (or more) phases, *e g* , a solid and gas, or liquid and gas **homogeneous-** A chemical equilibrium in a single phase, *e g* , between two dissolved substances, or between gas and gas, liquid and liquid, etc **invariant-** An e in which the quantity of one component approaches zero **ionic-** An e which involves a balanced condition of ions **kinetic-** The balanced state of two opposite reactions Cf *static e* **molecular-** An e in which the components are molecules **monophase-** Homogeneous- **polyphase-** Heterogeneous- **stable-** A mobile condition which, after a casual displacement, is again restored **static-** The equilibrium attained when all reaction ceases

e constant Same as dissociation constant See *Mass Action Law*

equilin $C_{18}H_{20}O_2$ = 268 2 *3*-Hydroxy-*17*-keto-estratetraene A female sex hormone produced by the biological degradation of cholesterol See *cholane*

equipartition (1) The orderly arrangement of atoms, *e g* , in a crystal (2) The condition of molecules in a gas, where the molecules keep the same average distance apart under the same pressure

equisetic acid Aconitic acid

Equisetum A genus of herbaceous, spore-producing plants (horsetail, scouring rush, bottle brush) which are rich in silica

equivalence The relative combining powers of a set of atoms or radicals **e point** The theoretical end-point of a titration, which differs by the titration error from the actual end-point obtained in practice

equivalent (1) The weight in grams of an element that combines with or displaces one gram of hydrogen (2) The weight of a substance contained in one liter of a normal solution This quantity is determined by (a) dividing the atomic weight of an element by its valency (*e g* , an equivalent of a ferrous salt = 56/2), or (b) by dividing the molecular weight of a compound by the valency of its principal atom or radical (*E g* , an equivalent of NaOH is 40/1 an equivalent of sulfuric acid is 98/2) (c) By calculating the quantity of a substance that combines with one gram of hydrogen or with 8 grams of oxygen (3) Having the same valency **electrochemical-** See *electrochemical* **gram-** The equivalent weight of a substance in grams *E g* , sodium hydroxide, 40 grams, sulfuric acid, 49 grams **milli-** The weight of a substance in grams contained in 1 milliliter of a normal solution **toxic-** The lethal dose (q v)

e charge The amount of electricity in a gram-e of substance, *i e* , 6 06 × 10^{23} electrons or 96,494 Int Coulombs Cf *Faraday* **e conductivity** See *conductivity* **e weight** A gram-equivalent, *e g* , the equivalent of a substance in grams, which is calculated by dividing its formula weight by its valency (With *acids*, the number of replaceable H-atoms with *bases* the number of OH-groups)

Er The symbol for erbium

era See *geologic era*

erbia Erbium oxide

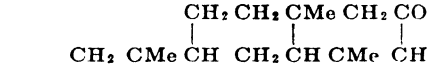
erbium Er = 167 2 Atomic number 68 A rare earth metal, discovered in 1879 by Cleve in the erbia of Marignac (1878) and Berlin (1860) The erbia discovered and named in 1843 by Mosander was actually terbium A metallic substance, d 4 77 insoluble in water, soluble in acids Erbium is trivalent and forms red salts It is not used in industry **e acetate** $Er(C_2H_3O_2)_2 4H_2O$ = 416 77 Pink triclinic crystals, d 2 144, soluble in water **e nitrate** $Er(NO_3)_3 6H_2O$ = 461 8 Pink crystals, soluble in water or alcohol **e oxalate** $Er_2(C_2O_4)_3 10H_2O$ = 779 44 A reddish powder, d 8 64, decomp 575 **e oxide** Er_2O_3 = 383 4 Erbia An orange, amorphous powder, insoluble in water, soluble in acids At high temperature it glows with a greenish light See **e sulfate** $Er_2(SO_4)_3 8H_2O$ = 767 6 Rose-red crystals, soluble in water

Erdmann, H 1862–1910 A German chemist noted for qualitative and quantitative analytical methods **E , Otto Linné** (1804–1869) A German chemist noted for atomic weight determinations, and as author and editor (*Journal für praktische Chemie*) **E float** A small, partly filled, sealed glass tube for obtaining accurate burette readings **E reagent** (1) Concentrated sulfuric acid containing 2 drops

of conc nitric acid per 100 cc , used as a reagent for alkaloids (2) A solution of 1 8-amino-naphthol-4 6-disulfonic acid, which gives an intense red color with nitrites

erdschreiber An extract made by autoclaving earth with a solution of sodium nitrate and sodium dihydrogen phosphate, used as a culture medium

eremophilone $C_{15}H_{20}O$ = 218 15 A ketone, m 42, occurring in the wood oil of *Eremophila mitchelli*, a Myoporaceae of Australia



erepsin A proteolytic enzyme of the intestinal mucous membrane, the pancreatic juice, and other animal and vegetable tissues, it splits proteoses, peptones, etc to amino acids

ereptase Erepsin

erg The C G S unit of work or energy the force necessary to overcome the resistance of one dyne acting through one centimeter

1 Joule = 10^7 ergs
1 Foot-poundal = 4 214 × 10^5 ergs
1 gram-calorie (20°C) = 4 184 × 10^7 ergs

ergamine Histamine

ergine (1) $C_{16}H_{17}N_3O$ = 267 14 A base obtained by hydrolysis from ergotoxine and ergotinine Cf *lysergic acid* (2) Erogone A categorical name for substances which exert biological catalytic effects in small quantities (*e g* , vitamins, hormones and enzymes)

ergobasine Ergometrine

ergochrysin $C_{28}H_{28}O_{12}$ = 556 2 A yellow pigment, m 366, from ergot

ergoflavine $C_{15}H_{14}O_7$ = 306 1 A yellow pigment, m 344, from ergot, resembling vitexine

ergometrine $C_{19}H_{23}N_3O_2$ = 329 2 Ergobasine, ergotocin, ergostetrine An active alkaloid from ergot, colorless crystals, m 159, $[\alpha]_D^{20}$ + 90°, soluble in water with blue fluorescence Used in obstetrics

ergon (1) ϵ or $h\nu$ An energy quantum, q v ϵ = 6 554 × 10^{-27} erg sec = $h\nu$ (2) Vitazyme

ergonovine Ergometrine

ergosine $C_{30}H_{35}N_5O_5$ = 545 3 An alkaloid m 228, produced by treating ergosinine with acid

ergosinine $C_{30}H_{35}N_5O_5$ = 545 3 An alkaloid, decomp 228, from ergot

ergostane $C_{27}H_{48}$ = 372 5 The hydrocarbon corresponding with ergosterol and isomeric with cholestane Cf *sterols*

ergosterin Ergosterol

ergosterol Ergosterin An inert alcohol derived from ergot, which occurs in yeast and is the provitamin of vitamin D For its structure see *sterols* It is a mixture of (1) $C_{26}H_{40}O$ = 368 31, a white solid, d 1 041, m 154, b_{22mm} - 185, and (2) $C_{27}H_{42}O$ = 383 32, a colorless solid, m 165 Cf *irradiation* **irradiated-** Viosterol

ergostetrine Ergometrine

ergot Ergota, spurred rye, *Secale cornutum* The dried sclerotium of *Claviceps purpurea*, a Hypocreaceae or fungus, occurring on numerous grasses, especially replacing the grain of rye, *Secale cereale*, *Gramineae* From this hard, black, shining, and elongated mycelium or spawn, a number of different medicinal preparations are made, usually from the yearly and new crop of Spanish ergot Among the numerous substances identified as active principles are ergometrine, ergotoxine, histamine, tyramine, and acetylcholine The inert substances of ergot are ergotinine, ergothioneine, secalonic acid, sclererythrin, clavicepsin, ergosterol, fungisterol, vernine, amino acids, and secale aminosulfonic acid See *ergotine*

ergotamine See *gynergen*

ergothioneine $C_9H_{15}O_2N_3S\ 2H_2O$ = 265 44 An inert alkaloid of ergot

ergotic acid An acid, $C_{15}H_{30}O_{15}(NH_2)SO_3H$, in ergot

ergotine A dark, red-brown extract of ergot, used medicinally as an emmenagogue, oxytocic, vaso-constrictor, and hemostatic **E Bonjean** An aqueous extract of e , purified by alcohol **E Bombelon, E Denzel, E Keller, E Kohlmann** Extracts of ergot prepared by different methods **E Wernich** A dialysed extract of ergot which has previously been purified by alcohol or ether **E Wiggers** A dried extract of fat-free ergot **E Yvon** An extract of ergot made with tartaric acid

ergotinine $C_{35}H_{39}O_5N_5$ = 609 6 The anhydride of ergotoxine and an alkaloid of ergot Yellowish, long needles which darken on exposure to air, m 219–229, insoluble in water soluble in alcohol or ether It is physiologically inactive **amorphous-** Ergotoxine **hydro-** Ergotoxine **e citrate** An amorphous, grayish powder, slowly soluble in water **e Kraft** Ergotoxine **e Tanret** Ergotoxine ,

ergotocin Ergometrine

ergotoxine $C_{35}H_{41}O_6N_5$ = 627 8 Ergotinine Kräft, or Tanret Hydro-ergotinine, amorphous ergotinine A yellowish, amorphous powder, m 138, sparingly soluble in water, soluble in alcohol or ether, and physiologically inactive

Ericaceae Heather family, a group of shrubs or trees with bell-shaped flowers Many plants of this group contain glucosides, and their leaves are used as drugs

Arctostaphylos uva ursi	bearberry
Arctostaphylos glauca	manzanita
Gaultheria procumbens	wintergreen
Chimaphila umbellata	pipsissewa
Epigaea repens	trailing arbutus
Vaccinium crassifolium	vaccinium
Vaccinium oxycoceus	cranberry
Kalmia latifolia	mountain laurel
Ledum latifolium	Labrador tea
Oxygendrum arboreum	sourwood
Rhododendron maximum	great laurel

ericin Mesotan

ericinol $C_{10}H_{16}O$ = 152 2 An alcohol of *Ledum palustris* or wild rosemary, an Ericaceae and the split-product of ericolin A colorless, oily liquid with a peculiar odour, which becomes darker and yellow on exposure

ericolin $C_{25}H_{56}O_{21}$ = 800 6 A glucoside from *Ledum palustris* or wild rosemary, an Ericaceae A brownish, soft, mass, soluble in water

erigeron Fleabane, coltstail, prideweed The herb or seeds of *E canadense*, a Compositae, used as an astringent and tonic **e oil** The essential oil of e , d 0 845–0 865, containing d-limonene, terpineol and esters

erilite A plastic made from casein and formaldehyde Cf *galalith*

erinite $Cu_3(AsO_4)_2 2Cu(OH)_2$ Native, basic copper arsenate It is emerald green in color and is a decomposition product of enargite

eriodictyol A chalcone of phloroglucinol occurring as glucoside in eriodictyon It is isomeric with hesperidin

eriodictyon Mountain balsam Yerba santa The dried leaves of *Eriodictyon californicum*, a Hydrophyllaceae It is used medicinally as an aromatic and expectorant as a fluid-extract or syrup **e oil** The essential oil of e, d 0 937, soluble in 70 % alcohol

erionite A rock-forming mineral of the zeolite group

Erlangen blue Prussian blue

Erlenmeyer, R A K E 1825–1909 A German chemist noted for organic research **E flask** or **erlenmeyer** A conical glass flask with flat bottom used extensively in chemical laboratories

erogone Ergine (2)

erose A bacterial growth characterized by irregularly toothed margins

erosion Denudation The wearing away, especially of rocks due to the action of weather or chemical substances, *e g*, alkaline waters Cf *corrosion, surrosion*

errhine A drug which causes an increase in nasal secretions Cf *sternutatory*

error (1) Deviation from the truth (2) The principle that the accuracy of a determination depends on the accuracy of the data on which it is based, and which it therefore, cannot exceed

mean- The quantity $\pm\sqrt{\Sigma d^2/(n-1)}$, where Σd is the sum of the deviations of individual values from the mean, n the number of determinations **mean- of the mean** The quantity $\pm\sqrt{\Sigma d^2/n(n-1)}$

erucic acid $C_{22}H_{42}O_2$ = 338 45 *cis- 13*-Docosenoic acid* A fatty acid found in the oil of raisin seeds grape seeds, and mustard oil Small, colorless needles, d 0 860, m 33, b $_{15mm}$ = 264, insoluble in water, soluble in alcohol It is an isomer of brassidic and cetoleic acids

erucidic acid Brassic acid

eryodiction Eriodictyon

erysicine A mixture of erysodine and erysovine (q v) from *Erythrina* alkaloids

erysimin A glucoside from the seeds of *Erysimum* species Cruciferae It resembles digitalis physiologically

erysodine An alkaloid m 201, from *Erythrina* species

erysopine An alkaloid, m 242, from *Erythrina* species

erysovine An alkaloid, m 178, from *Erythrina* species

erytaurin A glucoside from centaury, *Erythraea centaurium*, a Gentianaceae

erythraea Bitter herb, canchalaqua The herb of *Erythraea chilensis*, a Gentianaceae resembling centaurea, q v It is used as a bitter tonic and stimulant

erythrene Bivinyl

erythric acid (1) $C_4H_8O_5$ = 136 1 The dextrotrihydroxy-butyric acid $CH_2OH(CHOH)_2$-COOH (2) Sometimes applied to *erythrin* (3) e of Brugnatelli Alloxan

erythrin (1) $C_{20}H_{22}O_{10}$ = 422 20 A colorless, microcrystalline powder, m 137, sparingly soluble in water, soluble in alcohol, a constituent of *Roccella tinctoria* (2) A native cobaltous arsenate Cf *erythrine*

erythrina (1) The coral tree, a Papilionaceae of the West Indies, East Indies, Central America, and the Malay States (2) A genus of Leguminosae (Cf *erysodine, erysovine*)

erythrine An alkaloid from the seeds of *Erythrina broteroi* of the Dutch Indies, *Erythrina carralooides* of Mexico, *Erythrina corallodendron* of Brazil, and other species of leguminous plants Used medicinally as antidote to strychnine, as a hypnotic, and in epilepsy Cf *erythrol*

erythrinine An alkaloid from the bark of *Erythrina broteroi*

erythrite (1) Phycsite, red cobalt A native cobalt arsenate (2) Erythritol

erythritic acid Erythric acid

erythritol $C_4H_{10}O_4$ = 122 09 Erythrol, erythrite, phycite, tetrahydroxy-butane, erythroglucin, lichen sugar, $H(CHOH)_4H$ A tetrahydric alcohol from the lichen, *Protococcus vulgaris*, a split-product of erythrine Tetragonal prisms, $d_{17°}$ 1 452, m 112, b 330, soluble in water or alcohol, insoluble in ether **nitro- E tetranitrate penta-** $C_5H_{12}O_4$ = 136 1 A tetrahydric alcohol, colorless crystals, m 250 Cf *pentaerythritol*

e benzene Fuchsin **e ether** $C_4H_8O_2$ = 86 1 The heterocyclic compound

e tetraacetate $C_{12}H_{18}O_8$ = 290 14 White crystals, used as plasticizer for cellulose acetate, to increase the transmission of ultraviolet light **e tetranitrate** $C_4H_6O_{12}N_4$ = 302 3 $C_4H_6(NO_3)_4$ Tetranitro erythrol, tetranitrol Yellowish crystals which explode when heated, m 61, slightly soluble in water, soluble in alcohol Used medicinally as a vasodilator and prophylatic in preventing pain, and as an explosive

erythrocentaurin $C_{17}H_{24}O_8$ = 476 2 The red coloring matter of *Erythraea centaurium* and *Sabbatia angularis*, which resembles santonin Needle-shaped crystals, darkening in light, m 136, insoluble in water, soluble in hot alcohol

erythrocephaelin The coloring matter of ipecac

erythrocruorin Hemoglobin

erythrocyte A red-blood corpuscle

erythrodextrin A split-product of starch, dextrin which gives a red color with iodine Cf *achrodextrin* It is an intermediate in the salivary digestion of starch

erythroglucin Erythrol(2)

erythrol (1) Erythritol (2) $C_4H_8O_2$ = 88 04 *3*-Butene-*1 2*-diol, $CH_2OH\,CHOH\,CH\,CH_2$ White crystals, d 1 047, m 196 5

erythrolitmin $C_{26}H_{23}O_{13}$ = 543 2 Deep-red crystals derived from *Corona solis*

erythronium The name given by del Rio in 1804 to vanadium, which was rediscovered by Sefstrom in 1831

erythrooxyanthraquinone $C_{14}H_8O_3$ = 224 08 Oxy-anthraquinone Orange-red needles, m 190, soluble in alcohol, ether, or alkalis

erythrophloeine, erythrophlœine An alkaloid from the bark of *Erythrophloeum guineense*, a Leguminosae of Guinea, used by natives as an ordeal poison A dark-yellow, syrupy liquid, sparingly soluble in water, soluble in ether, alcohol, or glacial acetic acid, its use as a local anesthetic has been proposed Cf *sassy bark*

Erythrophloeum, Erythrophlœum A genus of leguminous trees of West Africa furnishing the

sassy, casca, or mancona bark, used by the natives as ordeal poison

erythroprotid $C_{13}H_8O_5N$ = 258 1 A red split-product of proteins obtained by boiling them with concentrated alkali

erythroquine reaction A test for alkaloids in which a characteristic color is formed on adding, in succession, chloroform, bromine water and potassium ferrocyanide

erythroretin $C_{38}H_{36}O_{14}$ = 716 4 A red coloring matter from rhubarb

erythrose $C_4H_8O_4$ = 120 1 Trihydroxybutyric-aldehyde CHO $(CHOH)_2$ CH_2OH A tetrose or sugar derived from erythrol, it occurs in dextro- and levo- forms Its isomers are threose, erythrulose

erythrosiderite K_2FeCl_5 A rare potassium-ferric chloride mineral

erythrosin (1) $C_{13}H_{18}O_6N_2$ = 298 2 A red compound obtained by treating tyrosine with nitric acid (2) $C_{20}H_8O_5I_4$ = 835 84 Tetraiodofluorescein Pyrosin Yellow crystals, insoluble in water soluble in alcohol, used as a dye (**dye**) (3) $C_{20}H_6O_5I_4Na_2$ = 879 82 Eosin bluish, sodium iodoeosin sodium tetraiodofluorescein Reddish-brown powder, soluble in water or alcohol, used as a dye, and hydrogen ion indicator, changing at pH 2 0 from orange (acid) to magenta (basic) Cf *iodeosin*

erythroxyline Cocaine

erythroxylon Coca

erythrulose $C_4H_8O_4$ = 120 06 A ketose and tetrose derived from erythritol

erythrytol Erythritol

es or **e s** An abbreviation for the c g s -electrostatic unit of quantity of electricity

Esbach, Georges Hubert 1843–1890 A French physician noted for clinical analytical methods

E albuminometer A graduated test tube for estimating the amount of albumin in urine

E reagent A solution of 1 gm trinitrophenol and 2 gm citric acid in 100 cc water, used for determining albumin in urine

escaping tendency Potential of temperature A measure of the tendency of a substance to change from one state to another *e g* , from solid to liquid

escharotic A caustic drug or a substance that produces a crust of dead tissue

eschatin An extract of lipoids from the suprarenal cortex, used in the hormone therapy of Addison's disease

Eschka mixture A mixture of 2 parts magnesium oxide and 1 part dried sodium carbonate, used as a reagent for determining sulfur in coal or coke

eschwegite $5Y_2O_3$ $5(Ta,Nb)_2O_5$ $10TiO_2$ $7H_2O$ A reddish gray, isotropic rare-earth mineral

esciorein, æsciorcin Escorcin

escoquinine Quinine aesculinate

escorcin $C_9H_8O_4$ = 180 1 Escorcinal, æscorcin A brown powder, soluble in alkalis, and derived from aesculetin Used in ophthalmology

esculetin $C_9H_6O_4$ = 178 1 Aesculetin, 6,7-dihydroxycoumarin A split-product of aesculin **methoxy-** Gelseminic acid **methyl-** Scopoletin

esculetinic acid $C_9H_8O_5$ = 196 06 Aesculetinic acid Colorless crystals, m 168

esculin $C_{15}H_{16}O_9$ = 340 20 Aesculin, aesculinic acid, anallachrom, polychrom, bicolorin A glucoside from the seeds of *Aesculus hippocastanum*, or horse chestnut White colorless needles, slightly soluble in water, readily soluble in alcohol or alkalis, giving fluorescent solutions Sulfuric acid converts it into esculetin and glucose Used medicinally as an antimalarial, and in ophthalmology

-ese A suffix denoting a synthesizing enzyme (q v) It is added to the name of the substance formed by the synthesis Cf *-ase*

esenbeckic acid An acid, resembling quinovic acid, from the bark of *Esenbeckia febrifuga*, a Rutaceae of tropical America

esenbeckine $C_6H_{18}NO_6$ = 200 2 An alkaloid from the bark of *Exostemma souzanum*

eseridine $C_{15}H_{23}O_3N_3$ = 293 2 An alkaloid derived from eserine occurring in calabar beans Colorless crystals, m 132, soluble in alcohol, ether, or chloroform, used as a laxative in veterinary medicine

eserine Physostigmine

Esmarch bottle A device for sampling water at any depth by removing and replacing the stopper mechanically

eso- Prefix indicating that an element or radical is substituted for a hydrogen atom attached to a ring atom

esotoo Trade name for liquid sulfur dioxide

esoxin A ptomaine from the sperm of white fish, pike and lake trout

esparto A tall grass, *Stipa tenacissima*d an *lygeum spartum*, Gramineae of Northern Africa, used in the manufacture of paper Cf *alfa*

esperium Es See *ekaosmium*

essence (1) A solution of a volatile or essential oil in alcohol (2) The active principle of a plant (3) A fruit essence q v **e niobe** Methyl benzoate

essential Pertaining to an essence **e oils** Volatile oils, ethereal oils A group of volatile oils of characteristic odors, distilled from plants, leaves, flowers, etc Distinguished from fatty oils by their volatility, non-greasiness, and non-saponifying property Two classes

A Existing in plants, as such, and imparting the characteristic odor to flower, leaves or woods
1 Terpenes (oil of turpentine juniper, etc)
2 Terpenes and stearoptenes (oil of peppermint, lemon, etc)

B Developed from plant constituents by
1 Enzyme action (oil of mustard, bitter almond, etc)
2 Produced by heat (empyreumatic oils, cade, tar, creosote etc)

They are inflammable, soluble in alcohol or ether, slightly in water Constituents

Hydrocarbons	Ocymene, myrcene, cymene, styrene, pinene, camphene, fenchene, limonene, phellandrene, etc
Alcohols	Methanol, benzyl-alcohol, rhodinol citronellol, geraniol, linalool, nerol, menthol, terpinol, etc
Phenols	Anol, chavicol, charvacrol, thymol, anethol, safrol, estragol, etc
Ethers	Anethole, eugenole, eucalyptole, safrole, geranyl alkyl ethers, phenyl alkyl ethers
Aldehydes	Citronellal, geranial, santalal, benzaldehyde, anisaldehyde, cinnamaldehyde, vanillin, ionone, etc
Ketones	Anisacetone, menthone, irone, ionone, fenchone, camphor, carvone, pulegone, etc
Acids	Hydrocyanic acid, tiglic acid, caproic acid, etc
Esters	Benzyl acetate, cinnamyl acetate, geranyl acetate, linalyl acetate, eugenyl acetate, methyl benzoate

e salt Any salt obtained by evaporating the juices of plants

essolube A lubricating oil made by the hydrogenation of inferior petroleum distillates

essonite $6CaO\ 3SiO_2 + 2Al_2O_3,\ 3SiO_2$ Garnet lime-alumina, wolfsbergite Calcium garnet A white or pale yellow mineral

ester (1) Ethereal salt An organic salt formed from an alcohol (base) and an organic acid by elimination of water (see list)

$$R\ OH + R'\ COOH = R'COO\ R + H_2O$$
alcohol acid ester water

(2) Compounds of the type R_2SO_4 or R COOM are erroneously called esters (3) The ethyl esters of an acid, *e g*, diacetic ester is ethyl diacetyl diacetate

HCOOMe	methyl formate
HCOOEt	ethyl formate (*essence of rum*)
MeCOOEt	ethyl acetate
$MeCOOC_5H_{11}$	amyl acetate (*banana oil*)
$MeCOOC_4H_8Me$	isoamyl acetate (*pear oil*)
EtCOOMe	methyl propionate
EtCOOEt	ethyl propionate
PrCOOMe	methyl butyrate
PrCOOEt	ethyl butyrate (*pineapple oil*)
$C_4H_9COOC_5H_{11}$	*iso*-amyl *iso*-valerate (*apple oil*)
C_6H_5COOMe	methyl benzoate
$C_6H_4(OH)COOMe$	methyl salicylate (*oil of wintergreen*)
$C_6H_4(NH_2)COOMe$	methyl anthranilate (*orange blossom oil*)

acid- Ether acid Corresponding with the acid salts, the acid esters are compounds of polybasic acids in which not all the carboxyl hydrogen atoms are replaced by alcohol radicals, *e g*, R OOC R COOH **alkamine-** See *alkamine ester* **basic-** Corresponding with the basic salts, the basic esters are compounds of polyhydric alcohols in which not all the hydroxyl groups are replaced by acid radicals, *e g*, R COO R OH or X R OH where X is a halogen **imido-** See *imido ester* **mixed-** An e in which the radicals R of, R COOR, are different **Robison-** Hexosemono-phosphoric acid, formed in the fermentation of sugar by yeast

e number The difference between the saponification number and acid number It is therefore the number of mg KOH needed to saponify the neutral esters in 1 gm of a fat, oil, or wax **e oils** Pale edible oils produced by esterification of refinery acids with glycerol

esterase An enzyme or ferment capable of saponifying esters

esterification The formation of an ester by dehydrating or catalytic agents **e law** Meyer's law Esterification of aromatic acids is retarded and prevented in presence of 1- and 2-ortho-substituents, respectively

esterol A brand of benzyl succinate used as antispasmodic

estimation An approximate evaluation, often incorrectly used for "determination" (q v)

estoral Menthyl borate

estragole $C_{12}H_{18}O$ = 178 14 Methyl chavicol, *p*-allylanisole, *p*-methoxy allyl benzene MeO - C_6H_4 C_5H_{11} An ether of anise-like odor, occurring in estragon oil

estragon oil Tarragon oil A yellowish essential oil, d 0 9–0 94, obtained from the herb *Artemisia dracunulus*, a Compositae

estrane $C_{18}H_{30}$ = 246 2 The parent compound of female sex-hormones See *androstane* and *cholane* derivatives

e diol $C_{18}H_{30}O_2$ = 278 2 *3 17*-Dihydroxyestrane Cf *oestrone* **e triol** $C_{18}H_{30}O_3$ = 294 2 *3 16 17*-Trihydroxyestrane

estranol $C_{18}H_{30}O$ = 262 2 *3*-Hydroxyestrane Cf *oestrone*

estratriene $C_{18}H_{24}$ = 240 2 $\Delta^{1\ 3\ 5}$-estratriene The parent compound of oestrone Cf *androstane, cholane*

estrin Oestrone

estriol Oestriol

estrogen Oestrone

estrone Oestrone

esu or e s u E S U or electro-static units For values and conversion to e m u, see *electromagnetic units*

Et (1) An abbreviation for the ethyl radical, $-C_2H_5$ (2) The symbol for ekatantalum

-et A suffix See *-uret*

eta The Greek letter η A symbol for viscosity

Étard's reaction The oxidation of methyl radicals to aldehyde radicals by means of chromyl chloride

$$R\ CH_3 + Cr(OCl)_2 = R\ CHO + H_2O + CrCl_2$$

E salt The complex potassium chromium sulfate, $K_3[Cr(SO_4)_3]$

etch-figure The characteristic pattern produced when a polished metallic surface is etched by a suitable reagent.

eteline See *chlorinated* solvents

ethacetic acid *n-Butyric acid*

ethal Cetyl alcohol

ethaldehyde Cetyl aldehyde

ethalic acid Palmitic acid

ethamine Ethylamine

ethanal* Acetaldehyde **hydroxy-*** Glycolaldehyde **trichloro-*** Chloral **e acid** Glyoxalic acid

ethanamide* Acetamide

ethanamidine* Acetamidine

ethane* C_2H_6 = 30 05 Methylmethane, dimethyl, Me Me, ethylhydride, EtH An alkane or a saturated hydrocarbon of the methane series Colorless gas, $d_{air=1}$ 1 049, m −172, b −86 slightly soluble in water, soluble in alcohol or ether, a constituent of natural and illuminating gas The following radicals are derived from ethane

monovalent	
ethyl-	$-CH_2Me$ or $-C_2H_5$ or Et
divalent	
ethylene-	$-CH_2\ CH_2-$
ethylidene-	$=CH\ CH_3$ or $=CHMe$
trivalent	
ethenyl-	$\equiv C\ CH_3$ or $\equiv CMe$
ethenylidene-	$=CH\ CH<$
tetravalent	
acetylene	$=CH\ CH=$

The following unsaturated hydrocarbons are derivatives of ethane

ethene* or ethylene	$CH_2\ CH_2$
ethyne*, ethine or acetylene	CH CH

amino- Ethylamine* **bromo-*, chloro-***, etc See *ethyl bromide, ethyl chloride*, etc **dibenzoyl-** Diphenazine **dibenzyl-** Diphenylbutane **dibromo-*, dichloro-***, etc See *ethyl-*

ene bromide, ethylene chloride, etc **dihydroxy-** Glycol **diphenyl-** Dibenzyl **hexabromo-*** Hexabromo ethane **hexachloro-*** Hexachloroethane **hydroxy-** Ethanol* **nitro-** See *nitroethane* **nitroso-** See *nitrosoethane* **perchloro-** Hexachloro- **phenyl-** Ethyl benzene **triethoxy-*** Ethenyltrimethyl ether

e dial* Glyoxal **e diamide*** Oxamide **e diamine*** Ethylene diamine **e dinitrile*** Cyanogen **e dioic acid*** Oxalic acid **e diol*** Glycol **e dioyl chloride*** Oxalyl chloride **e dithiol*** Dithioglycol **e nitrile*** Acetonitrile **e sulfinic acid*** Ethyl sulfinic acid **e sulfonic acid*** Ethyl sulfonic acid **e thiol*** Ethyl mercaptan **e thiolic acid*** Thiol*acetic acid* **e thionamide*** Thioacetamide

ethano- A prefix indicating the presence of a $—CH_2\ CH_2—$ bridge, thus in 1 4-ethano anthracene the $—CH_2\ CH_2—$ bridge is between the first and fourth carbon atom of anthracene

ethanoic acid* Acetic acid **oxo-*** Glyoxylic acid **e anhydride*** Acetic anhydride

ethanol* C_2H_6O = 46 046 Ethyl alcohol, alcohol, spirit, spirit of wine, grain alcohol, absolute alcohol, ethyl hydrate, etc (1) Absolute alcohol, dehydrated alcohol Et OH A colorless liquid, d^{25}_4 0 78505, m −117 3, b 78 32, miscible with water or ether Used as a reagent and solvent (2) 99 % alcohol The "absolute alcohol" of the U S and British Pharmacopoeia, used extensively for tinctures and pharmaceutical preparations, as a solvent and preservative, as an antiseptic medium and in perfumery (3) Grain alcohol, cologne spirits A colorless liquid containing 90 % ethanol and 10 % water (4) Diluted alcohol, proof spirits A colorless liquid containing about 49 % (by weight) ethanol and 51 % (by weight) water (5) Denaturated alcohol An alcohol made unpotable by the addition of poisonous substances such as methanol, pyridine, formaldehyde, sublimate or other denaturant It is used in industry, the arts and commerce, principally as a solvent or fuel See also *methylated spirits* **amino-*** Colamine **butoxy-*** Butyl*cellosolve* **chloro-*** Ethylene chlorohydrin **cyano-** Ethylene cyanohydrin **ethoxy-*** Cellosolve **imino-** See *iminoethanol* **oxybis-** Diethylene glycol **phenyl-** Benzyl carbinol **tribromo-*** Avertin **trichloro-*** See *trichloroethanol* **trimethyl-** Butyl carbinol

ethanolamine C_2H_7ON = 61 05 β-Hydroxyethylamine, monoethanolamine, $NH_2(CH_2)_2OH$ A colorless liquid, d 1 04, b $_{150mm}$171, readily soluble in gasoline or CCl_4 and useful for dry cleaning, cleaning grease spots, machinery, etc **di-** Diethanolamine **tri-** Triethanolamine

ethanoyl* Acetyl

ethene* C_2H_4 = 28 04 (1) Ethylene, olefiant gas Colorless, inflammable gas of peculiar odor, $d_{air=1}$ 0 978, m −189, b −102 7, slightly soluble in water, soluble in alcohol or ether From ethene the radicals vinyl-, $—CH\ CH_2$, and vinylene-, $—CH\ CH—$, are derived Used in surgery and dentistry to produce anesthesia, as a substitute for nitrous oxide (2) The radical ethylene (*q v*) **e dichloride** Ethylene chloride **e series** Olefines The homologs of ethene, or a group of aliphatic hydrocarbons (q v) having the general formula, C_nH_{2n}

etheno- A prefix indicating the presence of a $—CH\ CH—$ bridge, thus, *4,7*-ethenoindene has a $—CH\ CH—$ bridge between the fourth and seventh carbon atom of indene Cf *ethano-*

ethenol Vinyl alcohol

ethenone Ketene

ethenyl The trivalent $H_3C\ C\equiv$ radical, derived from ethane **e amide** Acetamidine **e amine*** Vinyl amine **e aminophenol** C_8H_7ON = 133 06 A colorless liquid, $d_0°$ 1 136, b 201, insoluble in water, soluble in alcohol **e aminothiophenol** C_8H_7SN = 149 20 A colorless liquid, b 238, insoluble in water, soluble in ether or alcohol **e bromide** Vinyl bromide **e chloride** Trichloroethane **e diphenylamidine** $C_{14}H_{14}N_2$ = 210 13 Colorless needles, m 131, sparingly soluble in water, soluble in alcohol or ether **e triethylether** $C_8H_{18}O_3$ = 162 17 Triethoxyethane A colorless liquid, $d_{22°}$ 0 94, b 142, decomp by hot water, soluble in alcohol or ether **e tricarboxylic acid** $C_5H_6O_6$ = 162 07 Colorless prisms, decomp on heating, insoluble in water, soluble in alcohol or ether

ethenylidene The trivalent radical $=CH\ CH_2—$ **e chloride** β-Trichloroethane

ether (1) An alkyl or aryl oxide of the general type R O R , derived from an alcohol by replacing the hydrogen of the hydroxyl group by another radical, *e g* ,

$$R\ OH + R\ OH = R\ O\ R + H_2O$$

See *ethers* (2) $C_4H_{10}O$ = 74 10 Ethylic ether, ethyl oxide, ethoxy ethane*, diethyl ether, sulfuric ether, Et_2O A clear, colorless, mobile liquid, d 0 720, m −116, b 35, slightly soluble in water, miscible with alcohol or benzene Used as a reagent and solvent for fats, resins, alkaloids, and other organic compounds and medicinally as an anesthetic (3) In physics Æther A hypothetical, all-pervading and all-permeating medium of the universe, which is considered the medium for the transmission of radiations such as, light, heat, and electricity It is supposed to consist of etherons, (q v) but its existence has not been proved by experiment

acetic- Ethyl acetate **aldehyde-** Crotonic aldehyde **anhydrous-** Ethyl ether which has been distilled over sodium, used as a reagent and solvent **allophanic-** Ethyl allophanate **anesthetic-** Ether (2) **decachlor-** Perchlor ether **dichloro-** Dichlorethyl ether **diethyl-** Ether (2) **dimethyl-** See *methyl ether* **formic-** Ethyl formate **hydrobromic-** Ethyl bromide **hydrochloric-** Ethyl chloride **hydrocyanic-** Ethyl cyanide **hydroiodic-** Ethyl iodide **isopropyl-** See *propyl-* **methyl-** Methyl ether **mixed-** An e in which the R of R O R differ, as MeOEt **petroleum-** Distilled petroleum The 50–60°C fraction **simple-** An e in which both R of R O R are, alike, as Et O Et **sulfuric-** Ether (2)

e acid An acid ester, q v **e alcohol** A compound of the type R O R OH, as, the mono- or di-ether of a glycol or glycerol **e of crystallization** The molecules of e in a crystal lattice as a component part of the crystal

ethereal Resembling or made with ether, *e g* , highly volatile **e fruit oil** See fruit oil **e liquid** A highly volatile liquid **e oil** Essential oil **e salt** Ester

etherene Ethylene

etheric acid Acetoacetic acid

etheride A compound containing the —COX radical, in which X is a halogen

etherification The process of making an ether from an alcohol Cf *ethers*

etherin Obsolete name for ethylin **e theory** A theory of the constitution of organic compounds (Dumas & Boullay, 1828)

etherion A supposed element, atomic weight 0 001, expelled from substances at high temperatures and extremely low pressures

etheron Ætheron A supposed particle of ether, smaller and faster than an electron, having a mass of $\frac{1}{4^{1}}$ × 10^{9} that of hydrogen and a speed of 294,000 miles per second

etherophosphoric acid Ethyl phosphoric acid

etherosulfuric acid Ethyl sulfuric acid

etherphone An instrument for the production of music by electricity It works on the principle of the oscillating wireless valve

ethers (1) A group of alkyl or aryl oxides, derived from the alcohols by replacing the hydrogen of the hydroxyl group by another radical

$$R\,OH + R\,OH = R\,O\,R + H_2O$$

They are named R-oxides, or indicated by the prefix R-oxy- or alkoxy-, thus dimethyl oxide or methoxymethane*, ethyl methyl oxide or methoxyethane* (2) The halogen derivatives of alkyl and aryl radicals are sometimes called ethers, *e g*, R Cl (3) The esters of inorganic or organic acids are sometimes called ethers, *e g*, R NO_2, R COO R **complex-** Compound- **compound-** (1) Alkyl or aryl oxides in which two different radicals are joined by the oxygen, R O R′, *e g*, methylethylether (2) Esters **haloid-** Alkyl or aryl halides **mixed-** Compound- **simple-** Alkyl or aryl oxides having two like radicals, R O R, *e g* diethylether **thio-** An alkyl or aryl sulfide, *e g*, an ether in which the oxygen is replaced by sulfur (see *mercaptans*) Examples of ethers

a Aliphatic saturated

methyl ether	Me O Me
ethyl methyl ether	Et O Me
ethyl ether	Et O Et
ethyl propyl ether	Et O $(CH_2)_2CH_3$
n-propyl ether	$(MeCH_2CH_2)_2O$
i-propyl ether	$(Me_2CH)_2O$

b Aliphatic, unsaturated

vinyl ether	$(CH_2\ CH)_2O$
allyl ether	$(CH_2\ CHCH_2)_2O$
crotonyl ether	$(CH_3CH\ CHCH_2)_2O$
propargyl ether	$(CH\ CCH_2)_2O$

c Cyclic ethers

ethylene oxide	CH_2CH_2O
1 2-propylene oxide	Me CH CH_2 O
1 3-propylene oxide	$CH_2\ CH_2\ CH_2\ O$

d Diethers and triethers

methylal	$(MeO)_2CH$
acetal	$(EtO)_2CHMe$
dioxan	$CH_2\ CH_2\ O\ CH_2\ CH_2\ O$
trioxymethylene	$CH_2\ O\ CH_2\ O\ CH_2\ O$
paraldehyde	CHMe O CHMe O CHMe O

e Aromatic ethers

anisole	Me O Ph
phenetole	Et O Ph
veratrole	MeO C_6H_4 OMe
phenyl ether	Ph O Ph
benzyl phenyl ether	Ph CH_2 O Ph
benzyl ether	Ph CH_2 O CH_2 Ph
naphthyl ether	$C_{10}H_7$ O $C_{10}H_7$

ethide A compound of the ethyl radical and a metal as

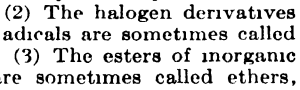
lead ethide	$PbEt_2$
zinc ethide	$ZnEt_2$
beryllium ethide	$BeEt_2$
magnesium ethide	$MgEt_2$

ethidene Ethylidene

ethine Acetylene **e series** Acetylene series, q v A group of unsaturated aliphatic hydrocarbons with one triple bond general formula, C_nH_{2n-2}

ethinyl Acetenyl The univalent CH C— radical, derived from acetylene

ethionic acid $C_2H_6O_7S_2$ = 206 1 Ethylene sulfonic acid HO SO_2 CH_2 CH_2 SO OH A dibasic acid known only in solution Cf *isethionic acid* **amino-** Taurine **e anhydride** $C_2H_4O_6S_2$ = 188 2 The heterocyclic compound



SO, CH, CH_2, SO_2, O, colorless crystals

ethiops mineral Black mercurous sulfide

ethocaine Procaine **e borate** Borocaine

ethodin Rivanol

etholide A tertiary lipid formed from alcohol-acids by the esterification of the hydroxyl group of one with the carboxyl groups of the other molecule

ethoxalyl The monovalent radical, EtOOC - CO—

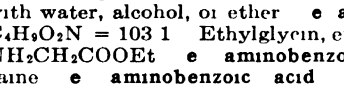
ethoxide Ethylate

ethoxy The monovalent C_2H_5O— or EtO— radical derived from ethanol Cf *oxethyl* **e acetic acid** Ethyl glycollic acid **e acetone** $C_5H_{10}O_2$ = 102 1 The ketone ether, MeCOCH$_2$OEt A colorless liquid, b 128, used as a solvent for nitrocellulose **e amine*** C_2H_7ON = 61 06 2-hydroxyethylamine α-ethyl hydroxylamine NH_2 CH_2 CH_2OH **e aniline** $C_8H_{11}ON$ = 137 10 A colorless liquid, $d_0°$ 1 11, b 286, sparingly soluble in water, soluble in alcohol or ether **e benzoic acid.** The ethyl ether of salicylic acid EtO C_6H_4 - COOH **e butyric acid** Hydroxy-ethylbutyric acid **e catechol** $C_8H_{10}O_2$ = 138 1 A homolog of guaiacol **e caffeine** $C_{10}H_{14}O_3N_4$ = 238 51 Colorless crystals, m 140 Difficultly soluble in water or alcohol, soluble in hot ether Used medicinally as a narcotic

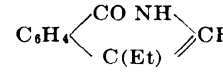
ethoxyl Same as ethoxy

ethyl (1) The monovalent C_2H_5— or Et— radical, derived from ethane (2) A misnomer for ethyl gasoline, q v **e acetamide** C_4H_9ON = 87 08 MeCONHEt A colorless liquid $d_4°$ - 0 942, b 200, used in organic synthesis **e acetate** $C_4H_8O_2$ = 88 06 Acetic ether acetic ester, acetidin, ethyl acetic ester Me COOEt A colorless liquid, $d_0°$ 0 900, m −82 4 b 77, slightly soluble in water, miscible with alcohol or ether Used medicinally as a stimulant and antispasmodic, as a reagent in organic synthesis, as a solvent for lacquers and in the separation of dyes **e acetoacetate** $C_6H_{10}O_3$ = 130 11 Acetoacetic ester, diacetic ether, MeCOCH$_2$COOEt A colorless liquid, $d_{15°}$ 1 030, m −80 b 181, slightly soluble

in water, miscible with alcohol or ether, used as a solvent for nitrocellulose, and in organic synthesis **e acetylene** Butine **e acid phosphate** See *e phosphate* **e acid** E arsenic acid **e acid sulfate** E sulfuric acid **e aconitate** $C_{12}H_{18}O_6$ = 258 2 A colorless, oily liquid of aromatic odor **e acrylate** $C_5H_8O_2$ = 100 09 A colorless liquid, $d_0°$ 0 939, b 98 5 **e alcohol** Ethanol* **e aldehyde** Acetaldehyde **e allyl** (1) C_5H_{10} = 70 09 A colorless liquid, b 70 (2) A prefix indicating the presence of an ethyl and an allyl radical **e allylether** $C_5H_{10}O$ = 86 11 3-ethoxypropylene $EtOCH_2CH{:}CH_2$ A colorless liquid, $d_{25°}$ 0 799, b 66, insoluble in water soluble in alcohol or ether **e amine*** C_2H_7N = 45 11 Ethamine Aminoethane, $EtNH_2$ A ptomaine from putrefying yeast and wheat flour A colorless liquid, d 0 689, b 16 5, m −84, miscible with water, alcohol, or ether **e aminoacetate** $C_4H_9O_2N$ = 103 1 Ethylglycin, ethylglycocoll NH_2CH_2COOEt **e aminobenzoate** Benzocaine **e aminobenzoic acid** $C_9H_{11}O_2N$ = 165 20 $EtNH\,C_6H_4\,COOH$ Colorless prisms, m 112, slightly soluble in water, soluble in alcohol or ether **e ammeline** $C_5H_9ON_5$ = 155 4 Ethylamido cyanurate



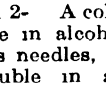
e amyl (1) C_7H_{14} = 98 108 Δ^1-heptene The hydrocarbon $Me(CH_2)_4CH{:}CH_2$ A colorless liquid, b 99 (2) A prefix indicating the presence of an ethyl and an amyl radical **e amylaniline** $C_{13}H_{21}N$ = 191 2 Amyl-ethyl-phenyl-amine, $Et\,N(C_5H_{11})(Ph)$ A colorless, oily liquid, b 262, soluble in alcohol **e amylether** $C_7H_{16}O$ = 116 2 The mixed ether $Et\,O\,C_5H_{11}$ A colorless volatile liquid **e amylketone** $C_8H_{16}O$ = 128 17 Colorless liquids, nearly insoluble in water, miscible with alcohol or ether **n-** $Et\,CO\,(CH_2)_4Me$ *3-*Octanone* d 0 825, b 165 **active-** $MeCH_2{-}CHMe\,CH_2\,CO\,Et$ 5-Methyl-3-heptanone* b 161 **tert-** $MeCH_2\,CMe_2\,CO\,Et$ *4 4*-Dimethyl-3-hexanone* d 0 825, b 151 **e amylsulfide** $C_7H_{16}S$ = 132 *2* The mixed thioether $Et\,S\,C_5H_{11}$ A colorless liquid **e aniline** See *aniline* **e anthracene** $C_{16}H_{14}$ = 206 12 Colorless scales m 60, insoluble in water, soluble in alcohol **(dihydro-)** $C_{16}H_{16}$ = 208 14 A colorless oil, $d_{18°}$ 1 049, m 320, insoluble in water, miscible with alcohol or ether **e antimonide** Acid antimony ethide **e arsen** See *arsine* **e arsenate** A salt of e arsenic acid **e arsenic acid** $C_2H_7O_4As$ = 170 1 Ethylacid $EtO\,AsO(OH)_2$ **e arsenite** A salt of e arsenous acid **e arsenous acid** $C_2H_5O_3As$ = 152 1 $EtO\,AsO_3$ **e arsine** The primary arsine $EtAsH_2$ **e arsinic acid** E arsenic acid **e azotate** E nitrate **e azotite** E nitrite **e benzene** See *benzene* **e benzoate** $C_9H_{10}O_2$ = 150 13 The ester PhCOOEt A colorless liquid b 213, slightly soluble in water, miscible with alcohol or ether **e benzoic acid** See *benzoic acid* **e benzoylacetate** $C_{11}H_{12}O_3$ = 192 16 Benzoylacetic ester, $PhCOCH_2COOEt$ A colorless liquid, d 1 121, b 267, insoluble in water, miscible with alcohol or ether **e benzylaniline** $C_{15}H_{17}N$ = 211 2 Ethyl benzyl phenyl amine The tertiary amine $Ph\,N(Et)(CH_2Ph)$, b 710mm- 285 **e benzylate** E benzylether **e benzylbenzene** $C_{15}H_{16}$ = 196 2 The hydrocarbon $Et\,C_6H_4\,CH_2Ph$ **e benzylether** $C_9H_{12}O$ = 136 15 Ethyl benzylate, benzylethyl oxide $Et\,OCH_2Ph$ A colorless liquid, $d_{15°}$ 0 950, b 186, insoluble in water, miscible with alcohol or ether **e benzylketone** $C_{10}H_{12}O$ = 148 15 1-phenyl-butan-2-one, $Et\,CO\,CH_2Ph$ A colorless liquid, $d_{17°}$ 0 998, b 223, insoluble in water, miscible with alcohol or ether **e borate** A salt of ethanol and boric acid **(ortho-)** $C_6H_{15}O_3B$ = 146 2 E orthoborate, boron triethoxide, triethylic borate $B(OEt)_3$ A colorless inflammable liquid **(meta-)** $C_4H_{10}O_4B_2$ = 144 1 E metaborate, $(EtO)_2(BO)_3$ A colorless, heavy liquid **(pyro-)** $C_2H_5B_3O_5$ = 141 4 E triborate A colorless gummy mass **e boric acid** $Et_2B(OH)_3$ = 73 87 White crystals, subliming 40, soluble in water, alcohol or ether **e borosalicylate** Boryl **e bromacetate** $C_4H_7O_2Br$ = 167 04 A colorless liquid, $d_{25°}$ 1 507, b −159, insoluble in water, miscible with alcohol or ether **e bromide** C_2H_5Br or EtBr = 109 01 Aethylium bromatus, aether bromatus monobromoethane, bromic ether bromoethane*, EtBr A colorless liquid, d 1 450, m −116 b 39, almost insoluble in water, miscible with alcohol or ether Used medicinally as a local anesthetic Cf *ethylene bromide* **e butylether** $C_8H_{18}O$ = 102 15 The mixed ether EtOBu A colorless liquid, $d_{20°}$ 0 752, b 92, insoluble in water, miscible with alcohol or ether **e butylketone** $C_7H_{14}O$ = 114 16 Heptan-3-one, $Et\,CO\,Bu$ A colorless liquid, b 147, insoluble in water, soluble in alcohol or ether **e butyrate** $C_6H_{12}O_2$ = 116 11 Ethylbutyric ester $PrCOOEt$ A colorless liquid, d 0 902 b 121, insoluble in water, miscible with alcohol or ether If sufficiently diluted, its odor resembles pineapple, hence, it is sometimes used for flavoring **(iso-)** Ethylisobutyric ester $Me_2CHCOOEt$ A colorless, aromatic liquid, $d_{0°}$ 0 890, m −93 3 b 110, sparingly soluble in water, soluble in alcohol or ether **e cacodyl** Diethyl arsine **e cacodylic acid** Diethyl arsinic acid **e caproate** $C_8H_{16}O_2$ = 144 2 E caproic ester, $Me(CH_2)_4COOEt$ A colorless liquid, $d_{0°}$ 0 888, m 167, soluble in alcohol or ether **e caprylate** $C_{10}H_{20}O_2$ = 172 17 Ethyl caprylic ester A colorless liquid, $d_{16°}$ 0 873, b 30, soluble in alcohol **e carbamate** Urethane **e carbazole** $C_{14}H_{13}N$ = 195 13 Colorless scales, m 68, soluble in hot alcohol or ether **e carbimide** E isocyanate **e carbinol** Propanol **e carbonate** $C_5H_{10}O_3$ = 118 11 Carbethylic acid, carbonic ester, diethyl carbonic ether diatol, Et_2CO_3 A colorless, inflammable, aromatic liquid d 0 978, b 126, insoluble in water, soluble in alcohol Used in organic synthesis, and as a solvent for nitrocellulose and resins **(ortho-)** $C_9H_{20}O_4$ = 192 2 Tetraethylcarbonate, tetraethoxymethane $C(OEt)_4$ A colorless, aromatic liquid **e carbonic acid** Propionic acid **e carbostyril** $C_{11}H_{11}ON$ = 174 12 The heterocyclic compound



Colorless crystals, m 168 **e carbylamine** EtNC E isocyanide **e chaulmoograte** The ethyl esters of the mixed acids of chaulmoogra oil, a clear pale yellow liquid, d 0 904 **e chloracetate** $CH_2Cl\ COOEt$ = 122 53 A colorless liquid, $d_{20°}$ 1 159, b 145 insoluble in water **e chloracetoacetate** $C_6H_9O_3Cl$ = 164 55 The ester $MeCOCHClCOOEt$ A colorless liquid, $d_{25°}$ 1 179, b 197, slightly soluble in water, miscible with alcohol or ether Used in organic synthesis **e chloralurethane** Somnal **e chloride** C_2H_5Cl or EtCl = 64 50 Monochlorethane, hydrochloric ether, aethylium chloratus, aether, chloratus, kelene, chloroethane*, chelen, anodynon A colorless liquid, $d_{0°}$ 0 921, m −141 2 b 12 2, very slightly soluble in water, miscible with alcohol or ether On account of its low boiling point, it is marketed in sealed glass tubes, used as a local anesthetic and constituent of cognac essence, and as a refrigerant and ethylating agent **e chlorocarbonate** E chloroformate **e chloroformate** $C_3H_5O_2Cl$ = 108 52 E chlorocarbonate ClCOOEt A colorless liquid, d 1 139, b 93, decomp in water, miscible with alcohol or ether **e chloropropionate** $C_5H_9O_2Cl$ = 136 55 Ethyl chlorpropionic ester, aether chlorpropionicus, $MeCHClCOOEt$ A colorless aromatic liquid, d 1 087, b 146, slightly soluble in water, miscible with alcohol or ether **e chlorostannic acid** $H_2SnEtCl_5$ = 327 04 Colorless, deliquescent crystals, decomp in water **e cinnamate** $C_{11}H_{12}O_2$ = 176 16 Ethyl cinnamic ester, $PhCH\text{-}CHCOOEt$, aether cinnamylicus A colorless, oily liquid, d 1 050, m 12, b 271, insoluble in water, soluble in alcohol or ether, used in flavoring extracts on account of its odor of strawberries **e crotonic acid** $C_6H_{10}O_2$ = 114 09 The unsaturated acid $MeCH\ CEt\text{-}COOH$ Colorless monoclinic crystals, m 40 (subliming) sparingly soluble in water, soluble in alcohol or ether, used in peppermint flavoring extracts **e cyanacetate** $C_5H_7O_2N$ = 113 13 Ethyl cyanacetic ester, aether cyanaceticus, $CN\ CH_2\ COOEt$ A colorless liquid, d 1 066, b 207, insoluble in water, miscible with alcohol or ether **e cyanamide** CH_2N_2 = 56 1 $CN\ NHEt$ A colorless, oily liquid **e cyanate** C_3H_5ON = 71 1 Cyanethelin, $EtOC\ N$ A colorless, unstable liquid, insoluble in water (iso-) $EtNCO$ = 71 1 Ethyl carbimide A colorless liquid, b 60, soluble in alcohol **e cyanide** C_3H_5N = 55 10 Propionitrile, hydrocyanic ether, ether cyanatus, propane nitrile*, EtCN A colorless liquid, $d_{20°}$ 0 780, b 97 1, soluble in water, miscible with alcohol or ether (iso-) E isocyanide **e cyanuramide** E cyanamide **e diacetoacetate** $C_8H_{12}O_4$ = 172 14 The ester $(MeCO)_2CHCOOEt$ A colorless liquid, d 1 101, b 200, slightly soluble in water **e dibromoacetate** $C_4H_6O_2Br_2$ = 246 0 Ethyl dibromoacetic ester, $Br_2CHCOO\text{-}Et$ A colorless liquid, miscible with alcohol or ether **e dibromocinnamate** Zebromal **e dichloroacetate** $C_4H_6O_2Cl_2$ = 156 97 Ether dichloraceticus, ethyl dichloracetic ester $Cl_2CHCOOEt$ A colorless liquid, d 1 283, b 156, very slightly soluble in water, miscible with alcohol or ether **e dichlorarsine** $C_2H_5AsCl_2$ = 175 0 Dick A liquid, d 1 66, b 155 A vesicant and lung-irritant poison gas **e dichloride** Ethylene chloride **e diethylacetoacetate** $C_{10}H_{18}O_3$ = 186 19 Diethylacetoacetic ethyl ester, $MeCO\ CEt_2\text{-}COOEt$ A colorless liquid, $d_{22°}$ 0 974, b 218, insoluble in water, miscible with alcohol or ether **e diethylmalonate** $C_{11}H_{20}O_4$ or $Et_2C\text{-}(COOEt)_2$ = 216 22 A colorless liquid d 0 992 b 223, insoluble in water, miscible with alcohol or ether **e diiodoacetate** $C_4H_6O_2I_2$ = 339 8 The ester, $I_2CHCOOEt$ An oily, colorless liquid, soluble in alcohol or ether **e diiodobrassidate** Lipoiodine **e diiodosalicylate** $C_9H_8O_3I_2$ = 417 8 Ether diiodosalicylicus $C_2H_2I_2(OH)COOC_6H_4$ Colorless crystals, m 132, sparingly soluble in water, soluble in alcohol, benzene or oils Used as an iodoform substitute **e diisoamyl tin bromide** $C_5H_{11}\text{-}SnEtBr$ = 369 83 A colorless liquid d 1 3650 **e diisobutyl tin bromide** $C_4H_9SnEtBr$ = 341 80 A colorless liquid, d 1 4089, b_{13mm} 130 6 **e dimethylamine** The tertiary amine $EtNMe_2$ **e dimethyl malonate** $C_9H_{16}O_4$ or $Me_2\ C\ (COOEt)_2$ = 188 18 A colorless liquid, d 1 002, b 196 5, insoluble in water, miscible with alcohol or ether **e dioxythiocarbonate** $C_5H_{10}O_2S$ = 134 1 Cf Xanthic acid A colorless, strongly refractive liquid, soluble in alcohol **e diphenylamine** $C_{14}H_{15}N$ = 197 25 Diphenyl ethylamine, $EtNPh_2$ A colorless liquid, b 296, insoluble in water, soluble in alcohol **e diphenylphosphine** $C_{14}H_{15}P$ = 214 2 Diphenylethylphosphine, $EtPPh_2$ A colorless liquid, b 293, insoluble in water, soluble in alcohol or benzene **e diselenide** $C_4H_{10}Se_2$ = 216 3 Diethyl selenide, ethyl perselenide, $EtSe\ SeEt$ A heavy, brown and pungent liquid, b 186 **e disilicate** $C_{12}H_{30}O_7Si_2O_2$ = 346 6 $[(EtO)_3Si]_2O$ A colorless, oily, inflammable liquid, with an odor resembling peppermint **e disulfide** $C_4H_{10}S_2$ = 122 21 Ethyl persulfide, ethyl dithioethane*, $EtS\ SEt$ A colorless liquid with garlic-like odor, $d_{22°}$ 0 993, b 153, sparingly soluble in water, soluble in alcohol **e dithiocarbonate** $C_5H_{10}OS_2$ = 150 23 Dithiourethane, $CO(SEt)_2$ d 1 085, b 196 5 **e ene** Ethylene **e ether** Ether **e fluoride** C_2H_5F = 48 05 Fluoroethane* EtF A colorless gas, $d_{air=1}$ 1 7, b −32, soluble in water or alcohol **e formamide** C_3H_7ON = 73 1 The aminoaldehyde $EtNH\ CHO$ A colorless liquid, $d_{21°}$ 0 952, b 199, soluble in alcohol or ether **e formate** $C_3H_6O_2$ = 74 07 Ethyl formic ester, $HCOOEt$ A colorless liquid, d 0 917, m −80, b 54 4, slightly soluble in water, miscible with alcohol or ether used medicinally as an antiseptic and for inhalations, also in flavoring extracts (peach kernel odor) and cognac essences **e furoate** C_4H_3COOEt A colorless liquid, d 1 1174, m 34, b 197, used as a solvent and industrial perfume **e fumarate** $C_8H_{12}O_4$ = 172 1 The ester $EtOOC\ CH\ CH\ COOEt$ A colorless, oily liquid **e gas, e gasoline** E petrol, "ethyl" Trade names for an antiknock motor fuel It contains per gallon of gasoline 6 cc of lead tetra-ethyl fluid, 36 5 % ethylene dibromide, 9 % monochlornaphthalene (the function of which is to remove the lead from the cylinders), and is colored with a trace of Sudan IV **e glycerate** $C_5H_{10}O_4$ = 134 11 The ester $CH_2OH\ CHOH\ COOEt$ A colorless liquid, d 1 091, b 235, slightly soluble in water, miscible with alcohol or ether **e glycine** $C_4H_9O_2N$ = 103 08 The amino acid $EtNH\text{-}CH_2\ COOH$ Colorless scales, decomp 160, soluble in water or alcohol **e glycolether**

Cellosolve **e glycollate** $C_4H_8O_3$ = 104 07 E hydroxyacetate, $HOCH_2COOEt$ A colorless liquid, $d_{23°}$ 1 083, b 160, soluble in alcohol or ether, an isomer of ethyl glycollic acid Used as a solvent for nitrocellulose and many resins **e glycollic acid** $C_4H_8O_3$ = 104 07 Ethoxyacetic acid, EtO CH_2 COOH A colorless liquid, b 206, soluble in alcohol, isomeric with ethyl glycolate **e green** Ethylated *crystal violet* (q v) **e hydrate** Ethanol **e hydrazine** $C_2H_8N_2$ = 60 15 NH_2 NHEt A colorless liquid, b 100, soluble in alcohol, water, or ether **e hydride** Ethane **e hydrine** Ethylin **e hydrobromide** E bromide **e hydrochloride** E chloride **e hydrocupreine** Optochine **e hydrogen sulfate** E sulfuric acid **e hydroperoxide** $C_2H_6O_2$ = 62 06 The peroxide EtO OH A colorless liquid, b $_{150mm}$ 26°, soluble in water, alcohol, or ether **e hydroselenide** E selenomercaptan **e hydrosulfide** E mercaptan **e hydroxyacetate** E glycollate **e hydroxylamine** C_2H_7ON = 61 11 **(alpha-)** Ethoxylamine NH_2OEt A colorless liquid, $d_{7°}$ 0 883, b 68, soluble in water, alcohol, or ether **(beta-)** Hydroxylethylamine, EtNHOH Colorless leaflets, d - 0 908, m 60, soluble in alcohol, ether, or water **e hydroxypropionate** $C_5H_{10}O_3$ = 118 1 **(alpha-)** E lactate **(beta-)** The ester CH$_3$-OH CH_2 COOEt A colorless liquid, b 187 soluble in water, alcohol or ether, it is a solvent for resins **e iodide** C_2H_5I = 156 02 Iodoethane*, hydroiodic ether, e hydroiodic ester ether iodatus, EtI A colorless liquid of penetrating, ethereal odor, d 1 92, m −112 b 72 3, slightly soluble in water, soluble in alcohol or ether Used for the separation of minerals, and in iodine therapy for inhaling producing short analgesia **e iodine calcium** EtCaI = 196 04 An amorphous powder, decomp in water **e iodoacetate** $C_4H_7O_2I$ = 214 0 K S K , CH_2I COOEt A colorless heavy oil, d 7 44, b 179 It is a lacrimatory war poison gas **e isoamylether** $EtOC_5H_{11}$ = 116 17 A colorless liquid, d 0 761, b 112, insoluble in water, miscible with alcohol or ether **e isobutylether** $EtOC_4H_9$ = 102 15 A colorless liquid, d 0 751, b 78, insoluble in water, miscible with alcohol or ether **e isobutylketone** $EtCOC_4H_9$ = 114 16 2-methylhexane-4-one A colorless liquid, $d_{17°}$ 0 815 b 136, insoluble in water, miscible with alcohol or ether **e isobutyrate** $C_6H_{12}O_2$ = 116 13 Ethyl dimethylacetate, Me_2CH COOEt A colorless liquid, $d_{20°}$ 0 869, b 110, slightly soluble in water, miscible with alcohol or ether **e isocyanate** See *e cyanate* **e isocyanide** EtNC = 55 1 E carbylamine* A colorless liquid, $d_{4°}$ 0 759, b 79, soluble in water alcohol or ether **e isophthalate** $C_6H_4(COOEt)_2$ = 222 2 A colorless, oily liquid, m 0, b 285 **e isopropylacetoacetate** $C_9H_{16}O_3$ = 172 18 The ester MeCO CH(CH_3 Me_2) COOEt A colorless liquid, $d_{20°}$ 0 947, b 200, slightly soluble in water, miscible with alcohol or ether **e isopropylether** $C_5H_{12}O$ = 88 13 Isopropyl ethoxide, Me_2CHOEt A colorless liquid, $d_{9°}$ 0 745, b 54, soluble in water, alcohol, or ether **e isopropylketone** $C_6H_{12}O$ = 100 13 2-methyl-pentan-3-one, Me_2CH CO Et A colorless liquid, $d_{0°}$ 0 830, b 114 5, slightly soluble in water or alcohol, miscible with ether **e isosuccinate** $C_8H_{14}O_4$ = 174 15 The ester MeCH(COOEt)$_2$ A colorless liquid, d 1 021, b 198, sparingly soluble in water, miscible with alcohol or ether **e isosulfocyanate** See *e thiocyanate* **e isothiocyanate** See *e thiocyanate* **e isovalerate** $C_7H_{14}O_2$ = 130 16 The ester Me_2CHCH_2-COOEt A colorless liquid, d 0 872, b 134 3, insoluble in water, miscible with alcohol or ether **e kairine** See *kairine* **e ketone** Diethyl ketone **e lactate** $C_5H_{10}O_3$ = 118 1 Ethyl-*α*-hydroxypropionate, MeCH(OH)COOEt A colorless liquid, $d_{19°}$ 1 032, b 154, soluble in water, ether, or alcohol Used as a solvent for nitrocellulose and resins in the manufacture of lacquers **e laurate** $C_{14}H_{26}O_2$ = 226 3 Colorless crystals, soluble in alcohol or ether **e malate** $C_8H_{14}O_5$ = 190 15 The ester EtOOC CH_2 CHOH COOEt A colorless liquid, $d_{25°}$ 1 124, b 248, miscible with water, alcohol, or ether Used as a constituent of lacquers **e malonate** $C_7H_{12}O_4$ = 160 14 The ester $CH_2(COOEt)_2$ A colorless liquid, d 1 061, m −50, b 198, slightly soluble in water, miscible with alcohol or ether, used as plasticizer for cellulose acetate **e malonic acid** $C_5H_8O_4$ = 132 07 The acid $EtCH(COOH)_2$ Colorless rhombic prisms, m 111, decomp 160, soluble in water alcohol, or ether, isomeric with dimethylmalonic acid, methyl-succinic acid, and glutaric acid **e mannite** $C_{10}H_{10}O_5$ = 210 1 A substitution product of mannite, a colorless syrupy liquid **e melamine** E cyanamide **e mercaptan** C_2H_6S = 62 11 Thioethylalcohol, e hydrosulfide, ethanethiol*, EtSH A colorless liquid, $d_{20°}$ 0 839, m −144, b 37, slightly soluble in water, miscible with alcohol or ether It is one of the odorous constituents of feces **e mercaptide** A compound of the general type, Et S M, where M is a monovalent metal **e mercuric chloride** EtHgCl = 265 11 Silvery, iridescent leaflets, d 3 5, m 192 5, insoluble in water **e mercuric hydroxide** EtHgOH = 246 66 Silvery, iridescent leaflets, m 190 insoluble in water **e metanilic acid** C_6H_{11}-NO_3S = 201 0 C_6H_4NHEt SO_3H Colorless needles, decomp 294 **e methyl acetic acid** $C_5H_{10}O_2$ = 102 11 Methyl ethyl acetic acid, Et CH Me COOH A liquid b 175 **e methylether** C_3H_8O = 60 1 Ethyl methyloxide Et O Me A colorless volatile liquid, used medicinally as an anesthetic **e monotartrate** $C_6H_{10}O_6$ = 178 11 Colorless rhombic crystals, m 90, soluble in water or alcohol **e morphine hydrochloride** Dionine **e mustard oil** E isothiocyanate (see *e thiocyanate*) **e naphthalene** $C_{12}H_{12}$ = 156 16 Naphthylethane, C_{10}-H_7Et **(alpha-)** A colorless liquid, $d_{15°}$ 1 064 b 256, insoluble in water, miscible with alcohol or ether **(beta-)** A colorless liquid, $d_{0°}$ - 1 008, m −19, b 251, insoluble in water miscible with alcohol or ether **e naphthylamine** $C_{12}H_{13}N$ = 171 21 Ethylamine-naphthalene EtNH $C_{10}H_7$ **(alpha-)** A colorless liquid, b 303 **(beta-)** A colorless liquid b 305 **e naphthylether** $C_{12}H_{12}O$ = 172 16 Ethoxynaphthalene, $C_{10}H_7$(OEt) **(alpha-)** A colorless liquid, m 5 5, b 272, insoluble in water, miscible with alcohol or ether **(beta-)** Bromelia Colorless crystals, m 37, b 274, insoluble in water, slightly soluble in alcohol, soluble in ether **e nicotine** A substitution product of nicotine **e nitramine** See *nitramine* **e nitrate** $EtNO_3$ or $C_2H_5O_3N$ = 91 09 Aether nitricus, EtO NO_2 A colorless liquid, d 1 116, d 1 116, m −112, b 87 6, insoluble in water,

miscible with alcohol or ether **e nitrite.** $EtNO_2$ or $C_2H_5O_2N$ = 75 09 Aether nitrosus Sweet spirits of niter EtO NO A colorless liquid, d 0 900, b 17, slightly soluble in water, miscible with alcohol or ether Used medicinally as a 15 % alcoholic solution, as a diuretic and diaphoretic Cf *nitroethane* **e nitrobenzoate** $C_9H_9O_4N$ = 195 16 $NO_2C_6H_4$-COOEt **(ortho-)** Colorless triclinic crystals, m 30, soluble in alcohol or ether **(meta-)** Colorless prisms m 48, insoluble in water, soluble in alcohol or ether **(para-)** Colorless crystals, m 57, soluble in alcohol or ether **e nitrocarbamate** Urethane **e nitrolic acid** $C_2H_4O_3N_2$ = 104 12 $MeC(NOH)NO_2$ Yellow, rhombic crystals, m 86 (decomp), soluble in water, alcohol, ether, or alkalis **e nonylate** $C_{11}H_{22}O_2$ = 186 2 E pelargonate, oenanthic ether, e pelargonic ester $C_8H_{17}COOEt$ A colorless liquid of stupefying, wine-like odor and acrid taste, $d_{17°}$ 0 8635, b 227, insoluble in water soluble in alcohol or ether, used in flavoring extracts in place of wine and cognac essences **e oenanthate** $C_9H_{18}O_2$ = 158 2 Cognac oil The ester $C_6H_{13}COOEt$ A colorless, oily liquid and a constituent of old wines, used in flavoring extracts **e orthoacetate** $C_8H_{18}O_3$ = 162 2 Triethoxyethane, acetyltriethyl ether $MeC(OEt)_3$ **e orthocarbonate** $C_9H_{20}O_4$ = 192 2 Tetraethoxymethane $C(OEt)_4$ **e orthoformate** $C_7H_{16}O_3$ = 148 2 Triethoxymethane, formyltriethyl ether, acton $CH(OEt)_3$ **e orthophosphate** See *e phosphate* **e orthosilicate** See *e silicate* **e oxalate** $C_6H_{10}O_4$ = 146 10 The ester $(COOEt)_2$ A colorless liquid, d 1 085, b 186, slightly soluble in water, miscible with alcohol or ether **e oxalurate** $C_5H_8O_4N_2$ = 160 1 Oxaluric e ester $NH_2CO\,NH\,CO\,COOEt$ **e oxamate** $C_4H_7O_3N$ = 117 1 Oxaminic e ester, oxamethane, ethyl oxamide, $NH_2CO\,COOEt$ Colorless crystals, soluble in alcohol **e oxanilate** $C_{10}H_{11}O_3N$ = 193 1 Oxanilic e ester, $PhNH\,CO\,COOEt$ Colorless crystals, soluble in alcohol or ether **e oxide** Ether **e oxydithiocarbonic acid** Xanthic acid **e palmitate** $C_{15}H_{31}COOEt$ = 284 39 Colorless needles, m 24 2, insoluble in water, soluble in alcohol or ether **e pelargonate** E nonylate **e pentasulfide** $C_4H_{10}S_5$ = 218 39 Et_2S_5 **e perchlorate** $C_2H_5ClO_4$ = 128 5 Perchloric ether A colorless, explosive liquid with a sweet, pleasant odor **e perchloride** Hexachloroethane **e peroxide** Diethyldioxide **e persulfide** E disulfide **e phenacetin** See *phenacetin* **e phenate** Phenetol **e phenol** $C_8H_{10}O$ = 122 12 $Et\,C_6H_4OH$ **(ortho-)** Phlorol, 1 2- A colorless liquid, $d_{0°}$ 1 037, b 206 8, soluble in alcohol or ether **(para-)**, 1 4- Colorless needles, m 47, b 214, insoluble in water, soluble in alcohol or ether **e phenylacetate** $C_9H_{12}O_2$ = 164 15 The ester $PhCH_2COOEt$ A colorless liquid, d 1 086, b 229, insoluble in water, miscible with alcohol or ether **e phenylacetylene** $C_{10}H_{10}$ = 130 10 The unsaturated aromatic hydrocarbon PhC CEt A colorless liquid, $d_{21°}$ 0 923, b 202 soluble in alcohol **e phenylcarbinol** $C_9H_{12}O$ = 136 11 Ethyl phenylhydroxymethane,



A colorless liquid, $d_{15°}$ 0 992, b 212, insoluble in water, miscible with alcohol or ether **e phenylcinchonate** Acitrin **e phenylether** Phenetole **e phenylhydrazine** $C_8H_{12}N_2$ = 136 16 **(alpha-)** $PhNEt\,NH_2$ A colorless, oily liquid, b 237, soluble in alcohol **(beta-)** $PhNH\,NHEt$ A colorless, oily liquid, sparingly soluble in water, miscible with alcohol or ether **e phenylketone** $C_9H_{10}O$ = 134 13 The aromatic ketone PhCOEt Colorless leaflets, d 1 015, m 15, b 218, insoluble in water, soluble in alcohol or ether **e phenylsulfone** $C_8H_{10}O_2S$ = 170 21 $PhSO_2Et$ Colorless monoclinic scales, m 42, b above 300, sparingly soluble in water, soluble in alcohol or ether **e phenylurea** $C_9H_{12}ON_2$ = 164 23 $PhNH\,CO\,NHEt$ Colorless needles, m 99, insoluble in water, soluble in alcohol **e phosphate** Ethyl phosphoric acids **(di-)** See 2 **(mono-)** See 1 **(normal-)** See 3 **(pyro-)** See 4 **(tetra-)** See 4 **(tri-)** See 3 (1) $C_2H_5H_2PO_4$ = 126 06 Monoethylphosphoric acid, ethyl phosphoric acid, monoethyl phosphate A dibasic acid, a colorless, oily liquid, forming metallic salts (ethylphosphates) (2) $(C_2H_5)_2HPO_4$ = 154 09 Diethylphosphoric acid, diethylic phosphate A monobasic acid, a colorless syrupy liquid which forms a series of crystalline salts (diethylphosphates) (3) $(C_2H_5)_3PO_4$ = 182 15 E phosphate, triethylic phosphate A colorless aromatic liquid, b 215, decomp in water, soluble in alcohol or ether (4) $(C_2H_5)_4P_2O_7$ = 290 16 E pyrophosphate, tetraethylic phosphate A colorless, oily liquid having a peculiar odor **e phosphine** C_2H_7P = 62 11 $EtPH_2$ A colorless liquid, b 25 **e phosphinic acid** $C_2H_5H_2PO_2$ = 110 1 Et-PO $(OH)_2$ An isomer of ethyl phosphite (1) **e phosphite** E phosphorous acids (1) $C_2H_5H_2PO_3$ = 110 06 Acid ethyl phosphite, ethyl phosphorous acid A dibasic acid, forming the ethylphosphites (2) $(C_2H_5)_2HPO_3$ = 138 09 Diethylphosphite, diethylphosphorous acid A monobasic acid, forming diethyl phosphites (3) $(C_2H_5)_3PO_3$ = 166 12 Normal ethyl phosphite, triethylphosphite A colorless liquid of disagreeable odor (4) $(C_2H_5)_2H_2P_2O_5$ = 202 10 E pyrophosphite, e pyrophosphorous acid A dibasic acid forming ethylpyrophosphites **e phosphoric acid** See *e phosphate* **e phosphorous acid** See *e phosphite* **e phthalate** $C_6H_4(COOEt)_2$ = 222 17 A colorless liquid, $d_{0°}$ 1 118, b 295, insoluble in water, soluble in alcohol or ether **(iso-)** See *e isophthalate* **(meta-)** *E isophthalate* (ortho-) *E phthalate* **(para-)** E terephthalate **(tere-)** See *e terephthalate* **e piperidine** $C_7H_{15}N$ = 113 2 A synthetic, a derivative of piperidine **e platinocyanide** $Et_2Pt(CN)_4\,2H_2O$ = 393 50 Yellowish crystals **e propiolate** $C_5H_6O_2$ = 98 07 The ester HC CCOOEt A colorless liquid b 119, insoluble in water, miscible with alcohol or ether **e propionate** $C_5H_{10}O_2$ = 102 11 The ester $EtCOOEt$ A colorless liquid, d 0 896, b 98 3, slightly soluble in water, miscible with alcohol or ether, used in perfumery **e propyl** Pentane **e propylcarbinol** $C_6H_{14}O$ = 102 15 Hexan-3-ol, $Pr\,CHOH\,Et$ A colorless liquid, $d_{20°}$ 0 819, b 135, miscible with alcohol **e propylene** Amylene **e propylether** $C_5H_{12}O$ = 88 13 Ethylpropyloxide, $Et\,O\,Pr$ A colorless liquid, $d_{0°}$ 0 755, b 60, slightly soluble in water, miscible with alcohol or ether **e**

propylketone $C_6H_{12}O$ = 100 13 Hexan-3-one, Et CO Pr A colorless liquid, $d_{18°}$ 0 818, b 122, sparingly soluble in water, miscible with alcohol or ether **e pseudocyanate** E isocyanate **e pyrrole** See *pyrrole* **e pyoctanin** See *pyoktanin* **e pyridine** C_7H_9N = 107 12 α- C_5H_4NEt A liquid, b $_{763mm}$ 123 **e pyruvate** $C_5H_8O_3$ = 116 1 The ketone ester MeCOCOOEt A colorless liquid, d 1 060, b 144, used as a solvent for nitrocellulose **e racemate** An optically-active isomer of ethyl tartrate **e red** $C_{23}H_{23}N_2I$ *1 1*-Diethyl isocyanin iodide A quinoline dye used as photosensitizer **e rhodanate** E thiocyanate **e saccharate** $C_{10}H_{18}O_8$ = 266 2 Saccharic ethyl ester A bitter crystalline compound, soluble in water **e salicylate** $C_9H_{10}O_3$ = 166 13 Sal ethyl HO C_6H_4 COOEt A colorless, volatile liquid of pleasant odor and taste, $d_{20°}$ 1 132, b 231, insoluble in water, miscible with alcohol or ether, used medicinally as an antiseptic, also as a solvent for nitrocellulose **e selenide** $C_4H_{10}Se$ = 137 1 Diethylselenide, Et_2Se A colorless, heavy, oily liquid, b 107 **(di-)** See *e diselenide* **(per-)** See *e diselenide* **e selenomercaptan** C_2H_6Se = 109 1 Ethyl hydroselenide, EtSeH A colorless liquid of disagreeable odor **e silicate** A group of compounds of ethyl and silicic acid (1) $(C_2H_5)_4SiO_4$ = 208 6 Ethyl orthosilicate A colorless, inflammable liquid, an isolog of ethyl orthocarbonate (2) $(C_2H_5)_2SiO_3$ = 134 4 Ethyl metasilicate Colorless liquid, $d_{20°}$ 0 933, b 165, decomp by water An isolog of e carbonate (3) $(C_2H_5)_6Si_2O_7$ = 342 8 E disilicate **e silicon** The trivalent $EtSi\equiv$ radical, silicon monoethide **e stannic acid** EtSnO OH = 180 75 A white powder, insoluble in water **e stearate** $C_{20}H_{40}O_2$ = 312 4 Stearic ethyl ester A waxy substance, insoluble in water, soluble in alcohol **e strychnine** A derivative of strychnine, (q v) **e suberate** $C_{12}H_{22}O_4$ = 230 2 The ester EtOOC $(CH_2)_6$COOEt A colorless liquid of agreeable odor, soluble in alcohol or ether **e succinate** $C_8H_{14}O_4$ = 174 16 The ester $EtOOC(CH_2)_2COOEt$ A colorless liquid, d 1 044, m −20 8, b 216 5, insoluble in water, miscible with alcohol or ether, used as a plasticizer for cellulose acetate **(iso-)** See *e isosuccinate* **e succinic acid** $C_6H_{10}O_4$ = 146 11 The dibasic acid HOOC CH_2 CHEt COOH Colorless prisms, m 98, soluble in water, alcohol, or ether **e succinolactate** $C_{11}H_{18}O_6$ = 246 2 A colorless, oily liquid **e succinylsuccinate** $C_{12}H_{16}O_6$ = 256 2 Light-green, prismatic crystals soluble in water, alcohol, or ether, giving a solution with blue fluorescence **e sulfas** E sulfate **e sulfate** $(C_2H_5)_2SO_4$ = 154 15 Normal ethyl sulfate, diethyl sulfate A colorless, oily liquid with peppermint odor, d 1 184, m −24 5, b 208, insoluble in water, soluble in alcohol **(acid-)** E sulfuric acid **(di-)** E sulfate **(mono-)** E sulfuric acid **e sulfide** $(C_2H_5)_2S$ = 90 15 Diethylsulfide, ethylthioether, ethylthioethane*, Et_2S A colorless, volatile liquid $d_{20°}$ 0 837, m −90 5, b $_{754mm}$92, insoluble in water, miscible with alcohol or ether **(di-)** See *e disulfide* **(di-chloro-)** Mustard gas **(penta-)** E pentasulfide **(per-)** E disulfide **e sulfinic acid** $C_2H_6O_2S$ = 94 11 Ethane sulfinic acid*, Et-SO OH A colorless, syrupy liquid, an isolog of propionic acid **e sulfite** $(C_2H_5)_2SO_3$ = 138 15 $(EtO)_2SO$ A colorless liquid, $d_{0°}$ 1 106, b 161, slightly decomp by water, soluble in alcohol, it is an isolog of e carbonate **e sulfocarbonate** E thiocarbonate **e sulfochloride** C_2H_5SOOCl = 128 60 A colorless liquid, $d_{20°}$ 1 357, m 29, b 122 (decomp), decomp by water **e sulfocyanate, -ide** E thiocyanate **e sulfohydrate** E mercaptan **e sulfone** $C_4H_{10}O_2S$ or Et_2SO_2 = 122 15 Ethyl sulfonyl ethane*, diethyl sulfone Colorless, rhombic crystals, d 1 357, m 73, b 248 sparingly soluble in water **e sulfonic acid** $C_2H_6O_3S$ or $EtSO_2OH$ = 110 11 Ethane sulfonic acid* Colorless, deliquescent crystals, soluble in alcohol, water, ether, or alkalis **e sulfonic chloride** $C_2H_5O{\cdot}SCl$ or $EtSO_2Cl$ = 128 55 Ethane sulfonyl chloride*, sulfonyl chloride A colorless liquid b 177 decomp by water or alcohol miscible with ether **e sulfonic oxide** E sulfoxide **e sultoxide** Et_2SO or $C_4H_{10}OS$ = 106 20 Ethyl sulfinyl ethane* A colorless liquid, miscible with alcohol, m 4−6 b $_{15mm}$ 88 **e sulfuric acid** $C_2H_6O_4S$ or $EtHSO_4$ = 126 09 Monoethyl sulfate, acid ethylsulfate, sulfovinic acid, e hydrogen sulfate A colorless, syrupy liquid, $d_{16°}$ 1 316, decomp by heat or water, miscible with alkalis Used medicinally as its salts, and technically for precipitating casein from milk **e sulfurous acid** $C_2H_6O_3S$ or $EtHSO_3$ = 110 1 Monoethylsulfite, acid ethylsulfite EtO SO OH **e tartrate** $C_8H_{14}O_6$ = 206 16 Ethyl racemate diethyltartrate The ester $EtOOC(CH_2OH)_2COOEt$ A colorless liquid, d 1 209, b 280, slightly soluble in water, miscible with alcohol or ether Used as solvent for nitrocellulose, gums and resins **e tartronic acid** $C_5H_6O_5$ = 146 05 Colorless, triclinic scales, m 116, decomp on further heating soluble in water, alcohol, or ether **e telluride** $C_4H_{10}Te$ or Et_2Te = 185 5 Tellurium ethyl, diethyl telluride A heavy, oily, reddish liquid giving off yellow fumes **(di-)** Et_2Te_2 = 313 1 Diethylditelluride, ethylpertelluride A dark-red liquid, decomp by water **e terephthalate** $C_6H_4(COOEt)_2$ = 222 17 Ethyl-p-phthalate A colorless liquid, b 119, insoluble in water, miscible with alcohol or ether **e thioalcohol** E mercaptan **e thiocarbamide** $C_3H_8N_2S$ = 104 1 E thiourea EtNH CS-NH_2 **e thiocarbimide** E isothiocyanate (see *e thiocyanate*) **e thiocarbonate** (1) $C_5H_{10}O_2S$ = 134 14 $CS(EtO)_2$ A liquid, d-1 028, b 162 (2) $C_5H_{10}S_3$ = 166 1 $(EtS)_2$-CS A yellow, oily liquid of unpleasant odor, an isolog of ethyl carbonate and ethyl sulfite **e thiocyanate** C_2H_5SCN = 87 15 E rhodanate, e sulfocyanide A colorless liquid, d 1 007, b 148, insoluble in water, miscible with alcohol or ether **(iso-)** C_2H_5NCS = 87 15 E mustard oil A colorless liquid, $d_{23°}$ 0 995 m −5 9 b $_{753mm}$131, insoluble in water, miscible with alcohol or ether **e tin tribromide** $EtSnBr_3$ = 387 49 Colorless needles, m 310, soluble in water **e toluate** $C_{10}H_{12}O_2$ = 164 15 The ester MeC_6H_4COOEt **ortho-** Ethyl-1 2-toluate A colorless liquid d 1 039, b 221, insoluble in water, miscible with alcohol or ether **meta-** Ethyl-1 3-toluate A colorless liquid, b 228, insoluble in water, miscible with alcohol or ether **para-** Ethyl-1 4-toluate A colorless liquid b 229, insoluble in water miscible with alcohol or ether **e toluene** E methyl *benzene* **e urea** See *urea* **e**

urethane See *urethane* **e valerate** $C_7H_{14}O_2$ = 130 16 E valeriate, e valerianate, Bu-COOEt A colorless liquid, $d_{20°}$ 0 877, b 144 5, insoluble in water, miscible with alcohol or ether **e vanillate** $C_{10}H_{12}O_4$ = 196 15 Colorless crystals, m 44, b 292, insoluble in water, soluble in alconol or ether **e vanillin** See *vanillin* **e vinyl ether** C_4H_8O = 72 08 The ether $C_2H_5O\,C_2H_3$ A colorless liquid, $d_{14.5°}$ 0 7625, b 35 5, soluble in alcohol or water **e violet** A hydrogen ion indicator changing at pH 2 0 from blue-green (acid) to purple (alkali) **e xylene** Dimethyl ethyl *benzene*

ethylal Acetaldehyde

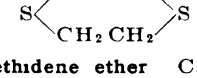
ethylamine See *ethyl amine*

ethylate An alcoholate or ethoxide A compound derived from ethanol by replacing the hydrogen of the hydroxy group by a monovalent metal (M) *e g* , MOEt EtONa, sodium ethylate EtOK, potassium ethylate Cf *ethoxide, alcoholate*

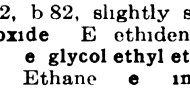
ethylation The introduction of an ethyl group into a compound

ethylene (1) Ethene* (2) Acetene Elayl The divalent —$CH_2\,CH_2$—, or C_2H_4= radical Cf *ethylidene* **azi-** Diazoethane **bromo-** Vinyl bromide **chloro-** Vinyl chloride **di-** See *diethylene* **dichloro-** Acetylene chloride **diethyl-** Δ^3-Hexylene **dimethyl-** ψ-Butylene **diphenyl-** Stilbene **keto-** Ketene **pentyl-** Heptene **perchloro-** See *tetrachloroethylene* **phen-, phenyl-** Styrolene **tetrachloro-** q v **tetraiodo-** Diiodoform **tetraphenyl-** q v **trimethyl-** Pental **vinyl-** Bivinyl

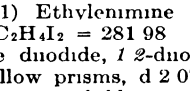
e acetate $C_6H_{10}O_4$ = 146 11 Glycol diacetate The ester $MeCOOCH_2\,CH_2OOCMe$ A colorless liquid, $d_0°$ 1 128, b 186, soluble in water, alcohol, or ether **e alcohol** E glycol **e aldehyde** Acrolein **e benzoate** $C_{16}H_{14}O_4$ = 270 1 The ester $Ph\,COO\,CH_2\,CH_2OOC\,Ph$ Colorless, rhombic prisms, m 73, b 360, insoluble in water, soluble in ether **e bichloride** E chloride **e bromide** $C_2H_4Br_2$ = 187 96 Glycol dibromide, bromoethylene, e dibromide, 1 2-dibromoethane*, $BrCH_2\,CH_2Br$ A colorless liquid, d 2 189, m 9 b 131, slightly soluble in water, miscible with alcohol or ether Used as an anesthetic and in organic synthesis, also added to ethyl-gasoline, q v **e bromohydrin** Glycol bromohydrin **e carboxylic acid** Acrylic acid **e chlorohydrin** C_2H_5OCl = 80 06 Chlorethylalcohol, 2-chlorethanol, 1-hydroxy-2-chlorethane $ClCH_2\text{-}CH_2OH$ A colorless liquid, $d_8°$ 1 28, m −69, b 128, miscible with water, alcohol, or ether Used in organic synthesis, and for the forced sprouting of plants *commercial-* A 40 % solution, d 1 097, b 96, used in chemical synthesis for introducing the hydroxy-ethyl group into a molecule (*e g* novocaine) **e chloride** $C_2H_4Cl_2$ = 98 94 Glycol dichloride, elaylchloride, ethene dichloride, 1 2-dichlorethane*, vinylene chloride, Dutch liquid, $ClCH_2\,CH_2Cl$ A colorless liquid, d 1 2569, m −35 3, b 83 7, slightly soluble in water or alcohol, miscible with ether Used in organic synthesis, as a solvent for lacquers, as an extractive for fats and oils, as a spotting agent for removal of tar, paint, etc from textiles, alone or with carbon dioxide as an insecticidal fumigant for foodstuffs Cf *dichloroethylene* **1 1-** Ethylidene chloride **e cyanohydrin** C_3H_5ON = 71 07 Glycol cyanhydrin, 2-cyano-ethanol, 1-hydroxy-2-cyanoethane A colorless liquid, $d_0°$ 1 059, m 221, miscible with alcohol, water, or ether **e cyanide** $C_4H_4N_2$ = 80 07 Succinonitrile e dicyanide, e dicarbonitrile, glycol dicyanide, 1 2-dicyanoethane Colorless crystals, m 54 b 265, soluble in water, alcohol, or ether **e diamine** $C_2H_8N_2$ = 60 09 Diaminoethane *1 2*-ethane diamine*, $NH_2CH_2\,CH_2NH_2$ A constituent of ptomaines Colorless liquid or crystals, d 0 87, m 10, b 117, soluble in water alcohol, or ether Cf *sublamine* **e dibenzamide** See *dibenzamide* **e dibromide** See *e bromide* **e dicarbonitrile** E cyanide **e dicarboxylic acid** *cis-* Maleic acid *trans-* Fumaric acid **e dichloride** E chloride **e dicyanide** E cyanide **e diethylate** $C_6H_{14}O_2$ = 118 1 Diethylglycolether $EtO\,CH_2\text{-}CH_2OEt$ **e dihydrate** E glycol **e diiodide** E iodide **e dinitrate** E nitrate **e dinitrite** E nitrite **e dioxide** Dioxan **e dioxy** The bivalent radical —$OCH_2\,CH_2O$— **e diphenate** E diphenylether **e diphenyldiamine** $C_{14}H_{16}N_2$ = 212 17 Colorless crystals, m 59, insoluble in water, soluble in alcohol or ether **e diphenylether** $C_{14}H_{14}O_2$ = 214 19 E diphenate Colorless crystals m 98 5, sparingly soluble in water, soluble in alcohol or ether **e disulfhydrate** E mercaptan **e disulfonic acid** E sulfonic acid **e dithioethidene** $C_4H_8S_2$ = 120 1 The heterocyclic compound



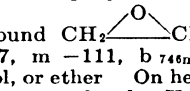
b 173 **e ethidene ether** $C_4H_8O_2$ = 88 07 Ethyl ethylidene oxide The heterocyclic compound



A colorless liquid, $d_0°$ 1 002, b 82, slightly soluble in water **e ethylidenoxide** E ethidene ether **e glycol** Glycol **e glycol ethyl ether** Cellosolve **e hydride** Ethane **e imide** C_2H_5N = 43 1 The heterocyclic compound

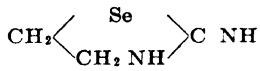


e imine (1) Ethylenimine (2) Piperazine **e iodide** $C_2H_4I_2$ = 281 98 Glycol diiodide, diiodoform, e diiodide, *1 2*-diiodoethane*, $CH_2\text{-}I\,CH_2I$ Yellow prisms, d 2 07, m 81, slightly soluble in water, soluble in alcohol or ether, used medicinally as an iodoform substitute **e mercaptan** $C_2H_6S_2$ = 94 20 Glycol sulfohydrate, e disulfhydrate, glycol mercaptan dithioethylene glycol, $HSCH_2\,CH_2\,SH$ A colorless liquid, $d_{23°}$ 1 123, b 146, soluble in alcohol or ammonia **e monoacetate** Glycol acetate **e naphthalene** Acenaphthene **e nitrate** $C_2H_4O_6N_2$ = 152 12 Glycol dinitrate, e dinitrate, $(CH_2NO_3)_2$ A yellow liquid, $d_8°$ 1 483, explodes when heated or hammered, insoluble in water, soluble in alcohol **e nitrite** $C_2H_4O_4N_2$ = 120 12 Glycol dinitrite, $(CH_2NO_2)_2$ A colorless liquid, $d_0°$ 1 216, b 96, insoluble in water, miscible with alcohol or ether **e oxide** C_2H_4O = 44 04 Dimethylene oxide, *1 2*-epoxyethane* The heterocyclic compound



A colorless gas, $d_0°$ 0 897, m −111, b $_{746mm}$14, soluble in water, alcohol, or ether On heating in aqueous solution it forms e glycol Used as an insecticide and fumigant to destroy weevils and

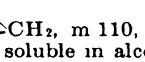
other insects, injected into the soil to kill barberry, other weeds and plants Cf *carboxide* **e oxide sulfone** $C_{14}H_{14}O_4S_2$ = 310 30 $(PhSO_2)_2C_2H_4$ Soluble in alcohol or acid ether, m 179 5 **e perchloride** Carbon dichloride **e periodide** Diiodoform **e rhodanate** E sulfocyanide **e selenurea** $C_3H_6N_2Se$ = 149 3 E pseudoselenourea, imidotetrahydroselenazole The heterocyclic compound



e series Olefines, ethene series, alkenes A group of unsaturated hydrocarbons of general formula C_nH_{2n} which contain one double bond

ethylene, ethene*	C_2H_4
propylene, **propene***	C_3H_6
butylene, **butene***	C_4H_8
amylene, **pentene***	C_5H_{10}
hexylene, **hexene***	C_6H_{12}
heptylene, **heptene***	C_7H_{14}
octylene, **octene***	C_8H_{16}
nonylene, **nonene***	C_9H_{18}
decylene **decene***	$C_{10}H_{20}$
cetene, hexadecene*	$C_{16}H_{32}$
eicosene*	$C_{20}H_{40}$
cerotene, hepteicosene*	$C_{27}H_{54}$
melene, triacontylene*	$C_{30}H_{60}$

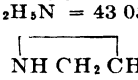
e sulfate (acid-) $C_2H_4(HSO_4)_2$ = 222 1 Ethylenesulfuric acid A colorless, syrupy liquid **(basic-)** $(OH)C_2H_4(HSO_4)$ = 142 1 Ethylenehydroxysulfuric acid An acid known only as its compounds **e sulfide** C_2H_4S = 60 06 or $(C_2H_4S)_2$ The heterocyclic compound



m 110, sublimes 200, insoluble in water, soluble in alcohol or ether **e sulfocyanide** $C_2H_4(SCN)_2$ = 144 21 E thiocyanate Colorless rhombic crystals, m 90, sparingly soluble in water, soluble in alcohol **e sulfonic acid** Ethionic acid **e sulfuric acid** See *e sulfate* **e tetrabromide** Tetrabromoethane **e tetrachloride** Tetrachloroethane **e trichloride** Trichloroethylene **e thiocyanate** E sulfocyanide **e trichloride** Trichloroethylene **e urea** $C_3H_6ON_2$ = 86 09 Colorless needles, m 131, soluble in water, alcohol, ether or chloroform

ethylene glycol See *glycol*

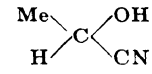
ethylenimine C_2H_5N = 43 05 Azirane



Cf *piperazine*

ethylic acid Acetic acid

ethylidene Ethidene The bivalent MeCH=, or CH_3CH= radical from ethane, isomeric with ethylene **e acetone** C_5H_8O = 84 09 The liquid ketone MeCO CH = CH Me, $d_{15°}$ 0 86, b_{741mm}122 **e bichloride** E chloride **e bromide** $C_2H_4Br_2$ = 187 96 E dibromide, $MeCHBr_2$ 1 1′-dibromoethane* A colorless liquid, d 2 100, m 112, insoluble in water, miscible with alcohol or ether **e chloride** $C_2H_4Cl_2$ = 98 94 Ethylidene dichloride, ethylidene perchloride, 1 1′-dichloroethane*, chlorinated hydrochloric ether A colorless liquid, d 1 178, b 59, sparingly soluble in water, miscible with alcohol or ether **e cyanhydrin** $C_2H_4(OH)CN$ = 71 08 1-cyanoethanol lactonitrile



1-hydroxy-1′-cyanoethane A colorless liquid, m −12, b 182 (decomp), miscible with water, alcohol, or ether **e dichloride** E chloride **e diiodide** E iodide **e glycol** $Me\,CH(OH)_2$ Known only in its derivatives, *e g*, chloral hydrate **e iodide** $C_2H_4I_2$ = 281 98 E diiodide, 1 1-diiodoethane*, $MeCHI_2$ A colorless liquid $d_0°$ 2 84, b 178, insoluble in water, miscible with alcohol or ether **e lactic acid** Lactic acid **e perchloride** E chloride **e urea** $C_3H_6ON_2$ = 86 15 Colorless needles, m 126, decomp 165, slightly soluble in water, soluble in alcohol or ether **e urethane** $C_8H_{16}O_4N_2$ = 204 2 Colorless needles, m 125, decomp on further heating, soluble in water, alcohol, or ether

ethylin A compound derived from glycerol by substituting one or more ethoxy groups for the hydroxy group **mono-** $C_3H_5(OH)_2OEt$ = 118 1 A colorless liquid, b 230 **di-** $C_3H_5OH(Et)_2$ = 146 1 **1 3-** Diethyl glycerol **1 2-** Diethylin **tri-** $C_3H_5(OEt)_3$ = 174 2 A colorless liquid, b 185

ethylogen A complex carbide, from which water liberates ethylene slowly

ethyloic Having $—CH_2COOH$ as a sidechain Cf *methyloic, propyloic*

ethylol Oxethyl The $CH_2OH\,CH_2—$ radical Cf *ethoxy*

ethyne* Acetylene

ethynyl* The radical HC C— **e bromide** Bromoacetylene

etiline Tetrachloroethane

etiology The study pertaining to the cause or origin of a disease

etiophyllin $C_{31}H_{34}N_4Mg$ = 457 58 Aetiophyllin The decarboxylated magnesium base of chlorophyll Blue tablets, m 205 See *porphin derivatives*

etioporphyrin $C_{31}H_{34}N_4$ = 435 26 A magnesium tetrapyrrole derivative from chlorophyll and hemoglobin See *porphin* Violet crystals, m 280

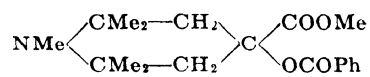
Ettinghausen effect The galvanomagnetic change in temperature of a plate through which a current is flowing The effect is positive when the upper edge of a metal plate, placed between two magnetic poles, has a higher temperature the electric current flowing from left to right Cf *Hall, Leduc,* and *Nernst effects*

ettringite $Ca_{12}Al_4(OH)_{24}(SO_4)_6\,5H_2O$ A mineral found in the contact zones of chalk and dolomite, in Ireland

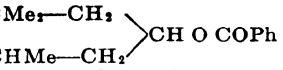
Eu The symbol for europium

eu-chlorine A mixture of chlorine and chlorine dioxide obtained from potassium chlorate and concentrated hydrochloric acid

eucaine A $C_{19}H_{27}O_4N$ = 333 3 Tetramethyl-N-methyl-β-benzoxypiperidine-γ-carboxylic ester, α-eucaine



Colorless crystals, m 103, used medicinally as an anesthetic and substitute for cocaine **e B** $C_{15}H_{21}O_2N$ = 247 17 β-eucaine, benzamine, betacaine, trimethyl benzoyl-oxy-

piperidine 

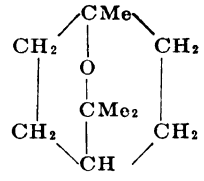
Colorless crystals, m 91, used as a local anesthetic

e hydrochloride α- $C_{19}H_{27}O_4N$ HCl = 368 8 Colorless crystals m 200, soluble in water, used as an anesthetic β- $C_{15}H_{22}O_2$-NCl = 283 64 Colorless crystals, m 268

eucairite CuAgSe A silverwhite, metallic, isometric copper silver selenide

eucalin $C_{12}H_{12}O_6$ = 252 1 A disaccharide produced by the hydrolysis of melitose It is non-fermentable and resembles inositol Cf *eucalyptolene*

eucalyptene $C_{10}H_{16}$ = 136 2 A terpene derived from eucalyptol A colorless liquid, b 170, soluble in alcohol, used as an antiseptic

eucalyptole $C_{10}H_{18}O$ = 154 20 Cineole, cajeputole  A colorless liquid,

$d_{20}°$ 0 927, m −1, b 176, insoluble in water, miscible with alcohol or ether A chief constituent of eucalyptus and cajeput oils, used medicinally as an antiseptic, antispasmodic, antiperiodic, and expectorant

eucalyptolene $C_{10}H_{16}$ = 136 2 An isomer of eucalyptene, and a constituent of eucalyptus oil A heavy, yellowish liquid, b 300, miscible with alcohol

eucalyptus (1) A genus of trees of the Myrtaceae Cf *lerp, mallee bark, marri kino* (2) Blue-gum tree The dried leaves of *Eucalpytus globulus*, a Myrtaceae originally of Australia, which are used as an antiperiodic, tonic, and antipyretic **e oil** The essential oil distilled from the leaves of various eucalyptus species, varying from peppermint to turpentine in odor The chief constituents are eucalyptole, pinene, capronaldehyde, valeraldehyde, butyraldehyde A colorless or slightly yellowish liquid, d 0 91–0 93, miscible with alcohol or ether, used medicinally as an internal or external antiseptic

eucasin Ammonium caseinate

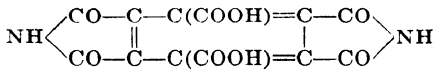
eucasol Anytol

eucatropine Euphthalmine

eucazulene $C_{15}H_{18}$ = 198 14 A blue liquid hydrocarbon from eucalyptus oil

euchinine Quinine ethyl carbonate

euchlorine Eu-*chlorine*

euchroic acid $C_{12}H_4O_8N_2$ = 304 1 Mellitic acidimide The heterocyclic compound 

euchroite $Ca_4As_2O_9$ A native, greenish, calcium arsenate, rhombic masses, d 3 4, hardness 3, soluble in nitric acid

eucodal $C_{18}H_{21}O_4N$ = 315 02 Di-hydro-hydroxy codeinone White powder, used as hypnotic

eucodeine $C_{18}H_{21}O_3N$ CH_3 Br = 396 2 Methyl-codeine-bromide White powder, m-261, soluble in water Used medicinally as a sedative

eucol Guaiacol acetate

eucolloid A colloid, the primary valencies of which are satisfied forming particles of chain length over 2500 A (M W over 1000) Cf *mesocolloid*

eucryptite $LiAlSiO_4$ A white, transparent, hexagonal lithium aluminum silicate

euctolite A basaltic rock from Italy

eucupine $C_{24}H_{34}O_2N_2$ = 282 41 *i*-amylhydrocupreine A quinine alkaloid, q v A white powder, insoluble in water, but soluble in alcohol or ether **e hydrochloride** Colorless crystals, soluble in water, used as a powerful bactericide

eudalene $C_{14}H_{16}$ = 186 11 7-Iso-propyl-1-methyl naphthalene A hydrocarbon obtained from eudesmol and selinene by treatment with sulfur

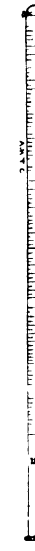
eudeiolite A native calcium-iron-cerium columbate-titanate-thorate A dark-brown, shining mass of d 3 44, hardness 4

eudesmene $C_{15}H_{24}$ = 204 15 A bicyclic sesquiterpene from eucalyptus oil

eudesmol $C_{15}H_{26}O$ = 222 2 2-Isopropyl-8-methylene-10-methyl-decahydronaphthol-2 A phenol from eucalyptus oil

eudialite $Na_{13}(Ca,Fe)_6(Si,Zr)_{20}O_{52}Cl$ A sodium calcium-iron, silicate-chloride

eudiometer A graduated glass tube with platinum electrodes, closed at one end, used to demonstrate or measure volume changes during the combination of gases



Eudiometer

eudiometry Gasometric analysis Gasometry

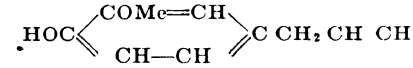
eudoxine $(C_6H_2I_2OBi_2)_3$ COC_6H_4O Bismuth tetraiodophenolphthalein, bismuth nosophene A reddish-yellow, tasteless, odorless powder, insoluble in water, decomposed by alkalis, used medicinally in intestinal irritations

euflavine $C_{14}H_{14}N_3Cl$ = 261 8 2 8-Diamino-10-methylacridinium chloride A dye similar to acriflavine (q v), to which the term is sometimes erroneously applied

eugallol Pyrogallol monoacetate

eugenic acid (1) Eugetinic acid (2) Eugenol

eugenin $C_{10}H_{12}O_3$ = 164 1 An isomer of eugenol, from oil of cloves

eugenol $C_{10}H_{12}O_2$ = 164 15 Allyl-4 3-guaiacol, 2-methoxy-1-hydroxy-4-allylbenzene, 1-allyl-3-hydroxy-4-methoxy benzene 

A constituent of many essential oils such as oil of cloves, cinnamon, an isomer of chavibetol and eugenin A colorless liquid, $d_{18}°$ 1 063, m -10 3, b 253 2, slightly soluble in water, miscible with alcohol or ether Used medicinally as an antiseptic and antituberculosic, technically, in perfumery and for manufacturing vanillin **iso-** Propenyl guaiacol An isomer with the sidechain —CH CH Me A colorless liquid, b 240 **cinnamyl-** E cinnamate **methyl-** $C_{11}H_{14}O_2$ = 178 17 Eugenol methyl ether, allyl 3 4-veratrol, 1 2-methoxy-4-allyl-benzene A colorless liquid, $d_{25}°$ 1 035, b 244, insoluble in water, miscible with alcohol or ether

e acetamide $C_{12}H_{15}O_3N$ = 221 2 Colorless shining scales, m 110, soluble in water or alcohol, used medicinally as an anesthetic **e benzoate** Benzo-eugenol **e cinnamate** $C_{18}H_{18}O_3$ = 282 14 Cinnamyl eugenol Colorless needles, used as antiseptic

eugetic acid Eugetinic acid

eugetinic acid $C_{11}H_{12}O_4$ = 208 10 Eugenic acid eugetic acid $C_6H_2(OH)(OMe)C_3H_5$-COOH Colorless prisms, m 124, sparingly soluble in water, soluble in alcohol or ether

euglenarhodon A xanthophyll carotenoid from certain flagellates

eukairit CuAgSe A native copper and silver selenide

eukinase The desiccated and powdered pancreatic juice of pigs, consisting mainly of trypsin

eulachon oil Candle fish oil The oil of *Thaleichthys pacificus*, candle fish, used as a substitute for cod-liver oil

eulysin $C_{24}H_{36}O_5$ = 404 3 A yellow split-product of decacrylic acid

eulytin $Bi(SiO_4)_3$ A bismuth silicate, d 6 1, hardness 5–6, brownish, yellow, or grayish masses

eumenol A fluid extract from the root of a Chinese Araliaceae, (tang-kui man-mu), used medicinally as an emmenagogue

eumydrine Methyl-atropine nitrate, atropine methylnitrate White, odorless crystals, soluble in water, sparingly soluble in ether or chloroform, used medicinally as a mydriatic, antihidrotic, and antispasmodic

eunatrol Sodium oleate

euonic acid An acid from the bark of *Euonymus*

euonymin Euonymus A glucoside from the bark and root of *Euonymus* species It is a yellow amorphous powder, used medicinally as a cholagogue and cathartic

euonymit Dulcite

euonymoid The combined principle from *Euonymus* A greenish powder, soluble in alcohol, used medicinally as a hepatic stimulant and mild cathartic

euonymus (1) *Euonymus* A genus of shrubs of the Celastraceae (2) Indian arrowroot, wahoo, spindle-tree, burning bush The dried bark of the root of *E atropurpureus*, a Celastraceae, used medicinally in the form of fluid extract as a laxative, cathartic, and diuretic

euosmite $C_{34}H_{29}O_2$ = 469 3 A fossil resin

euparal A synthetic resin, n 1 53, used as substitute for Canada balsam in microscopic work

euparin $C_{12}H_{11}O_3$ = 203 1 A yellow, crystalline principle from the leaves of *Eupatorium purpureum*, a Compositae (purple hemp) used as an aromatic

eupatheoscope An instrument which measures the cooling effect of aircurrents Cf *katathermometer*

eupatirin Stevioside

eupatorin A crystalline glucoside from the leaves of *Eupatorium perfoliatum*, boneset, thoroughwort, and *Eupatorium cannabinum*, hemp-weed, a Compositae of Europe, America, and Asia

eupatorium (1) *Eupatorium* A genus of Compositae

E cannabinum	hemp, agrimony
E perfoliatum	eupatorium (boneset)
E purpureum	queen-of-the-meadow

(2) Indian page, boneset, thoroughwort The dried leaves and flowering tops of *Eupatorium perfoliatum*, used as a diaphoretic tea, tonic and laxative

Euphorbia A genus of plants characterized by their milky juice **e gum** Potato gum A latex gum from the West African *E*, containing about 10 % rubber and 50 % resins Cf *euphorbium* **e pilulifera** Pill-bearing spurge The dried herb of *E pilulifera*, an Euphorbiaceae of the Antilles and Australia It contains glucosides and is used medicinally for asthma and chronic bronchitis

Euphorbiaceae The spurge family, a group of herbs, shrubs or trees usually with a milky acrid juice that in some cases yields rubber

roots	
Stillingia sylvatica	stillingia
Euphorbia species	euphorbium
Euphorbia corrollata	flowering spurge
Euphorbia ipecacuanha	ipecacuanha spurge
Euphorbia resinifera	euphorbium
Jatropha manihot	tapioca
herbs	
Mercurialis annua	mercurialine
Mercurialis perennis	mercurialis
Euphorbia pilulifera	Australian euphorbia
barks	
Croton eluteria	cascarilla bark
seeds	
Ricinus communis	castor-oil seed
	castor-oil
Aleurites fordii	tung oil
Manihot species	cassava, manioc
	cearea rubber
Croton tiglium	croton seed
	croton oil
Curcas purgans	purging nuts
Jatropha species	physic nut
glands	
Mallotus philippinensis	kamala rottlera
plant products	
Hevea brasiliensis	para-rubber

Cf *buxine, drumine, jatrophine, phyllanthine, wagofo, yulocrotine*

euphorbic acid $C_{24}H_{30}O_6$ = 390 3 An acid from the resinous juice of *Euphorbia* species

euphorbin $C_{30}H_{48}O$ = 424 5 A bitter principle from the resinous juice of *Euphorbia* species

euphorbium A resin from *E resinifera* of Morocco, used as an emetic and aperient Cf *euphorbia gum*

euphorine Phenylurethane

euphthalmine $C_{17}H_{25}O_3N$ HCl = 327 7 Eucatropine A synthetic alkaloid, the mandelic acid derivative of eucaine A white powder, m 113, soluble in water, alcohol, or ether Used as a mydriatic

euphurbin $C_{15}H_{24}O$ = 220 2 A crystalline principle from the resinous juice of *Euphorbia resinifera*

euphylline Theophylline ethylene diamine

eupion A constituent of woodtar A clear, aromatic liquid, b 47, used as an antiseptic

eupittone Eupittonic acid

eupittonic acid $C_{19}H_8O_3(OMe)_6$ = 470 3 Pittacol, eupittone, hexamethoxy aurine A hexamethoxylated, amino-dye Orange-yellow needles, decomp 200, soluble in hot alcohol, glacial acetic acid and alkalis, with blue coloration

eupurpuroid The combined principles from *Eupatorium purpureum*, purple boneset, Joe-pye weed, used as a diuretic and renal tonic

eupyrine $C_{18}H_{18}O_6N$ = 328 15 Vanillin ethylcarbonate-p-phenetidine Greenish-yellow crystals, m 87, soluble in alcohol, ether, or chloroform, sparingly soluble in water Used medicinally as an antipyretic

euquinine Quinine ethylcarbonate

eureka burner A self-lighting gas burner of the bunsen type

euresol $C_8H_8O_3$ = 152 06 Resorcin monoacetate, resorcinyl acetate, 3-hydroxy-phenylacetate A yellow, oily liquid, b 283, insoluble in water, soluble in acetone, used medicinally as an antiseptic in skin diseases

eurobin Chrysarobin triacetate A yellowish-red powder, used for skin diseases

europhen $C_{22}H_{29}O_2I$ = 452 1 Diisobutylcresol iodide, isobutyl-o-cresol iodide A yellow, amorphous powder of saffron-like odor, m 110, insoluble in water, soluble in alcohol, ether, chloroform, or oils Used medicinally as an iodoform substitute, as antiseptic, antisyphilitic, and dusting powder

europium Eu = 152 0 Atomic number 63 A rare earth metal discovered (1896) by Demarcay in cerium minerals Its principal valency is three, and its compounds are rose-colored **e nitrate** $Eu(NO_3)_3$ = 338 0 A colorless crystalline powder, which is soluble in water **e oxide** Eu_2O_3 = 352 00 A white powder, insoluble in water or alcohol **e sulfate** $Eu_2(SO_4)_3\,8H_2O$ = 736 2 Colorless crystals, soluble in water

eurybin A glucoside from *Eurybia* (or *Olearia*) *moschata*, of New Zealand

eurythrol An aqueous extract from the spleen of the ox, used medicinally in anemia and chlorosis

euscopol $C_{17}H_{21}O_4N\,HBr$ = 384 11 An optically-inactive scopolamine hydrobromide Colorless crystals, soluble in water or alcohol, m 181, used medicinally as a hypnotic

eustenin Theobromine sodium iodide

eutannin $C_{28}H_{20}O_{19}$ = 660 2 Colorless crystals, used as an intestinal antiseptic Cf *chebulinic acid*

eutectic The alloy of two or more metals in which the proportions of the constituents are such that it has the lowest possible melting point **e alloy** A mixture of metals which solidifies completely at the e temperature **e mixture** A mixture of two or more substances which has the lowest constant melting point of any mixture of its constituents Cf *dystectic mixture* **e temperature** The melting-point of a eutectic mixture Cf *diagram*

euthiochronic acid $C_6H_4O_{10}S_2$ = 300 20 Yellow, quadratic needles, soluble in water, alcohol, or ether

eutropic series A series in which crystalline form and physical constants show a regular variation

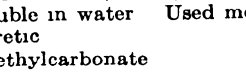
eutropy The progression of the isomorphism of crystals of salts of an element, with the atomic number of the latter

euxanthic acid $C_{19}H_{18}O_{11}\,H_2O$ = 440 16 Purreic acid, hamathionic acid A yellow, crystalline substance from East Indian yellow (purree) Decomp 160, soluble in hot water, alcohol, or ether Cf *coccinic acid*

euxanthin $C_{19}H_{16}O_{10}$ = 404 2 The principal constituent of East Indian yellow, (purree), yellow crystals

euxanthinic acid Euxanthic acid

euxanthone $C_{13}H_8O_4$ = 228 06 Purrone, purrenone, porphyric acid, 1 7-dihydroxyxanthone,



Yellow crystals m 237, soluble in alcohol **iso-** 3 6-Dioxyxanthone Yellow crystals, soluble in alkalis with fluorescence **methoxy-** Gentisin

euxanthonic acid $C_{13}H_{10}O_5$ = 246 08 Yellow needles, decomp 200, soluble in hot water or alkalis

euxantogen Mangiferin

euxenite $(Y,Er,Ce)_2(Ti,Nb)_6Fe(UO)O_{16}$ (Probable formula) Polycrase A rare earth mineral containing helium, germanium and uranium It is a source of Ge, U, Y and Nb

EV An abbreviation for electron-volt

evacuant A purgative or cathartic

evacuate The removal of a gaseous substance from a container, *i e*, to produce a vacuum

evansite $H_6Al_3PO_{10}$ A hydrous aluminum phosphate

evaporate (1) To convert a liquid into its vapor by the application of heat or low pressure (2) To concentrate a solution by removing part of the solvent as gas or vapor

evaporating The act of converting a liquid into its vapor **e burner** A gas burner of cast iron or copper, consisting essentially of a disk with a number of holes by which a large area can be heated **e dishes** A flat or shallow dish of glass, porcelain, or silica, used to contain evaporating solutions

evaporation The process of converting a liquid into a vapor **direct-** Evaporating by means of gas, coal, oil flame, or other direct sources of heat **indirect-** Evaporating by means of steam, water, oil bath, or other indirect sources of heat **latent heat of-** The amount of heat energy absorbed by a unit weight of substance as it passes from the liquid to the vapor state If T is the absolute boiling-point, and E the molecular elevation of boiling point of a solution, then the latent heat of evaporation (L) is given by $L = \frac{0\,02T^2}{E}$ (See *latent heat*) **spontaneous-** Evaporating spontaneously, or by application of sun-heat or air currents (electric fans) **vacuum-** Evaporating in vacuo, *e g*, by exposure to low pressure

evaporator A device to volatilize liquids **solar-** An appliance for evaporating and heating a liquid by infra-red radiation from above, using gas or electricity

evaporimeter An instrument to measure the rate of evaporation of a liquid in terms of the rate of fall in its level

evernesic acid Everninic acid

evernic acid $C_{17}H_{16}O_7$ = 332 13 Colorless needles, m 164, insoluble in water, soluble in alcohol or ether A homolog of lecanoric acid, extracted from *Evernia prunastri*, a lichen

everninе $C_{16}H_{14}O_7$ = 318 11 An amorphous yellow powder, from gums and lichens, soluble in water, alkalis and acids, insoluble in alcohol

everninic acid $C_9H_{10}O_4$ = 182 09 Evernesic acid, 4-methoxy-6-methylsalicylic acid, 2-hydroxy-6-methyl anisic acid An acid derived from lichens Colorless crystals, m 157, soluble

in hot water, alcohol, or ether **ethyl ester of-** Lichenol **methyl ester of-** Sparassol

Everitt's salt Potassium ferrous ferrocyanide

evipan (1) *N*-methylcyclohexenyl methyl barbituric acid, used as an anesthetic (2) Soluble hexabarbitone, used as a basal hypnotic

evodene A terpene from *Evodia rutaecarpa*

evodiamine $C_{19}H_{17}ON_3$ = 303 14 An alkaloid from *Evodia rutaecarpa* Colorless crystals m 278

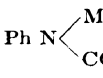
evolution (1) In chemistry, the escape or liberation of a gas (2) In biology the gradual development of a species through many generations, or the gradual change by which new species are formed and develop into higher and more specialized organisms **atomic-** See *spectral* classification

evonymin Euonymin

Ewer and Pick's acid Naphthalene-*1 6*-disulfonic acid

ex- A Greek prefix meaning "out of," or "out from"

exalgin $C_9H_{11}ON$ = 149 1 Methylacetanilide, methylphenyl acetamide, acetmethylanilide Cf *acetotoluide*



Colorless crystals, m 101, sparingly soluble in water, soluble in alcohol or ether, used medicinally as an analgesic and antipyretic

exaltation The amount by which the molecular refractivity of a compound exceeds the sum of the refractivities of its atoms, it is an indication of constitution (presence of double bonds, etc)

exaltone Cyclopentadecanone

examination The investigation of the properties of a substance by chemical or physical means, *e g* , qualitative and quantitative analysis, microscopical, spectroscopical, electrical or biological tests

excelsin A globulin, M W 14,738, from Brazil nuts

excess The use of a larger amount of a reagent than is required for a certain reaction

excidants Stimulants

excipient An inert or indifferent substance, used as a carrier for a medicinal agent, as, starch or milk sugar in tablets

excitation Activation The disturbance of an electron so that it passes from its normal orbit to one of higher energy content as the result of the absorption of radiations Cf *energy levels, lingering period* It differs from ionization in the degree to which the electron is separated, as expressed by the equations

excitation	ionization
a $H_2 + h\nu = H_2^*$	c $H_2 = H_2^+ + e$
b $H_2 + n(h\nu) = 2H^*$	d $H_2 = H^+ + H^-$
	e $H_2 = H + H^+ + e$

where $h\nu$ is a quantum, e an electron, H_2^* an excited and H_2^+ an ionized *molecule*, H^* an excited and H^+, H^- ionized *atoms* On returning from the excited to the normal state the absorbed radiation is emitted, *i e* , the substance is luminescent or fluorescent **photochemical-** Excitation **thermal-** See *thermal*

excited Activated, fluorescent, luminescent **e atom** An atom in which the electrons are moving in elliptical orbits or in higher energy levels than normal **e molecule** (1) An atom in which the valence electrons are in a state of excitation, q v (2) Activated *atom*, q v

excitomotors A group of drugs which excite the nerve-activities

exciton The energy of an electron, which can be passed from one electron to another

exclusion principle *Pauli's principle*

excretin $C_{20}H_{36}O$ = 292 4 A cholesterol-like substance found in human feces Yellow needles, m 96, insoluble in water sparingly soluble in alcohol, soluble in ether

exinite A perhydrous constituent of coal which includes preserved plant structures of a protective nature (*e g* spore cones and cuticles)

exo- A prefix to indicate substitution on a side-chain Cf *endo-*

exocondensation Ring-formation

exocyclic Pertaining to a cyclic compound in which a substitution or a double bond is in the side-chain, that is, outside the ring

exogenous Produced outside **e purines** The purine bodies of excretions which have passed through the system and have their origin in the food eaten, cf *endogenous*

exograph A radiograph obtained by use of x-rays, the film being placed outside the body

exosmosis The diffusion of salts through the plant membrane from the protoplasm into water Antonym endosmosis

exothermic A term indicating the liberation or escape of heat **e compound** A stable compound formed with liberation of heat, as a result of an exothermic reaction **e reaction** A reaction in which heat is liberated It usually proceeds rapidly, sometimes explosively Cf *endothermic*

exotoxin The soluble and poisonous substances of bacteria or parasites

expansion An increase of dimension **adiabatic-** The rapid expansion of a gas with the production of a cooling effect **cubical-** Volume expansion, or increase in three dimensions **linear-** Increase in length **thermal-** The increase in volume due to increase in temperature The rate varies with the temperature and depends on the coefficient of expansion, (q v) It is relatively small for solids and liquids, but large for gases

e equations (1) *Linear* expansion of solids If l_0 is the length at 0°C , x the coefficient of expansion, then the length at t°C is $l_t = l_0(1 + xt)$ The coefficient of expansion is $x = \frac{l_t - l_0}{l_0\ t}$ (2) *Cubical* expansion of solids $l_t = l_0(1 + at + bt)$, where a and b are the first and second coefficients of expansion (3) *Volume* expansion of solids or liquids (approximately) $V_t = V_0(1 + 3xt)$ (4) Expansion of *gases* The volume, V_t, of a gas at temperature t°C is (at constant temperature) for an original volume V_0 at 0°C $V_t = V_0(1 + 0\ 00367t)$ Cf *Charles' Law, gas laws* **e regulators** Thermo-regulators

expectorant A drug which promotes the secretion of mucus from the respiratory tract, *e g* , ipecac, cephaeline, ammonium chloride, lobelia, terpine hydrate

experiment A test or trial to illustrate natural phenomena, or to determine some unknown fact by careful observation and variation of the conditions under which the test is performed It is distinguished from *observation* by the fact that the experimenter arranges the experimental conditions himself beforehand

while an observer must accept the conditions which nature offers **lecture-** An operation carried out in the lecture room to illustrate or demonstrate some chemical or physical fact

experimental Pertaining to knowledge obtained by actual tests, hence, based upon facts, and not speculation

experimentation The performance of experiments

expired air The air given off from the lungs of living organisms, it has less O_2, but more CO_2 and moisture than normal air

exploding atom An atom which is undergoing a radioactive change by the spontaneous emission of electrons or helium nuclei

explosion A sudden, violent, and noisy, exothermic chemical change in which heat, light, and gases are produced Cf fugitive *pressure*

e spectrum See *spectrum*

explosives A group of endothermic compounds or mixtures of substances which cause explosions Generally applied to mixtures used for ordnance, pyrotechnics or mining operations, also, in the construction of roads, canals and tunnels E may be classified into eight groups (Cundill, Dictionary of Explosives)

1 Gunpowders—mixtures of potassium nitrate, sulfur, and charcoal, e g , black powder

2 Nitrate mixtures—Contain another nitrate in place of potassium nitrate, *e g* , barium, or sodium nitrate

3 Chlorate mixtures—Contain potassium chlorate

4 Dynamites—Contain nitroglycerin

5 Gun-cottons—Contain nitro-compounds, *e g* , trinitrotoluol

6 Picrates—Contain picric acid or its derivatives

7 Spreng explosives—Mixtures which are not explosive but becomes so on the addition of an oxidizing substance and detonator

8 Miscellaneous and fulminating mixtures

blasting- An e used in mining **detonating-** High e **high-** Detonating e An e which is more sudden in exploding than gunpowder It possesses high brisance, great shattering power but little propelling power **military-** E used in warfare, as, smokeless, flashless powder, TNT (trinitrotoluene) and TNX (trinitroxylene) **nondetonating-** E which explode like gunpowder **permissible-** Those which pass the safety tests of a government agency (Bureau of Mines Ordnance Dept etc), as, Class A = less than 53 1 , Class B = from 53 to 106 1 , Class C = from 106–158 1 of poisonous gases from 680 gm (1 5 pds) explosive **safety-** E which can be used in coal mines

1 *Simple explosives (PURE substances)*

nitromannite	650*
nitroglycerin	600
nitropentaerythrol	460
tetranitroaniline	400
guncotton	360
hydrazine nitrate	360
tetryl	360
hexanitrophenylsulfide	355
dinitroglycerin	330
hexanitrodiphenylamine	330
trinitrobenzene	330
nitrostarch	305
trinitroanisole	305
picric acid	300
TNT or trinitrotoluene	300
trinitrocresol	275
dinitrobenzene	250
ammonium chlorate	240
ammonium nitrate	140
ammonium perchlorate	140

2a *Compound explosives (BLASTING powders)*

blasting gelatin	500–600
Nobel's explosive	300–540
donarite	400
Kieselguhr dynamite	300–370
Pittsburgh dynamite	280
cheddite	215
silesia explosive	200
carbonites	120–180
black powder	30

2b *Compound explosives (PROPULSIVE powders)*

cordite	725
cannonite	720
shotgun powder	700
amberite	630
sporting powder	590
Schultze powder	570

* Approximate volume (in cm ^{3}) of total gases evolved from 1 gm explosive

exponential A function expressed by the base of the Naperian system of logarithms e, raised to the power indicated by the variable, x Thus e^x is the exponential of x

$$e = 1 + \frac{1}{\lfloor 1} + \frac{1}{\lfloor 2} + \frac{1}{\lfloor 3} + \frac{1}{\lfloor 4} \text{ m n } = 2\,718281828$$

$$e^x = 1 + x + \frac{x^2}{\lfloor 2} + \frac{x^3}{\lfloor 3} + \frac{x^4}{\lfloor 4} \text{ m n}$$

The logarithm of e is 0 43429

exposure To open a sensitized plate to the action of light, *e g* , in taking a photograph **e meter** Photometer **e test** Aging test

expressed Squeezed out **e oil** A fatty oil (q v) as compared with essential oil (distilled)

expression (1) The squeezing out of a liquid, *e g* , plant juices oils, etc (2) A mathematical symbol or equation

extinction Fading-out Cf *optical density* **e coefficient** E The quantity $1/cy$ (log I_0/I) where I_0 and I are the intensities of light, respectively *falling on* and *transmitted* by a solution y cm thick and of molar concentration c Characteristic curves are obtained when E is plotted against the wave-length of light used (Cf *Lambert's* law)

Exton reagent A reagent for albumin consisting of a solution of 200 gm $Na_2SO_4\,10H_2O$ and 50 gm sulfosalicylic acid in 1 l water

extract A pharmaceutical preparation made from vegetable tissues either by expression maceration, digestion, or infusion with a solvent **acet-** Acetic acid extracts prepared by macerating the drug with acetic acid solution **alcoholic-** An extract prepared by exhausting the drug with concentrated or dilute alcohol **aqueous-** An extract prepared by infusing or percolating the powdered drug with water **dry-** Powdered- **fluid-** An extract of such strength that 1 cc represents 1 gm of the active principles of the drug **nitrogen-free-** The difference between the weight of a vegetable material and the combined weights of its moisture, ash, fat, protein and crude fiber It represents the non-protein, nonfatty material soluble in water, or brought into solution by

boiling successively with dilute (1 25 %) sulphuric acid and caustic soda Sugars and starches are the main constitutents of the nitrogen-free extract Hence, in reports of analyses, the term *carbohydrates* is sometimes substituted for *nitrogen-free extract* **powdered-** An evaporated and powdered extract **solid-** A thick, semi-solid extract

extraction The process of separating the active constituents of drugs by suitable methods The solvent may be

1 Water—see *infusions, decoctions*
2 Alcohol—see *fluid extracts, and tinctures*
3 Wine—see *wines*
4 Dilute acetic acid—see *vinegars*
5 Ether—see *ethereal extracts, oleoresins*

e apparatus Apparatus used for the extraction of fats, oils, or waxes from substances, preparatory to or as part of their analysis See *Soxhlet, Bailey-Walker* **e flasks** Small round flasks of high-resistance glass **e thimble** A cup made of some fat-free porous material (filter paper, alundum) in which the substance to be extracted is placed **e tube** A specially designed tube holding e thimbles, which enables the solution to flow downward into the container, and the vapors to pass above the thimbles into the condenser *E g , Soxhlet tube*

extractive Undetermined substance(s) extracted with a certain solvent in chemical analysis, *e g* , ether-extractives, alcohol-extractives, etc

extracts A dried plant juice The following extracts and inspissated juices are official (U S P)

Aloes	Guarana
Catechu	Glycyrrhiza
India-rubber	Lactucarium
Kino	Opium

extrusion Forcing a substance through an aperture or die

exudate A material that has filtered through the walls of living cells and accumulates in the adjacent tissues **vegetable-** A Soluble in water, insoluble in alcohol—GUMS, B Soluble in alcohol and insoluble in water—RESINS

exude Oozing out, either under heat or pressure, of a softer or more fusible substance from a harder or less fusible material

eyebright The herb of *Euphrasia officinalis*, a Scrophulariaceae, used for eye lotions

F

F (1) The symbol for fluorine (2) Abbreviation for magnetomotive force, (3) faraday, (4) Fahrenheit, (5) degree of freedom, (6) free energy, (7) force

F acid (1) 2 7-Naphthylaminesulfonic acid (2) 7-Amino-2-naphthalene-sulfonic acid (3) β-Naphthol-8-sulfonic acid

F 12 Freon

f An abbreviation for (1) farad (not *faraday*), (2) force, (3) function, (4) acceleration

f Function, thus $x = f(t)$, x is a function of t

φ, ϕ, Φ The Greek letter phi (1) An abbreviation for phenyl (2) A symbol for fluidity

faba Latin for bean **f physostigma** See *physostigma*

fabiana The dried leaves of *F imbricata*, a Solanaceae of South America **f resin** $(C_{18}H_{30}O_2)_8$ F tannoid A crystalline resin from f Cf *crocin, pichi*

fabianol $C_{54}H_{90}O_2$ = 771 0 A volatile oily liquid from *Fabiana imbricata*

face-centered cube A unit of crystal structure, (q v) consisting of a space lattice (q v) in which a fifth atom is located centrally to the four corners of a plane

facing The addition of a coloring matter to food to improve its appearance, as, tea, flour, rice

fact Anything that has real existence Known to be true A result established by repeated experiment Opposed to fancy or conjecture

factice A white light, and fluffy rubber substitute, obtained by the vulcanization of linseed oil

factitious Made artificially

factor (1) A reacting substance, (reactant) which takes part in a chemical change (2) When two quantities are multiplied together, each is known as a factor of the multiplication (3) Vitamin, q v **accessory food-** Vitamin **analytic-** Gravimetric- or volumetric- **conversion-** See *conversion* **gravimetric-** A quantity which, multiplied by the weight of precipitate obtained in gravimetric analysis gives the amount of the related substance being determined **volumetric-** A quantity which, multiplied by the number of cubic centimeters of a standard solution, gives the amount of the corresponding substance that is being determined in volumetric analysis **volumetric correction-** A quantity (determined by experiment) which, multiplied by the number of cubic centimeters of a volumetric solution, gives the number of cubic centimeters of a normal solution *E g* , volumetric solutions which deteriorate or which are difficult to standardize may be used for titrations, provided their correcting factor is known

f quantity A factor used as an aid to rapid calculation in quantitative analysis *E g* , in the determination of carbon in steel by weighing it as CO_2, the f quantity is 2 73, thus if 2 73 gm of steel are taken for analysis the number of decigm of CO_2 found is numerically equal to the CO_2 present as %

facultative Permissive or optional **f aerobe** A bacterium which, while having preference for anaerobic conditions, can live in an atmosphere containing oxygen **f anaerobes** Bacteria which, while having preference for an oxygen atmosphere, can also live in absence of such atmosphere

fadeometer An instrument for comparison of the fading-properties of dyed fabrics etc which are exposed under standard conditions of humidity etc to a carbon arc (artificial sunlight)

fading The loss of color by a dye or dyed fabric etc on exposure to the sun and atmosphere, (antonym, *fastness*)

fæcal See *fecal*

fæces See *feces*

fagacid An acid resin from beech wood, soluble in alkalis, used as an antiseptic in soaps and plasters

fagine An alkaloid obtained from the fruit of the beech tree, *Fagus sylvatica*, a Cupuliferae

fahlerz Tetrahedrite

Fahr Abbreviation for Fahrenheit

Fahrenheit, Gabriel Daniel 1686–1736 A German physicist who devised meteorological instruments, thermometers, and hygrometers **F scale** A thermometer scale invented by F and based upon the lowest temperature which he could obtain by freezing mixtures Water freezes at 32°F, and boils at 212°F Hence 1°C = 1 8°F, and absolute zero −273°C = −459 4°F See *thermometer scales*

faience Glazed pottery

Fairbanks cement testing machine A lever device resembling a balance, and having a stress capacity of 1000 pounds, used for testing the tensile strength of cement blocks

Fajans, Kasimir 1887– A German physicist noted for his work on radioactive substances and the discovery of brevium **F -Soddy law** When an α-particle is expelled from a radioactive substance the product is two places lower in the periodic table A β-ray change, or expulsion of an electron, produces a rise of one place

false hellebore Adonis

false unicorn Aletris **f u root** See *chamaelirin, helonias*

Fament's process The removal of P and S from iron by treatment with a current of hydrogen in heated retorts

family (1) A group, or a part of a period of elements that have similar properties, *e g* , the first *group* Li, Na, K, Rb, Cs is the alkali family, while the *period* Cr, Mn, Fe, Co, Ni is the iron family See *periodic system* (2) Order A biological division higher than genus

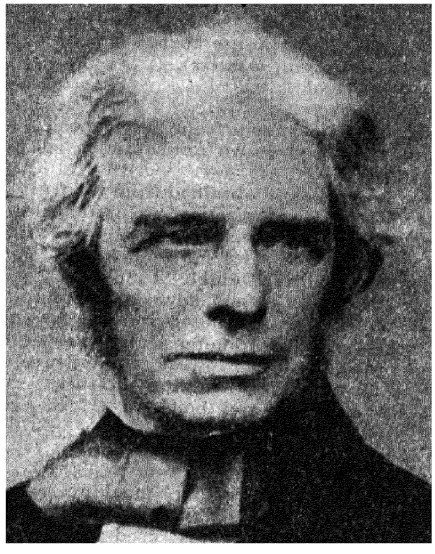
fanghi di sclefani A light-yellow, fine powder of volcanic origin, mainly sulfur with small amounts of manganese, iron, and calcium

faolite A material made from phenolformaldehyde resin and asbestos

farad f A unit of electrical capacity, the capacity of a condenser charged to a potential

of one volt by one coulomb of electricity. Cf. *faraday*. It is 10^{-9} C.G.S. unit. **micro-** The one-millionth part of a farad = 10^{-6} farad; the practical unit.

Faraday, Michael. 1791–1867. An English chemist and physicist noted as a famous experimentalist in the liquefaction of gases, the effect of an electric current on the magnetic needle, electrolysis, and as discoverer of benzene. **F. effect.** A beam of polarized light when passed through a magnetic field is rotated in the direction of the lines of magnetic force. **F. laws.** (1) The weight of an ion deposited electrolytically is proportional to the strength of the current passing through the solution. (2) 96,489 coulombs (1 faraday) liberate 1 gram equivalent of any ion during electrolysis. (See *electrochemical equivalent*.) **F. law demonstration apparatus.** A device for illustrating



Michael Faraday.

Faraday's law by simultaneously electrolysing various solutions and weighing the amounts deposited with a set of balances of the specific gravity type. **F. tube.** Ammonia tube. A V-shaped tube of hard glass, which, inverted, is used for distillation, purification and crystallizing of liquids under pressure; as, liquid ammonia, by placing each arm alternately in ice water and warm water. **F. unit.** See *farad, faraday*. **F. washing bottle.** *Washing bottle.*

faraday. F. The quantity of electricity which liberates one gram equivalent of a metal in electrolysis. 1 Faraday = 96,489 coulombs = 9648.9 ± 0.7 e.m.u. = (2.89270 ± 0.00021) × 10^{14} e.s.u. = 6.06 × 10^{23} electrons per mole. Cf. *farad*. Cf. *Avogadro, einstein, Faraday's law*.

faradiol. $C_{30}H_{50}O_2$ = 442.39. A diatomic alcohol from colt's foot, *Tussilago farfara*, a Compositae.

faradization. The use of induced high-voltage currents for therapeutic purposes.

farina. (1) Flour or a fine meal. (2) A starch, usually from potato.

farinaceous. Containing or consisting of flour.

farinose. The cellulose of starch; *e.g.*, the substance of which the cell walls of starch granules are composed.

farnesal. $C_{15}H_{24}O$ = 220.2. The aldehyde of farnesol.

farnesene. $C_{15}H_{24}$ = 204.2. *3.7.11*-Trimethyl-*2.6.10*-dodecatetrene. A sesquiterpene from citronella oil.

farnesol. $C_{15}H_{26}O$ = 222.2. The alcohol CMe_2:-$CH(CH_2)_2CMe$:$CH(CH_2)_2$.CMe:$CH.CH_2OH$ an isomer of nerolidol, d.0.895, $b._{0.2mm}120$. It is obtained from the flowers of *Acacia farnesiana*, from oil of cassia, ambrette seed oil, etc. and has a fine floral odor; used in perfumery.

Farrar's process. Pig iron is treated with ammonium chloride, potassium ferrocyanide and manganese dioxide.

fast red. Azo-β-naphthol-α-naphthyl-aminosulfonic acid. A red dye used as an indicator from pH 10.5 – 12.1.

fastness. The extent to which a dye or dyed fabric etc. resists loss or change of color on exposure to the sun and atmosphere, (antonym, *fadeability*).

fat. (1) A solid or liquid oil consisting of the glyceryl esters of the higher fatty acids; *e.g.*, tristearin, tripalmitin, and triolein. See *fats*. (2) Abounding, rich. Cf. *lean*. **animal-** A fat derived from an animal source. **mineral-** See *mineral oil*. **vegetable-** A fat derived from a vegetable source.

f. asphalt. An asphalt low in gravel and sand. **f. clay.** A clay of good plasticity. **f. coal.** Coal rich in volatile matter. **f. ore.** A high-grade ore. **f. sand.** A sand for molding. containing a large amount of clay and alumina. **f. soluble.** A substance soluble in oils; as, fat-soluble A (see *vitamin A*).

fatal. Causing death. **f. dose.** The quantity of a drug that causes death.

fatigue. The localized deformation of metals produced by repeated stresses.

fats. (1) Greasy or oily substances. (2) Fixed oils, fatty oils, expressed oils. The glyceryl ester of a fatty acid, or a mixture of fatty acids. They are generally odorless, colorless and tasteless in the pure state, but they may be flavored by various ingredients, according to the source. Fats are insoluble in water, soluble in ether, chloroform or benzene. They occur in every animal and vegetable tissue and are generally obtained by heating or boiling bones, fishes, or other animal matter, or by extracting seeds under pressure. Classification:

(a) Source:	Liquid fats.
Animal fats.	1. drying oils
Vegetable fats.	2. non-drying oils
(b) Properties:	3. fish oils
Solid fats.	4. fluid waxes.

Their principal chemical values are:—Saponification value, (q.v.); iodine number, (q.v.); acid number, (q.v.); acetyl number, (q.v.). Cf. *oils, waxes, linin, sterols*.

fatsin. $C_{31}H_{58}O_{20}$ = 745.4. A glucoside from *Fatsia japonica*, an Araliaceae of Japan.

fatty acid. (1) A group of organic, monobasic acids derived from the hydrocarbons by the equivalent of an oxidation of a methyl group:

$$R—CH_3 \rightarrow R.CH_2OH \rightarrow R.CHO \rightarrow R.COOH$$

(hydrocarbon, alcohol, aldehyde, acid). (2) The three acids occurring most frequently in fats as glyceryl esters; palmitic, stearic and oleic acid.

The fatty acid series are

A	Saturated	$C_nH_{2n+1}COOH$ or $C_nH_{2n}O_2$
	formic acid	HCOOH
	acetic acid	MeCOOH or CH_3COOH
	propionic acid	EtCOOH or C_2H_5COOH
	butyric acid	PrCOOH or C_3H_7COOH
	valeric acid	BuCOOH or C_4H_9COOH
	caproic acid	$C_5H_{11}COOH$
	enanthylic acid	$C_6H_{13}COOH$
	caprylic acid	$C_7H_{15}COOH$
	pelargonic acid	$C_8H_{17}COOH$
	capric acid	$C_9H_{19}COOH$
	undecylic acid	$C_{10}H_{21}COOH$
	lauric acid	$C_{11}H_{23}COOH$
	tridecoic acid	$C_{12}H_{25}COOH$
	myristic acid	$C_{13}H_{27}COOH$
	pentadecanoic acid	$C_{14}H_{29}COOH$
	palmitic acid	$C_{15}H_{31}COOH$
	margaric acid	$C_{16}H_{33}COOH$
	stearic acid	$C_{17}H_{35}COOH$
	nondecylic acid	$C_{18}H_{37}COOH$
	arachidic acid	$C_{19}H_{39}COOH$
	behenic acid	$C_{21}H_{43}COOH$
	carnaubic acid	$C_{23}H_{47}COOH$
	hyenic acid	$C_{24}H_{49}COOH$
	carboceric acid	$C_{25}H_{51}COOH$
	cerotic acid	$C_{26}H_{53}COOH$
	lacceroic acid	$C_{31}H_{63}COOH$
	melissic acid	$C_{29}H_{59}COOH$
	montanic acid	$C_{28}H_{55}COOH$
	psyllic acid	$C_{32}H_{65}COOH$
B	Unsaturated	$C_nH_{2n-1}COOH$ or $C_nH_{2n-2}O_2$
	See *acrylic acids*	
C	Unsaturated	$C_nH_{2n-3}COOH$ or $C_nH_{2n-4}O_2$
	See *acetylene acids* Also	
	sorbic acid	C_5H_7COOH
	linoleic acid	$C_{17}H_{31}COOH$
D	Unsaturated	$C_nH_{2n-5}COOH$ or $C_nH_{2n-6}O$
	linolinic acid	$C_{17}H_{29}COOH$

fatty compounds Aliphatic compounds **fatty series** The compounds of the aliphatic series or methane series (q v)

fault finder An electrical resistance instrument for measuring the resistance of conductors, used to locate breaks or faults in a cable or electrical wire

fauna The animals of a given region or country, either geographical, topographical, or geological Cf *flora*

fayalite (1) Fe_2SiO_4 A ferrous orthosilicate, of the olivine group from Fayal (Madeira) (2) Fe_2SiO_4 A constituent of iron slags from copper smelters

Fe The symbol for iron (ferrum)

feather ore Jamesonite

febrifacient A drug or agent that produces fever

febrifuge A drug which reduces or prevents fever, *e g* , an antipyretic

fecal, fæcal Obnoxious, foul **f odor** A rank odor, *e g* , of skatole or naphthylamine

feces, fæces The excrements or alimentary refuse Examination

1 Macroscopic color, character, consistency, blood-streaks, mucus, parasites, apparent digestion

2 Microscopic Protozoa, vegetable cells, red blood cells, epithelial cells, pus cells, fat cells, starch cells, muscle fibre, food particles

3 Chemical Occult blood by benzidine or guaiacol test, sublimate test, fermentation tests, nitrogen, mineral matter

4 Bacteriological Gram's stain, etc

Fehling, Herman von 1812–1885 A German chemist, noted as an investigator of organic compounds, and of analytical methods **F solution** A solution for the detection or determination of reducing sugars, it consists of solution A (34 639 gm copper sulfate in 500 cc water), and solution B (173 gm sodium-potassium tartrate, 60 gm sodium hydroxide in 500 cc water) mixed in equal parts before using For volumetric determination, the solution is standardized against a solution of dextrose of known strength Cf *Benedict's, Pavy's solution*

Feic Abbreviation for the ferricyanide ion $Fe(CN)_6^{---}$

feints The impure portion of the second distillate of fermentation alcohol

feldspar Felspar (1) A group of igneous crystalline rock minerals which are chiefly silicates of alumina with soda potash or lime (2) The mineral $K_2O,Al_2O_3\,6SiO_2$

felite A form of belite

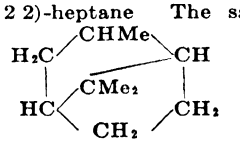
fellanic acid $C_{50}H_{72}O_6$ = 768 7 An acid derived from bile

felspar Feldspar

femic Containing iron and magnesium **f minerals** Igneous rocks richer in iron than in aluminum Cf *alferric*

-fen, -phen A suffix which indicates a sulfur-containing hydrocarbon

fenchane $C_{10}H_{18}$ = 138 2 2 7 7-trimethylbicyclo-(1 2 2)-heptane The saturated hydrocarbon

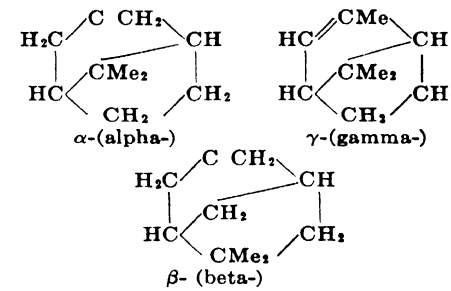


An isomer of camphane, pinane, and carane Cf *terpenes*

fenchanol Fenchyl alcohol

fenchanone Fenchone

fenchene $C_{10}H_{16}$ = 136 2 *7 7*-Dimethyl-*2*-methylenenorcamphane A terpene and constituent of essential oils, isomers



α-(alpha-) γ-(gamma-)

β- (beta-)

A colorless liquid, soluble in alcohol or ether *α-* d 0 866, b 155 *β-* d 0 860, b 152 *γ-* d 0 854, b 146

fenchol Fenchyl alcohol

fencholic acid $C_{10}H_{16}O_2$ = 170 5 A colorless crystalline substance, m 19, b_{17mm} 152, soluble in alcohol

fenchone $C_{10}H_{16}O$ = 152 1 Fenchanone, oxyfenchane, *1 3 3*-trimethyl-*2*-norcamphanone A ketone in essential oils A colorless liquid, d 0 9465, m 5, b 192, insoluble in water, miscible with alcohol or benzene Cf *pinone*

fenchoxime $C_{10}H_{17}ON$ = 167 2 A colorless crystalline substance, m 161, b 240, insoluble in water, soluble in alcohol or ether

fenchyl The monovalent radical, $C_{10}H_{17}$—, derived from fenchane **f alcohol** $C_{10}H_{18}O$ =

154 3 Fenchol, 1-hydroxy-fenchane, 2-fenchanol A colorless crystalline substance m 38 5, b 201 4, in some essential oils, (pine oil, turpentine)

fenchyval The isovaleric ester of fennel oil, used medicinally in hysteria

fennel Foeniculum The dried, ripe fruit of *Foeniculum vulgare* an Umbelliferae Used medicinally as an aromatic, and carminative, as a flavoring agent, and as spice **f oil** Oleum foeniculi The essential oil from the fruits of *Foeniculum vulgare* an Umbelliferae A colorless, strongly aromatic, liquid, d 0 965–0 075 containing chiefly pinene, phellandrene, limonene dipentene, fenchone, and anethole Used medicinally as a carminative and antispasmodic, and technically in flavoring extracts Cf *ferulene* **water-** The oil, d 0 85–0 89, from *Oenanthe aquatica*

Fenton's reagent Hydrogen peroxide containing some Fe^{++}, it is used for oxidizing sugars and alcohols

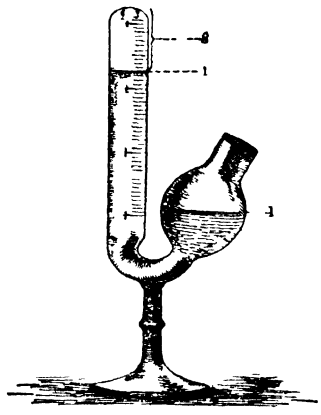
fenugreek The seeds of *Trigonella foenum graecum*, a Leguminosae of Morocco and India, used as a condiment and emollient, and externally in poultices

Feoc Abbreviation for the ferrocyanide ion, $Fe(CN)_6^{----}$

ferberite $FeWO_4$ A dark metallic, iron tungstate containing less than 20 % of manganese tungstate (cf *hubnerite*)

fergusonite $Y(Cb,Ta)O_4$ A dark-brown or metallic lustrous yttrium columbate and tantalate d 5 8–5 9 hardness 5 5–6

ferment (1) A substance which causes chemical changes, especially fermentation, without yielding any of its own matter to the products of fermentation See *catalyst, enzymes* The terms, ferment and enzyme, are used interchangeably, but it is the custom to apply "ferment" to a catalytic agent produced by organisms and still associated with the living organism, and "enzyme" to a catalyst which may be separated from the living organism Hence *ferments* or organized catalyzers are those substances not removable from the cell, while *enzymes* or unorganized catalyzers are removable and exist in filtered solutions **active-** A ferment produced from a zymogen with or without the aid of an activator **co-** Coferment **organized-** A ferment **pro-** *Zymogen* **unorganized-** An enzyme (2) Undergoing fermentation, q v



Fermentation tube

1 Fermenting liquid
g Gas formed during fermentation

fermentation (1) A chemical change of organic matter brought about by the action of an enzyme or ferment The changes tend towards a chemical simplification of the existing compounds (2) The boiling stage in the puddling process **acetic-** The production of vinegar from alcoholic liquids by f **alcoholic-** The change from sugar to alcohol and carbon dioxide by the ferment of the yeast cells **amylolytic-** The hydrolysis of starch to dextrins by the action of saliva **butyric-** The formation of butyric acid **lactic-** The souring of milk, *e g*, the formation of lactic acid from sugars **panary-** The f processes associated with the manufacture of bread **vinous-** The production of wine by fermentation

f alcohol Ethanol made by fermentation **f chemistry** Zymurgy **f processes** The utilization of f for industrial purposes, *e g*, to produce

acids	acetic butyric, citric, oxalic, gluconic, lactic, gallic acid
alcohols	ethanol, butanol, pentanol
carbohydrates	cellulose hemp, burlap, ensilage, indigo
fats	vegetable oils
fuel gas	methane from sewage and cellulose
foods	pickles, vinegar, cheese, bread, sauerkraut, olives
luxuries	tobacco, beer, wine, coffee, tea
proteins	gelatin, glue, leather

f tube A bent glass tube used in tests for fermentation to collect the gases evolved (see figure)

Fermi, Enrico 1902– An Italian-born physicist noted for his synthesis of trans-uranium, element 93, by bombarding uranium with neutrons Cf *ausonium ekaosmium*

fern See *Filices*

ferrate (1) A salt of the unknown acidic oxide FeO_3, (ferric acid) containing the divalent $=FeO_4$ radical, as in Na_2FeO_4— sodium ferrate The solutions are deep red in color and unstable (2) Erroneously applied to ferrite, q v

ferratogen Ferric nucleinate

ferri- A prefix indicating the presence of a ferric ion, Fe^{+++}, in a compound

ferriammonium- A prefix indicating the presence of both, the trivalent iron, Fe^{+++} and ammonium, NH_4^+, in a compound **f chromate** $(NH_4)Fe(CrO_4)_2 = 305\ 0$ A brownish, crystalline crust, soluble in water **f chloride** $(NH_4)FeCl_4 = 215\ 6$ Ammoniated iron, ammonio chloride of iron, ammonium ferratum chloratum, flores martialis, aes martis Reddish-orange, crystalline grains of styptic taste Soluble in water, used medicinally in epilepsy and scrofula **f citrate** $Fe(NH_4)_3(C_6H_5O_7)_2 = 488\ 2$ Ferric ammonium citrate Iron and ammonium citrate Brown scales soluble in water, used medicinally in anemia, and contains 21–22 5 % iron (*green-*) Ferric ammonium citrate green, green iron and ammonium citrate Green scales, soluble in water, used in hypodermic medication and contains 14–15 % iron Light changes it to the brown form **f oxalate** $(NH_4)_3Fe(C_2O_4)_3\,3H_2O = 427\ 8$ Green crystals, soluble in water Used in photography and in the preparation of sensitive paper (blue-print paper) **f sulfate** (NH_4)-$Fe(SO_4)_2\,12H_2O = 482\ 01$ Iron and ammonium sulfate, iron and ammonium alum, ammonio-ferric sulfate, ammonium ferric alum Pale violet, octahedral crystals, soluble in

water Used as a styptic and astringent, technically in the dye-industry, chemically as reagent and indicator in volumetric analysis **f tartrate** $NH_4Fe(C_4H_4O_6)_2$ Iron and ammonium tartrate Brown crystals, soluble in water Used medicinally as a styptic

ferric Ironic A compound of trivalent iron, Fe≡ or Fe^{+++}, usually more stable than the corresponding ferrous salt, and has a yellowish, brownish, or reddish color **f acetate** $Fe_2(C_2H_3O_2)_3$ = 288 8 Brownish-red scales soluble in water Used as a tonic, and technically as a mordant in the dye-industry (*basic-*) $Fe(OH)(C_2H_3O_2)_2$ = 190 9 Ironic acetate A red, amorphous powder, sparingly soluble in water, used in the dye industry **f albuminate** A cinnamon brown powder, soluble in water, used medicinally as a tonic and for beri-beri **f alginate** $Fe_3C_{76}H_{77}O_{22}N_2$ A brown, tasteless powder, insoluble in water, soluble in ammonia, used as a hematinic **f ammonium** Ferriammonium **f arsenate** $FeAsO_4\ 2H_2O$ = 230 9 A brown powder insoluble in water or alcohol, soluble in dilute acids The iron arsenate of commerce is ferrous arsenate **f arsenite** $4Fe_2O_3\ As_2O_3\ 5H_2O$ = 926 72 A brown powder **f benzoate** $Fe_2(PhCOO)_2$ = 353 78 A brown powder, slowly soluble in oils, used to make oily, iron preparations, *e g*, ferrated codliver oil **f bromide** $FeBr_3$ = 295 6 Ironic bromide Dark-red crystals, d 3 18, decomp on heating, soluble in water, alcohol, or ether **f cacodylate** $Fe(Me_2AsO_2)_3$ = 467 2 Iron cacodylate A yellowish or brownish, odorless, powder, slowly soluble in water Used medicinally in hypodermic medication (ampoules) for anemia, chlorosis, tuberculosis, syphilis It contains 39 7–44 9 % arsenic **f camphorate** Iron camphorate A yellowish-red, bulky powder, insoluble in water, soluble in alcohol, used medicinally for chlorosis **f carbonate** A mixture containing varying amounts of $Fe_2(CO_3)_3$ $Fe(OH)_3$ and $Fe(OH)_2$ A reddish-brown powder, insoluble in water, soluble in acids Used medicinally as a hematinic (*saccharated-*) See *ferrous carbonate* **f chloride** $FeCl_3$ = 162 2 Ironic chloride, iron-3-chloride Brown or black, hexagonal, iridescent crystals, d 2 52 m 298, soluble in water, alcohol, or ether (*hydrous*) $FeCl_3\ xH_2O$ A yellow or orange colored crystalline mass, containing 12, 6, or 5 molecules of crystal water readily soluble in water, alcohol, or ether Used technically in the dye industry, medicinally as a styptic (containing not less than 20 % Fe) **f chromate** $Fe_2(CrO_4)_3 \cdot xH_2O$ A dark-brown solution of ferric chromate, miscible with water, used as mordant in the dye industry (*acid*) $Fe_2(Cr_2O_7)_3$ = 759 7 Ferric bichromate, acid iron chromate A reddish-brown, granular powder, soluble in water, used technically in pigments, mixed with glue, gum, oil, or waterglass **f citrate** $FeC_6H_5O_7\ 3H_2O$ Iron citrate, ferri citras Transparent red scales, slowly soluble in water, used medicinally as a hematinic (*green*) Ferriammonium citrate **f ferricyanide** $Fe[Fe(CN)_6]$ = 267 7 Ironic ferricyanide A red substance, soluble in water **f ferrocyanide** $Fe_4[Fe(CN)_6]_3$ = 859 1 Ironic ferrocyanide, insoluble Prussian blue (q v), Turnbull's blue Dark-blue crystals, insoluble in water, alcohol, or ether, soluble in concentrated acids and oxalic acid Used as a tonic and antiperiodic, technically as a pigment (Prussian blue, Berlin blue, Paris blue), and in blue inks (with oxalic acid) *α-* or *soluble-* Potassium ferric ferricyanide **f fluosilicate** $Fe_2(SiF_6)_3$ = 537 86 A flesh-colored gel, soluble in water **f formate** $Fe(HCOO)_3$ = 190 9 A red, crystalline powder, soluble in water or alcohol **f glycerophosphate** $Fe_2[C_3H_5(PO_4)(OH)_2]_3$ = 616 2 Iron glycerophosphate Yellow scales, soluble in water or alcohol Used medicinally as a tonic in anemia chlorosis, malaria, etc **f hydroxide** $Fe(OH)_3$ = 106 9 Ironic hydroxide A reddish-brown, amorphous powder, d 3 4–3 9 insoluble in water or alcohol, soluble in acids Used as a hematinic and antidote for arsenic compounds, technically, in the rubber industry **f hypophosphite** $Fe(H_2PO_2)_3$ = 250 9 Dihydric ferric hypophosphite A white or gray powder sparingly soluble in water, soluble in conc alkali citrate solution, used as a tonic **f iodate** $Fe(IO_3)_3$ A brownish-powder, usually containing some Fe_2O_3 readily decomp when heated, used medicinally as an alterant **f iodide** FeI_3 = 436 8 Black, shining crystals, soluble in water **f lactate** $Fe(C_3H_5O_3)_3$ = 322 9 A brownish-red powder, used medicinally as a tonic **f malate** $Fe_2(C_4H_4O_5)_3$ = 507 7 A red powder, or brown deliquescent scales, soluble in water, alcohol, or ether, used medicinally as a tonic and alterant **f nitrate** $Fe(NO_3)_3\ 9H_2O$ = 404 0 Ironic nitrate Colorless, rhombic crystals, d 1 683, m 47, soluble in alcohol, ether, or water (*solution*) An aqueous solution containing 33 % ferric nitrate or 7 5 % iron A dark-red liquid, d 1 25 used technically in the dye industry for calico printing, in the tanning industry, and in the manufacture of iron pigments **f nucleinate** Ferratogen, ferrinol A grayish-white or yellowish powder obtained from yeast grown in ferruginous media, soluble in water, used medicinally as a tonic **f oleate** $Fe(C_{18}H_{33}O_2)_3$ = 899 9 A deep-red, soft, mass, used in paints **f oxalate** $Fe_2(COO)_3$ = 375 7 Ironic oxalate Yellow scales or amorphous powder, decomp at 100, soluble in water, insoluble in alcohol **f oxide** Fe_2O_3 = 159 7 Ironic oxide, red iron oxide, Pompey red, iron sesquioxide An oxide of iron occurring in nature as red hematite or martite as red, hexagonal or rhombic crystals, or a brown powder, d 5 12–5 30, m 1541 Insoluble in water, or alcohol, soluble in acids Used as a pigment and abrasive for polishing glass, porcelain, and metals (*magnetic-*) Ferriferrous oxide **f peptonate** A yellowish-brown amorphous powder, or reddish, deliquescent scales, containing 5 % or 25 % ferric oxide, soluble in water Used medicinally as a non-astringent hematinic **f perchlorate** $Fe(ClO_4)_3$ = 354 2 Brown crystals soluble in water **f perchloride** Ferriferrous chloride **f persulfate** Ferriferrous sulfate **f phenate** A group of compounds of ferric iron and phenol of variable composition They form purple, deliquescent masses, soluble in water **f phosphate** $FePO_4\ 2H_2O$ = 186 91 Ironic phosphate Yellow, rhombic or monoclinic crystals, d 2 87, insoluble in water, soluble in acids, used in dentistry (*green-*) Ferriammonium phosphate **f potassium ferrocyanide** Potassium f ferrocyanide **f pyrophosphate** $Fe_4(P_2O_7)_3$ = 745 5 A white powder, insoluble in water, soluble

in carbonated water, used medicinally as a tonic (*green-*) A group of compounds of ferric pyrophosphate with ammonium citrate, sodium citrate, magnesium citrate, or potassium citrate, used in hypodermic medication **f pyrosulfate** FeS_2O_7 = 231 9 A white, microcrystalline powder **f pyrothioarsenate** $Fe_4(As_2S_7)_3$ = 1345 3 A grayish brown powder **f rhodanate** F thiocyanate **f stearate** $Fe[C_{18}H_{35}O_2]_3$ = 906 0 A light-brown powder, insoluble in water **f subcarbonate** Sesquioxide of iron, saffron of mars, red oxide of iron, hydras ferricus, crocus martis A hydrous precipitate from iron solutions, consisting of variable mixtures of ferric oxide and ferric hydroxide, used medicinally as a tonic **f subsulfate** $Fe_4O(SO_4)_5$ or $Fe_2(SO_4)_3 \cdot Fe_2(SO_4)\ O$ = 719 49 Monsel's salt Reddish brown transparent scales, very soluble in water, used medicinally as a styptic **f succinate** $FeC_4H_4O_4(OH)$ An amorphous reddish-brown powder, nearly insoluble in water, used as a tonic **f sulfate** $Fe_2(SO_4)_3 \cdot 9H_2O$ = 562 1 Yellow rhombic crystals, or a grayish white powder, d 2–2 1, soluble in water or alcohol **f sulfide** Fe_2S_3 = 207 9 Yellowish green crystals, d 4 25–4 41, decomp on heating or with solvents **f sulfocyanate** F thiocyanate **f tannate** $Fe_2(OH)_3C_{14}H_7O_9$ = 481 78 A dark brown powder, insoluble in water, used medicinally **f tartrate** $Fe_2(C_4H_4O_6)_3 \cdot H_2O$ = 573 9 Brown scales, soluble in water, used medicinally as an emmenagogue and tonic **f thiocyanate** $Fe(CNS)_3 \cdot 3H_2O$ = 284 1 Ironic sulfocyanide, f rhodanate, f thiocyanide Dark red crystals or a brown granular powder, soluble in water, alcohol or ether **f valerianate** $Fe(OH)_2C_5H_9O_2$ = 190 9 A brown, amorphous powder, insoluble in water, soluble in acids, used as a tonic and emmenagogue **f vanadate** $Fe(VO_3)_3$ = 352 8 Ironic metavanadate A dark grayish-brown powder, insoluble in water

ferricyanic acid The hypothetical acid, $H_3Fe(CN)_6$, from which the ferricyanides are derived

ferricyanide A salt of ferricyanic acid containing the trivalent $Fe(CN)_6\equiv$ radical **ferric-** Ferric ferricyanide **ferrous-** Ferrous ferricyanide Cf *nitroprusside*

ferriferous (1) Containing iron in the ferric state (2) Yielding or bearing iron

ferriferrous Describing a compound containing both, divalent and trivalent iron, Fe= and Fe≡, synonym ferrosoferric **f chloride** Fe_7Cl_8 or $FeCl_2 \cdot 2FeCl_3$ = 451 2 Ferrosoferric chloride Yellow, deliquescent crystals, soluble in water **f cyanide** (1) Ferric ferrocyanide (2) Ferrous ferricyanide **f hydroxide** $Fe_3(OH)_8$ = 303 61 A black powder, soluble in hydrochloric acid **f oxide** Fe_3O_4 or $FeO \cdot Fe_2O_3$ or $Fe(FeO_2)_2$ = 231 5 Ferrosoferric oxide, magnetic iron oxide, martial ethiops, black iron oxide A black, regular crystalline powder, d 5 16, m 1537, insoluble in water, alcohol or alkalis, soluble in acids **f sulfate** $Fe_3(SO_4)_4$ = 551 7 Ferrosoferric sulfate There are several basic and acid derivatives, some of which occur as minerals **f sulfide** Fe_3S_4 or $FeS \cdot Fe_2S_3$ = 295 7 Ferrosoferric sulfide A black powder, insoluble in water, decomp by acids

ferrimagnesium citrate $FeMg_3(C_6H_5O_7)_3 \cdot (H_2O)_8$ Iron and magnesium citrate, ironic magnesium citrate Reddish-brown scales, soluble in water, used medicinally as a hematinic and tonic

ferrimanganese An alloy of iron and manganese, used for the deoxidation and desulfurization of molten steel

ferrimanganic A compound containing both, trivalent iron, Fe≡, and manganese, Mn≡ **f citrate** $FeMn(C_6H_5O_7)_2$ Brown scales, slowly soluble in water used medicinally similarly to ferric citrate **f pyrophosphate** $Fe_2Mn_2(P_2O_7)_3 \cdot (H_2O)_x$ A yellow powder of variable composition, used medicinally as tonic **f tartrate** $FeMn(C_4H_4O_6)_3$ Brown scales, slowly soluble in water

ferrinol Ferric nucleinate

ferripotassium A double salt containing potassium and trivalent iron **f citrate** $FeK_3(C_6H_5O_7)_2 \cdot (H_2O)_x$ Iron and potassium citrate, ironic potassium citrate Transparent brown scales or leaflets, soluble in water, used medicinally as a tonic and hematinic **f cyanide** Potassium ferricyanide **f oxalate** $K_3Fe(COO)_3 \cdot 3H_2O$ = 359 3 Iron and potassium oxalate Smaragd-green crystals, soluble in water **f sulfate** Potassium ferric sulfate

ferripyrine $2FeCl_3 \cdot 3C_{11}H_{12}ON_2$ A compound containing 36 % ferric chloride and 64 % antipyrine A red crystalline powder, soluble in water or alcohol insoluble in ether, used medicinally as a styptic and hematinic

ferrisodium A double salt containing sodium and trivalent iron **f benzoate** A mixture of equal parts ferric benzoate and sodium benzoate **f citrate** $FeNa_3(C_6H_5O_7)_2(H_2O)_x$ Iron and sodium citrate, ironic sodium citrate Light brown leaflets, soluble in water, used medicinally as a tonic and astringent **f oxalate** $Na_3Fe(COO)_3 \cdot 4\frac{1}{2}H_2O$ = 338 0 Iron and sodium oxalate, ironic sodium oxalate, sodium ferric oxalate Green crystals soluble in water, used medicinally as a tonic, astringent and emmenagogue, and technically in photography **f pyrophosphate** $Na_3Fe(P_2O_7) \cdot 7H_2O$ = 599 1 Iron and sodium pyrophosphate A gray granular powder, slowly soluble in water, used medicinally as a tonic **f sulfate** $NaFe(SO_4)_2 \cdot 12H_2O$ Sodium iron alum, sodium ferric sulfate Octahedric, brown crystals, soluble in water

ferrite (1) An unstable compound of ferric oxide with a strong base, as $NaFeO_2$ or $Ca(FeO_2)_2$, which exists in strongly alkaline solutions of iron Cf *ferrate* (2) α-, β-, or γ- One of the allotropes of iron (q v)

ferro- A prefix indicating metallic iron (as in ferroaluminum) or divalent iron (as in ferrocyanide) **f prussiate** Potassium ferrocyanide

ferroaluminum An alloy of 80 parts iron and 20 parts aluminum, d 6 30, m 1480

ferroammonium Describing a compound containing divalent iron and ammonium **f bromide** $(NH_4)_2FeBr_4$ or $FeBr_2 \cdot 2NH_4Br$ = 411 8 Iron and ammonium bromide A brown powder, soluble in water **f chloride** Ferriammonium chloride **f cyanide** Ammonium ferrocyanide **f sulfate** $(NH_4)_2Fe(SO_4)_2 \cdot 6H_2O$ = 392 0 Iron and ammonium sulfate, ammonium ferrosulfate, ironous ammonium sulfate, Mohr's salt Green crystals, soluble in water, used in photography, and as a standard in volumetric analysis

ferrocarbon titanium. An alloy obtained by the reduction of titanium oxide with carbon in the

electric furnace, used for deoxidation of molten steel in steel manufacture

ferrocerium A pyrophoric alloy made by fusing cerium chloride and iron together, it is used as flint in automatic lighters

ferrochrome Ferrochromium

ferrochromium An alloy of 50 % iron and 50 % chromium, d 6 9, m 1458, used in the manufacture of steel

ferroconcrete Reinforced concrete

ferrocyanic acid The hypothetical acid, $H_4Fe(CN)_6$, from which the ferrocyanides are derived

ferrocyanide A compound containing the tetravalent $Fe(CN)_6\equiv$ radical **ferric-** Ferric ferrocyanide **ferrous-** See *ferrous ferrocyanide*

ferrodolomite The mineral $CaFe(CO_3)_2$

ferroferric Ferriferrous

ferroferricyanide Ferrous ferricyanide

ferroferrocyanide Ferrous ferrocyanide

ferromagnesium (1) An alloy of magnesium and iron (2) A compound containing both, divalent iron and magnesium **f lactate** Iron and magnesium lactate A yellow powder, soluble in water, used medicinally as a tonic **f sulfate** $MgFe(SO_4)_2\,6H_2O$ = 380 2 Iron and magnesium sulfate Green crystals, soluble in water, used medicinally as a tonic in anemia and chlorosis

ferromagnetism Magnetism due to the presence of magnetic iron and independent of an electric current

ferromanganese An alloy of 50 % iron and 50 % manganese, d 7 0, m 1325, used in the manufacture of tough steels

ferromanganic Describing a compound containing divalent iron and trivalent manganese

ferromanganous Describing a compound containing both, divalent iron and divalent manganese **f chloride** $MnFeCl_4$ = 252 6 Orange crystals, soluble in water **f iodide** $MnFeI_4$ = 618 2 A brown granular powder or prismatic crystals, soluble in water **f lactate** Iron and manganese lactate A white powder, soluble in water, used medicinally as a tonic **f sulfate** $MnFe(SO_4)_2\,12H_2O$ = 518 8 Iron and manganese sulfate A yellowish crystalline powder soluble in water, used medicinally as a tonic

ferromolybdenum A steel which contains about 2 per cent of molybdenum and does not soften on heating, used for high-speed lathe tools

ferron 7-Iodo-8-hydroxyquinoline-5-sulphonic acid, used as a reagent, *e g* , for fluorides

ferronickel An alloy of 74 2 % iron, 25 % nickel and 0 8 % carbon, d 8 1, m 1500, used in the manufacture of steel and tools, Cf *invar* **valve steel-** An alloy of 67 8 % iron, 32 % nickel, and 0 2 % carbon, d 8 0, m 1480

ferrophosphorus A by-product obtained by heating phosphate rock, silica and coke in an electric furnace or blast furnace Used in steel making to increase fluidity during casting

ferropotassium Describing a compound of divalent iron and potassium with another radical **f cyanide** Potassium ferrocyanide **f tartrate** A mixture of iron tartrates and potassium tartrates of variable composition, used for medicinal baths

ferropyrine Ferripyrine

ferrosilicon A hard steel alloy of 97 6 % iron, 2 % silicon, and 0 4 % carbon, 90 % of the steel manufactured is deoxidized with **f f zirconium** An alloy of iron, silicon and zirconium, used to purify molten steel and give it added resistance to shock

ferrosilite Clinoferrosilite Acicular crystals of $FeSiO_3$ in obsidian

ferrosoferric Ferriferrous **f oxide** Ferriferrous oxide

ferrosoferro- Ferrous ferro-

ferrotitanium An alloy of titanium and iron made by reducing titanium dioxide with powdered aluminum and iron, used for deoxidation of molten steel

ferrotungsten Tungsten steel An alloy of 94 5 % iron, 5 % tungsten and 0 5 % carbon used for tools **high speed-** High speed tool steel, an alloy of 75 % iron, 18 % tungsten, 6 % chromium, 0 3 % vanadium and 0 7 % carbon

ferrous- Ironous A prefix indicating compounds containing divalent iron, Fe= They are generally of a greenish color, give the ferrous ion, Fe^{++} in aqueous solution, and are good reducing agents **f acetate** $Fe(CH_3COO)_2$ = 114 0 Green crystals, used in solution as *iron liquor* (printer's liquor), and as a mordant **f ammonium** Ferroammonium **f arsenate** $Fe_3(AsO_4)_2\,6H_2O$ = 553 6 Ironous arsenate A green, amorphous powder, insoluble in water or alcohol soluble in ammonia or hydrochloric acid, used as an insecticide **f bromide** $FeBr_2\,6H_2O$ = 323 8 Ironous bromide A red, crystalline powder, soluble in water, alcohol or ether, used medicinally **f carbonate** $FeCO_3$ = 115 8 A grayish green rhombohedric crystalline powder, d 3 8, decomp by heat, insoluble in water, soluble in carbonated water and acids It oxidizes on exposure to air, used in the preparation of carbonated "ferruginous" waters **f chloride** $FeCl_2\,4H_2O$ = 198 8 Ironous chloride Green, monoclinic crystals d 1 926, soluble in water or alcohol Used as a reducing and adsorbing reagent, technically, in calico-printing and as a stain also in the extraction of copper from ores **f ferricyanide** $Fe_3[Fe(CN)_6]_2$ = 591 3 Ferroferricyanide A dark blue powder, insoluble in water, alcohol, or alkalis, soluble in dilute acids, decomp by heat, used as a pigment and dye **f ferrocyanide** $Fe_2[Fe(CN)_6]$ = 323 6 Ferrosoferrocyanide A white powder, insoluble in water **f fluoride** FeF_2 = 93 84 and $FeF_2\,8H_2O$ = 237 97 A white powder, sparingly soluble in water **f fluosilicate** $FeSiF_6\cdot 6H_2O$ = 305 99 Colorless crystals, d 1 961, soluble in water **f hydroxide** $Fe(OH)_2$ = 89 8 Ironous hydroxide A white amorphous powder which rapidly oxidizes and becomes successively greenish, yellowish and finally brown, insoluble in water or alcohol, soluble in acids or ammonia **f hypophosphite** $Fe(H_2PO_2)_2$ = 185 8 Dihydric ferrous hypophosphite A white powder which rapidly oxidizes to the ferric compound **f hyposulfite** FeS_2O_3 = 167 8 A white, amorphous powder, soluble in water, rapidly oxidizes **f iodide** $FeI_2\,4H_2O$ = 381 7 Ironous iodide Green, deliquescent, scales, d 2 873, anhydrous at 177, soluble in water, alcohol or ether, decomp on heating **f lactate** $Fe(C_3H_5O_3)_2\cdot 3H_2O$ = 287 8 Iron lactate Pale, greenish-white crusts of small needles or transparent green scales, with a slight peculiar odor, slowly soluble in water, and used medicinally **f nitrate** $Fe(NO_3)_2\,6H_2O$ = 288 0 Ironous

nitrate Colorless or pale-green crystals, m 60 5, very soluble in water **f oleate** A yellowish, soft soap **f oxide** FeO = 71 84 Ironous oxide, black iron oxide, iron monoxide A black powder, m 1419, insoluble in water, or alcohol, soluble in acids **f oxalate** $Fe(COO)_2$ = 143 8 A yellow, odorless powder sparingly soluble in water, soluble in acids **f perchlorate** $Fe(ClO_4)_2 6H_2O$ = 362 86 A soluble green powder **f phosphate** $Fe_3(PO_4)_2 8H_2O$ = 501 7 Colorless or bluish monoclinic crystals, d 2 58, insoluble in water or alcohol, soluble in acids Native as vivianite Cf *ludlamite* **f phosphide** FeP = 86 86 A black powder, d 5 2 In addition there are Fe_2P, Fe_2P_3, Fe_3P, Fe_3P_4 **f platinichloride** $FePtCl_6$ = 463 8 **f pyrothioarsenate** $Fe_2As_2S_7$ = 485 7 A grayish green powder **f structure** The crystal structure of cast iron **f sulfate** (1) *heptahydrate* or crystallized $FeSO_4 7H_2O$ = 278 0 Ironous sulfate, iron sulfate, green vitriol, green copperas Ferri sulphas Pale bluish-green, monoclinic crystals, d 1 875, m 64, decomp when further heated, soluble in water, insoluble in alcohol It occurs native as melanterite, used in large quantities for mordanting wool, as a disinfectant, and in the manufacture of ink and Prussian blue (2) *pentahydrate* $FeSO_4 5H_2O$ = 241 9 Pale green crystals, d 2 2, which occur native as siderotilate (3) *tetrahydrate* $FeSO_4 4H_2O$ = 223 9 (4) *monohydrate* $FeSO_4 H_2O$ = 169 9 A white powder, obtained by heating iron sulfate to about 140 It occurs native as szomolnokite (5) *anhydrous* $FeSO_4$ = 151 8 A white powder obtained by heating iron sulfate crystals to 300 **f sulfide** FeS = 87 9 Iron sulfide, ironous sulfide, pyrite A black, amorphous powder or crystalline masses, d 4 84, m 1197, insoluble in water, soluble in acids, used as a reagent for making hydrogen sulfide **f sulfite** $FeSO_3$ = 135 8 Colorless or greenish crystals, soluble in water **f sulfocyanide** F thiocyanate **f tantalate** See *tantalite* **f tartrate** $FeC_4H_4O_6$ = 203 9 A white crystalline powder, slightly soluble in water **f thiocyanate** $Fe(CNS)_2 3H_2O$ = 226 04 F sulfocyanide Green crystals, soluble in water or alcohol **f thiosulfate** FeS_2I_3 = 167 99 A pale-green crystalline powder **f titanate** $FeTiO_3$ Ilmenite **f tungstate** $FeWO_4$ See *ferberite, wolframite*

ferrovanadium An alloy of iron and vanadium used in the manufacture of steel for automobile parts

ferroxyl indicator A jelly of potassium ferrocyanide and phenolphthalein in agar-agar, used to test for the corrosion of iron A pair of iron wires dipped into it will turn red (cathode) and blue (anode)

ferrugineous Ferruginous

ferruginous (1) Containing iron (2) A drug whose therapeutic effect depends upon the presence of iron, *e g*, chalybeates

ferrum The official Latin for iron **f reductum** A mixture of iron and Fe_3O_4 obtained by the reduction of Fe_2O_3 in a stream of hydrogen ferry metal Frary's metal

fertiliser Fertilizer

fertilizer (1) A plant food which is added to the soil, as, potassium salts, nitrates, phosphates and calcium salts (2) Manure **f grade** The minimum guaranteed plant food expressed in terms of *nitrogen*, available *phosphoric acid*, and water-soluble *potash*

Ferula A genus of Umbelliferae, yielding asafetida, galbanum, sagapenum and sumbul

ferulaldehyde $C_{10}H_{10}O_3$ = 178 08 *p*-coniferaldehyde, *4*-hydroxy-*3*-methoxy cinnamaldehyde, hadromal Colorless crystals, m 82 5, used in perfumery It occurs in woody tissues and gives a red color with phloroglucinol in HCl

ferulene $C_{15}H_{26}$ = 206 20 A dihydrosesquiterpene from fennel, d 0 870, b $_{7mm}$126

ferulic acid $C_{10}H_{10}O_4$ = 194 1 Ferulaic acid, m-methoxy-p-hydroxycinnamic acid A constituent of asafetida and black fir resin occurring in colorless rhombic needles, m 169, decomp by heat, soluble in hot water, alcohol, or ether Cf *coniferol* **iso-** Hesperitinic acid **hydro-** $C_{10}H_{12}O_4$ = 196 1 Colorless crystals, m 89, soluble in water or alcohol

fervanite A vanadium mineral similar to steigerite, q v

Féry calorimeter A thermo-electric device for determining the calorific power of foods **F refractometer** An instrument for the direct reading of the refractive index of any transparent liquid, accuracy 0 0001, range 1 3300–1 6726

Feser lactoscope A graduated glass cylinder used for the determination of fat in milk by its degree of translucency

fetron A mixture of 3 parts stearic acid and 97 parts petrolatum, used as a base for ointments

feverbark See (1) *Alstonia*, (2) *Cinchona*

feverfew The herb of *Pyrethrum parthenium*, a Compositae, used as carminative Cf *pyrethrum camphor*

fiber A long, thread-like cell or tissue of vegetable or animal origin, used for paper (cf *tracheid*), textiles, cordage, wickerwork and brushes **animal-** A f obtained from animals, as alpaca, bristles, camel-hair horse-hair silk, and wool **artificial-** (1) F made from mineral matter, as, spun glass, metallic threads, slag wool Cf *mineral f* (2) F imitating natural f, as, rayon **bast-** A f from the bast of plants, as hemp, jute, kapok, ramie **cordage-** A fiber used for making ropes *e g*, coir, manila hemp, hemp, sisal, New Zealand flax **crude-** The vegetable material left after boiling the fat-free ground plant successively for ½ hour in 1 25 % sulfuric acid and 1 25 % caustic soda **horn-** Vulcanized f, leatheroid A hard, tough, bone-like substance used in electric insulation, and made by compressing alternate layers of paper treated with acids or zinc chloride **linen-** A fiber used for making threads or yarn from flax **mineral-** Asbestos- Cf *artificial f* **staple-** Fiber, either natural or synthetic, in comparatively short and uniform lengths, from which it is spun either alone or in admixture into continuous threads Natural fibers usually occur in this form, but rayon (which is manufactured as a continuous filament for silk-type fabrics) has to be cut accordingly if used for making cotton-type fabrics World production (1940) 1250 million lbs **sugarcane-** Bagasse **synthetic-** Yarn **vegetable-** A fiber obtained from plants

1 Hair fibers (from seed hair[1a])g

Gossypium 1 (s ton

Eriodendron is o)ok

Calotropis)y itbetable silk

2 Bast fibers (from stalks and stems)

Linaceae, *Linum*	flax
Moraceae, *Cannabis*	hemp
Malvaceae, *Hibiscus*	Deccan hemp
Abutilon	Chinese jute
Leguminosae, *Crotalaria*	sunn hemp
Spartium	Spanish broom
Urticaceae, *Boehmeria*	ramie
Tiliaceae, *Corchorus*	jute
Umbelliferae, *Eryngium*	caraguata

3 Cordage fibers (from vascular bundles)

Musaceae, *Musa*	abaca
Amaryllidaceae, *Agave*	sisal
Furcraea	Mauritius hemp
Liliaceae, *Sansevieria*	bowstring hemp
Phormium	New Zealand hemp
Bromeliaceae *Tillandsia*	veget horsehair
Palmae, *Cocos*	coir
Attalea, Leopoldina	piassaba
Borassus	palmyra
Caryota	kittool
Raphia	raffia
Sabal	sabal

4 Paper fiber (from gramineae and coniferae)

Wheat, oat, barley etc	straw fiber
Pine, fir, etc	wood fiber
Cyperus papyrus	papyrus
Stipa species	esparto
Saccharum officinarum	bagasse

vulcanized- Horn-

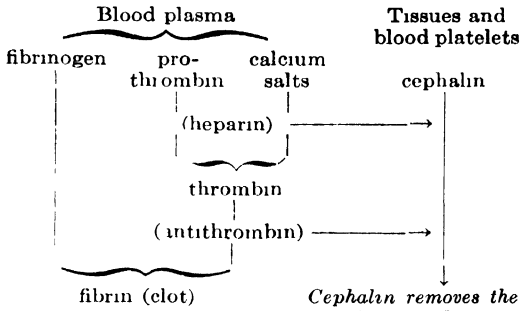
fibestos Trade name for a cellulose acetate plastic

fibre Fiber

fibril A small fiber or filament

fibrin A protein from blood (0 1–0 4 %) and muscle tissue, formed from fibrinogen by the action of ferments It occurs in colorless or yellowish, horn-like masses, insoluble in water but swelling in slightly acid solution to a gelatinous solution, used technically in photography, in the dye, textile and leather industry, also in the manufacture of various utensils, and foods **muscle-** Syntonin **vegetable-** Gluten **Gluten-fibrin** A by-product in the manufacture of starch Yellow, horn-like masses, insoluble in water soluble in hot alcohol, alkalis or dilute acids It has a high food value

fibrinogen A globulin of the blood plasma which gives fibrin by the action of paraglobulin or of the fibrin enzyme, thrombin It is essential in the coagulation of blood, which can take place only in the presence of cephalin (from ruptured tissue) which removes the interfering heparin and antithrombin, according to Howell



fibrinolysin A substance formed in the blood that causes the fibrin clots to dissolve

fibrinolysis The hydrolysis of fibrin

fibrogen A highly-purified lung tissue, rich in fibrinogen and used as a hemostatic

fibroin $(C_{15}H_{23}O_6N_5)_x$ = (369 2)x A constituent of silk and spider webs It is an indigestible protein, and contains diketopiperazine in its molecule

fibrolite Al_2O_3,SiO_2 Sillimanite The yellow, native aluminum silicate

fibrolysin A sterilized 15 % solution of thiosinamine and sodium salicylate, used as a hypodermic injection for dissolving or breaking up fibrous tissue

fibroplastin Paraglobulin

fibrox A fibrous variety of siloxicon (q v) used as a heat insulator

F I C An abbreviation for Fellow of the Institute of Chemistry

fichtelite $C_{18}H_{32}$ = 248 25 A white, crystalline hydrocarbon, m 46, occurring in the peat beds of the Fichtelgebirge, Bavaria

ficin A proteolytic, crystalline enzyme, the active principle of oje, the milky sap of the fig tree, which dissolves live *Ascaris* (parasitic worms)

F I D An abbreviation for "Food Inspection Decisions" of the Department of Agriculture, U S A

field (1) The region or space within which a phenomenon occurs (2) In optics, the area visible at any one time through an instrument, *e g* a microscope **atomic-** The space surrounding an atom which cannot normally be penetrated by other atoms **electric-** The space surrounding an electrically-charged body in which its action is perceptible **electromagnetic-** q v **gravitational-** The region surrounding the earth in which bodies are attracted towards its center **intra atomic-** Dynad **inter atomic-** The space between dynads Cf *molecular diagram atomic radius* **magnetic-** The space surrounding a magnet in which its magnetic action is perceptible **molecular-** The space surrounding a molecular which is impenetrable by other molecules

field-intensity The intensity of the energy of a limited region or space **electric-** The energy of an electric field, measured by the force exerted on unit charge, $H = q/r^2$, in which H is the field intensity at a point, distant (r) from an electrical charge (q) in a vacuum In a dielectric the equation becomes $H = q/Kr^2$, where K is the dielectric constant of the medium **magnetic-** The energy of a magnetic field, measured by the force exerted at a point by an isolated magnetic pole of strength m $H = m/\mu r^2$, where μ is the magnetic permeability, and r the distance of the point from the magnet

fig The dried fruit of *Ficus carica*, an Urticaceae, used as food and mild laxative Cf *cradin*

figwort Scrophularia

filament A fine thread-like body or structure **carbon-** A fine thread of graphite or carbon, used in electric bulbs (lamps, valves) **nuclear-** The thread-like chromatin in the nucleus of a cell **protoplasmic-** A thread-like protoplasm, as cilia, or flagella **tungsten-** A fine thread of tungsten, used in electric bulbs, *e g*, tungsten or mazda lamps

filamentous (1) Having the shape of a filament (2) A growth of bacteria composed of long, interwoven threads

filar micrometer A scale-attachment for microscopes, 0 001 mm can be estimated, and exact measurements of microscopic objects made

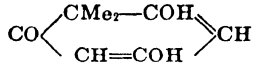
file A very hard steel tool with a rough surface of fine sharp ridges, used for smoothing or shaping objects **rat-tail-, round-** A tool used for smoothing out round holes, as in a cork or rubber stopper **triangular-** A tool used for cutting glass tubing by making a sharp cut with one of the edges, and then breaking the tube

Filices [Sing Filix, q v] Ferns An order of Pteridophytae or spore-bearing plants which yield aspidium, polystichum, filicin, etc

filicic acid $C_{14}H_{14}O_5$ = 262 2 Colorless crystals, decomp 184 6, insoluble in water or alcohol, soluble in ether or carbon disulfide, a constituent of *Aspidium* species, and a decomposition product of filicin (2) $C_{36}H_{42}O_1$ = 682 32 White crystals, m 125, from Aspidium species Cf *filixic acid, filicinic acid*

filicin $C_{35}H_{40}O_{12}$ = 652 4 Filicic acid anhydride A constituent of the root of *Aspidium filix-mas*, and the active principle of its fluid extract, used as a vermifuge

filicinic acid $C_8H_{10}O_3$ = 154 07



A reduction product of filmaron and filixic acid

filiform A uniform growth of bacteria along the line of inoculation

filix [pl , Filices, q v] A fern, as filix-mas, the male fern **f extract** A fluid extract made from the root of the male fern, *Aspidium filix-mas* It contains filicic acid, filicin, albaspidin, aspidinol, and filmaron

filitannic acid The tannin of the male fern

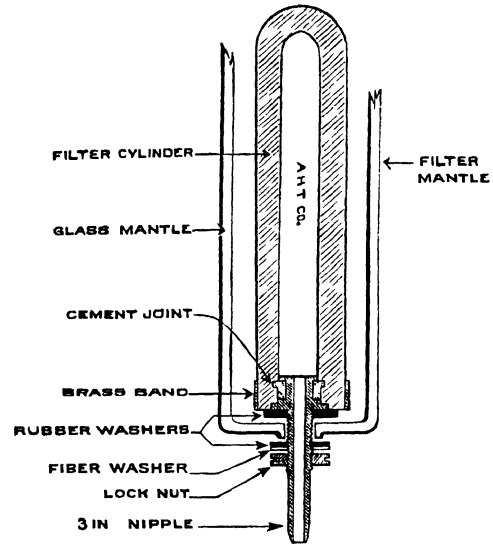
filixic acid $C_{35}H_{38}O_{12}$ = 650 29 An acid, m 183, from filix extract Cf *filicic acid, filicinic acid*

fillers Materials used (1) to close the pores of paper, (2) to increase the bulk or weight of substances (loading), (3) to modify the properties of synthetic substances or insulating compositions Cf *finishing materials, adulterants*

film (1) A membrane or covering layer (2) A light-sensitive, flexible transparent sheet coated with opaque silver salts for taking photographs (3) The transparent developed form of (2) **motion picture-** A f used to project moving scenes on a screen **silent-** runs 16 frames per second **sound-** 24 frames per second For scientific purposes the rate of projection may be *bradykinetic-* (slower) *isokinetic-* (same) or *tachykinetic-* faster than the rate at which the photograph was taken

filmaron $C_{47}H_{54}O_{16}$ = 874 5 An amorphous substance, m 60, obtained from and considered to be the anthelmintic principle of filix extract

filter (1) A strainer or purifier (2) In chemistry, a porous material through which a liquid passes either for the purpose of (a) removing a precipitate or suspended matter, or (b) straining or clarifying the liquid Cf *membrane* (3) In physics, an absorbing, semi-transparent substance, *e g* , light filter **asbestos-** A mixture of asbestos and glass wool used for filtration **Berkefeld-** A tube made of diatomaceous earth, used for filtering and sterilizing liquids (see figure) **Chamberland-** A tube made of porous clay and used for the filtration and sterilization of liquids, vaccines, or sera **folded-** A piece of filter paper, folded in alternate directions, and used for the rapid filtration of liquids, (not in quantitative analysis) **gas-** A device for removing solid or liquid impurities from gases **glass-** (1) A Gooch type of crucible made of glass, and having a sintered glass base of appropriate pore size Used in quantitative analysis, no additional filter pad is required (2) Glass wool **Gooch-**



Berkefeld filter

A platinum, glass or porcelain crucible with a perforated bottom covered by asbestos fibers A precipitate may thus be heated and weighed without transference **Kelly-** A leaf filter for filtering slurries under pressure **light-** Color screen **membrane-** A disk of nitrocellulose with porosity generally from 0 03–3 microns used in analytical and bacteriological work **paper-** F paper **paper**

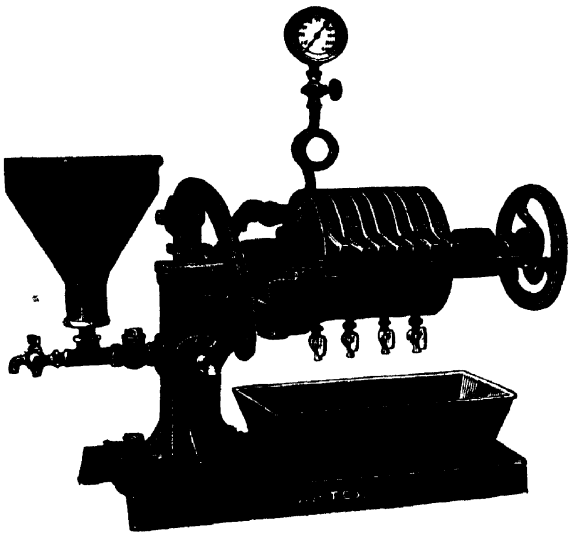
	Time*	Pore sizes of materials not passing
coarse	1–10 sec	0 5–3μ (kaolin)
medium	10–30 sec	0 1–1μ (bacteria)
fine	30–100 sec	0 05–0 5μ (colloidal gold)
ultra fine or colloidal		
fast	1–5 min	(fine colloids)
medium	6–30 min	(benzopurpurin dyes)
fine	50–150 min	(albumen)
finest	<150 min	(congo-red dyes)

* *The time for 100 cc distilled water to pass through the filter*

pulp- A mass of filter paper moistened and made into a pulp, used similarly to glass wool for filtration **Pasteur-** A tube made of unglazed porcelain through which liquids to be filtered are forced by pressure or vacuum **Pukal-**

An Erlenmeyer-shaped piece of unglazed porcelain used for the filtration of vaccines sera or antitoxins **stream line-** See *streamline filtration filter press* **ultra-** See *ultrafiltration Zsigmondy membrane filters* **vacuum-** See *vacuum*

f aid A powder (*e g* kieselguhr) added to the solution to be filtered, it forms a porous bed on the f and renders filtration easier **f apparatus** Any device used for filtration The simplest is a funnel with filter paper others utilize porous materials through which liquids are forced, either by pressure or by vacuum **f bag** A sack made of felt, used for straining liquids **f cloth** A piece of strong canvas for use in a filter press **f cone** A cone made of porous materials as alundum or paper used for filtration **f crucible** A crucible of platinum nickel, or porcelain with a porous bottom, and covered by asbestos used for quantitative filtration Cf Gooch crucible **f cylinder** A porous tube used as a f **f dish** A conical dish made of porous material and fitting into a funnel used for filtration instead of filter paper **f flask** A conical flask with side-neck made of heavy glass and used for vacuum filtration **f mantle** A glass or metal tube around a f cylinder **f paper** An unsized porous paper used for filtration It is made in various textures and in many grades of purity (*qualitative-*) A common or ordinary filter paper used for straining clearing and purifying solutions or the collection



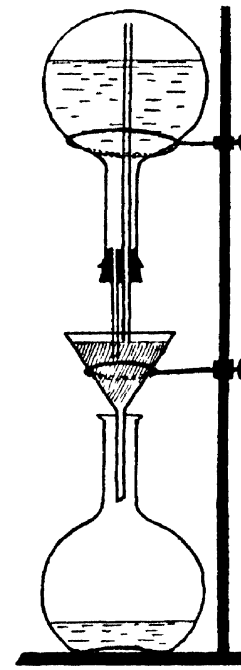
Filter press

of precipitates or suspended particles (*quantitative-*) A high-grade filter paper resistant to dilute acids and consisting of pure cellulose with a very small ash (less than 0 5 mg) It is prepared by repeated acid and water washings of the paper pulp **f paper analysis** (1) Identification of substances by a spot test or f paper test (2) Capillary analysis (3) The germination of seeds on moist f paper and examination of the exudation from the rootlets (*e g* by fluorescence methods) **f paper test** A color-reaction made with minute quantities of materials and reagents with which a filter paper is successively moistened **f press** A machine for the filtration of large amounts of liquids It consists essentially of an iron-frame on which perpendicular iron-plates are suspended and pressed together by a screw The liquid to be filtered is pumped into canvas-bags hanging between the plates and when the bags are filled the tightening of the screw furnishes the pressure necessary for filtration (see figure) **f pump** A pressure or vacuum pump used for filtration Laboratory pumps are usually small vacuum pumps connected to the water faucet and operated by the water current drawing the air from a container (see figure) **f tube** (1) A glass tube to connect a Gooch crucible to a filter flask (2) Bougie

Water filter pump

filtrate The liquid that has passed through a filter

filtration The process of separating a solid from a liquid by means of a porous substance through which the liquid passes (Cf *decantation straining centrifugation syphoning*) **automatic-** A convenient method of filtering in the laboratory (see figure) **centrifugal-** The separation of filtrate from precipitate by centrifuging **direct-** The ordinary way of separating a solid from a liquid by means of a filter through which the liquid passes by gravitation **edge-** Stream line f **forced-** Centrifugal-pressure-, or vacuum-filtration **meta-** See *metafiltration* **pressure-** Forcing the liquid by air-pressure through the filter **stream line-** See *stream line* **vacuum-** Forcing the liquid by suction through the filter



Automatic filtration

filtros. A porous, acid-proof mineral used for filtration.

fimbriate. A growth of bacteria characterized by large and extremely long filaments on the border of the colony.

fineness. (1) The state of sub-division of a powder or granulated substance. It is determined by passing the substance through a series of sieves (see table). (2) The purity of a gold alloy expressed in parts per 1000. See *gold.*

Sieve No.	Fineness	Average diameter of particles
100	extremely fine powder	0.14 mm
80	very fine powder	0.17 mm
60	fine powder	0.23 mm
50	moderately fine powder	0.28 mm
40	fine coarse powder	0.38 mm
30	moderately coarse powder	0.54 mm
20	coarse powder	0.85 mm
12	very coarse powder	1.47 mm
6	granular powder	3.00 mm

finings. Substances added to a fermented beverage to clear it from suspended matter (yeast etc.), and render it brilliant; *e.g.*, isinglass.

finishing material. A substance used in industry for the last or finishing stage of manufacture, as in the textile industry: (a) Substances making fibers soft, hygroscopic and pliable, *e.g.*, glycerin, sugar, fats, coconut oil, calcium chloride, etc. (b) Coloring substances, *e.g.*, dyes. (c) Waterproofing substances, *e.g.*, rubber solutions. (d) Fire-proofing substances, *e.g.*, waterglass. (e) Antiseptic substances, *e.g.*, phenol. (f) Inert substances added for weighting, *e.g.*, barytes, gypsum, chalk, clay.

Finsen lamp. A mercury-vapor arc lamp in a quartz container; used as a source of intense ultra-violet rays in the treatment of skin diseases.

fiolax. A trade name for an alkali-free glass resistant to sudden temperature changes; used for test-tubes, and other chemical glassware.

fir. (1) A coniferous tree of the Abies genus. (2) Same as firkin. (3) A *Pinus* species. **balsam of-** Canada balsam. **oil of-** Pine oil.

fire. A bright flame caused by combustion. **f. air.** Scheele's name for oxygen. **f. brick.** A fire-clay or fire-resistant brick for lining furnaces, containing as crystalline phases: mullite, cristobalite and tridymite. **f. clay.** Stowbridge clay. A refractory clay containing large proportions of silica and alumina in comparison with the basic oxides. **f. damp.** An explosive mixture of methane and air. It occurs in coal mines and is detected by the "corpse light" in a Davy lamp. **f. extinguisher.** An agent that extinguishes fires. It may act either by cooling the burning substance (*e.g.*, water), or by covering it with a medium in which combustion cannot occur; as, carbon tetrachloride, sand, fire-foam. **f. foam.** A colloidal blanket of alumina and carbon dioxide by which fires are extinguished, *e.g.*, in oil-tanks. The blanket is produced by spraying over the burning surface two solutions, one containing alum, the other sodium carbonate and glue, or sodium silicate. **f. point.** The minimum temperature at which an inflammable oil will burn continuously. Cf. *flash point.* **f. proofing.** See *fireproofing.* **f. tester.** A device for determining the flash-point of illuminating oils.

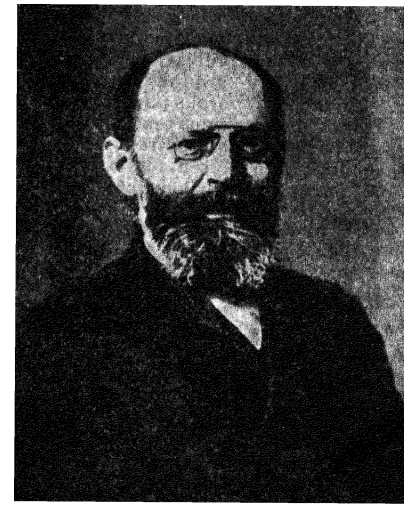
firepolishing. To smooth the sharp edges of glass by slightly fusing them in a flame.

fireproofing. The coating or impregnation of a combustion material with a substance that makes it less combustible; as, waterglass for textiles and wood, or selenium for wire insulators in telephone switchboards.

fireworks. A pyrotechnic display such as colored flames, and sky-rockets. **daylight-** F. utilizing colored smokes for effects.

firkin. (1) Fir. An obsolete measurement: 9 gallons = 34.06799 liters. (2) A wooden vessel.

firn. Snow in a granular, compact form.



Emil Fischer.

(From Moore "History of Chemistry." McGraw-Hill Book Company, New York, N. Y.)

Fischer, Emil. 1852–1919. A German chemist noted for his work in biochemistry and on the synthesis of polypeptides and carbohydrates. **F., Hans.** A German biochemist noted for his work on blood, and synthesis of hemin (Nobel prize 1940).

fisetic acid. Fisetin.

fisetin. $C_{15}H_{10}O_6$ = 285.1. Fisetic acid. Tetraoxymethylanthraquinone, *3.7.3'.4.'*-tetrahydroxy flavone. A yellow coloring matter from the wood of *Quebracho colorado*, fustic, or *Rhus cotinus.* Yellow, crystalline, glistening needles, m.360. Cf. *fustin.* **iso-** Luteolin.

fish bean. See *tephrosia.* **f. berry.** Cocculus indicus, Indian berry, oriental berry. The dried fruit of *Anamirta cocculus*, a Menispermaceae. It is an active narcotic poison. **f. glue.** See *isinglass.* **f. guano.** F. scrap, f. tankage. A fertilizer made from non-edible fish and from offal (heads, tails, etc.) from fish canneries by cooking, expressing the oil, drying and grinding. It contains 6–10 % N,

0 4–8 % P_2O_5 **f oil** Liquid fats obtained from fishes as dugong, porpoise seal sperm and sardine They are characterized by their great absorption of oxygen without drying to a varnish and yield little or no elaidin They are colored dark red by concentrated acids **f poison** (1) A ptomaine produced by the decaying proteins of fishes (2) The poisonous substances produced by certain species of fishes as fugu toxin, or ichthyotoxin (3) A poisonous substance used by natives to stupefy fish prior to catching them usually derived from *Derris Cracca* and *Lonchocarpus* species **f scrap** F guano **f tankage** F guano

ission A division (1) In biology the separation of a single cell into two or more equal parts capable of developing to the original size of the parent cell Cf *karyokinesis* (2) In astronomy the separation of a spherical and semi-liquid body into two parts that revolve around each other Certain double stars are assumed to have been formed by fission from a single star

istelin The aglucone of the glucoside fustin Yellow needles m 360

ittig, Rudolf 1835–1910 A German chemist noted for organic research **F reaction** *Fittig synthesis* **F synthesis** The formation of an aromatic homolog from an aryl iodide or bromide by means of an alkyl iodide or bromide and metallic sodium *e g*

$$RBr + R'Br + 2Na = R—R' + 2NaBr$$

ve finger grass Cinquefoil The herb of *Potentilla reptans* a Rosaceae used as a febrifuge and astringent **American-** The herb of *P canadensis* used similarly Cf *tormentil*

xanal An analytical chemical accurately weighed and sealed in a glass ampule used for the rapid preparation of volumetric solutions Error 0 2 % Cf *analoid*

xation The process of rendering permanent (1) In photography the process of dissolving light-sensitive silver salts from plates films or paper thus making them insensitive to the further action of light (2) In microscopy the preparation of minute structures in their original form on a slide (3) In immunology, the prevention of hemolysis by the complement q v (4) In industry the combining of atmospheric nitrogen in the form of a useful compound See *nitrogen fixation* **complement-** See *complement fixation* **nitrogen-** See *nitrogen fixation*

xative A substance used to make an object permanent as (a) a mordant used in dyeing (b) a varnish for pastel paintings (c) an agent employed in botany zoology and histology to make permanent tissues *E g*

	1	2	3
ormaldehyde (40 %)	6 5	12	10 cc
lacial acetic acid	2 5	4	2 cc
lcohol 95 %	55	34	30 cc
ater	45	56	60 cc

1 *Formal-acetic-alcohol* for all plant specimens nd many animals

2 *Carl s solution* for insects and arthropods move specimen after 42 hours and transfer to) % alcohol

3 *Kahle s solution* for insects insect eggs and embryos

(d) in perfumery **a f** makes a substance less volatile and more permanent as methylanisate benzyl cinnamate benzoisoeugenol

fixator Amboceptor

fixed Made permanent or definite **f air** An early name for carbon dioxide **f oils** A liquid fat which absorbs oxygen and becomes resinous (drying oils) or remains liquid (non-drying oils) as compared with evaporating oils (essential or volatile oils) **f proportions, Law of** See *constant proportions* **f white** Barium sulfate

fixing The act of rendering permanent

fixing-bath A 20 % solution of sodium thiosulfate used for the fixation of photographic plates films or papers **hardening-** A freshly mixed solution of

A 500 gm sodium hyposulfite
2000 cc water
B 45 gm sodium sulfite
25 gm chrome alum
10 gm sulfuric acid
500 cc water

Used for hardening and fixing photographic films plates or papers

Fizeau, Armand, Hippolyte, Louis 1819–1896 A French physicist noted for research on the interference of light and heat and the determination of the velocity of light and electricity

fl An abbreviation for fluid **fl dr** A fluid dram or drachm **fl oz** A fluid ounce

Fl An abbreviation for fluorine, F

flag See *calamus*

flagella A thin hair-like protuberance on protozoa

flagstaffite $C_{12}H_{24}O_3$ An orthorhombic mineral m 99–105

flame A source of heat consisting essentially of a stream of gas or vapor heated as the result of chemical reaction usually oxidation The luminosity of the flame may depend on glowing solid particles *e g* dust carbon etc **It** consists usually of a number of cones the temperature of which depends upon the degree of combustion taking place **acetylene-** The hot ignited gases emerging from a blowpipe fed with acetylene and compressed air or oxygen **Bunsen-** The flame produced by a bunsen burner burning gas it is either non-luminous (with air) or luminous (without air) **dark-** A non-luminous flame *e g* produced by burning pure hydrogen in oxygen or ethylene in chlorine **hydrogen-** A bluish or non-luminous flame produced by the oxidation of hydrogen in air **luminous-** A bright or pale colored flame *e g* candle flame sodium light **non-luminous-** Dark- **oxidizing-** The non-luminous flame of a gas burner used in blowpipe analysis for oxidation **reducing-** The luminous blowpipe flame It owes its properties to the presence of solid particles of carbon **oxy-hydrogen-** The hot gas-mixture from a blow-pipe fed with compressed hydrogen and oxygen **solar-** Protuberances on the sun consisting of hydrogen flames or luminous gases

f coloration A qualitative test performed by placing the substance moistened with hydrochloric acid on a platinum wire in the non-luminous flame of a bunsen burner and observing the resulting color of the flame

Bright yellow	sodium
Brick red	calcium
Crimson	strontium
Red	lithium
Green-yellow	molybdenum, boron
Green	barium
Blue	indium
Blue-white	lead, arsenic, antimony
Purple	potassium
Blue, changing to green	copper

f reactions See *Bunsen, f tests* **f spectra** Spectra produced by the vapors of elements, used for the spectroscopic detection, identification or determination of elements The characteristic lines of the f spectra are due to electrons falling back to normal orbits from the lowest or more easily excited levels Cf Arc and spark *spectrum* **f temperature** The following temperatures are produced by different sources of heat (Féry, 1907)

alcohol and air	1705°C
gas (bunsen burner—no air)	1712°C
gas (bunsen burner—½ air)	1812°C
gas (bunsen burner—full air)	1871°C
hydrogen and air	1900°C
gas and oxygen	2200°C
hydrogen and oxygen	2420°C
acetylene and air	2458°C
acetylene and oxygen	3000°C
thermite (Al + Fe)	3000°C

f tests Qualitative test made with the bunsen burner, such as the flame reactions or colorations, bead tests, and other blowpipe tests

flamo A compressed natural gas shipped in cylinders

flash (1) A sudden, luminous and temporary flame (2) A volatile mixture, thrown on the fires of a kiln to produce a colored glaze on bricks or tiles which are being baked, thus, **black-** containing manganese **zinc-** containing zinc salts (yellow and green shades)

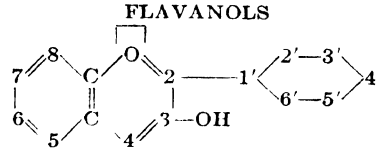
flash-light A mixture of combustible solids used in photography, as magnesium powder

flash point The lowest temperature at which the vapors of a liquid may be ignited momentarily It is a constant of oils Cf *auto-ignition* **f** *fireposnt* **f tester** A device for heating substances gradually to the temperature at which spontaneous combustion of their vapors occurs, used in the analysis of oils

flash spectrum The reversal of the Fraunhofer lines of the solar spectrum in the form of a bright line spectrum, immediately before a total eclipse

flask A glass, metal, paraffin, or rubber receptacle or vessel for holding solids, liquids, or gases **Aberhalden-** A small glass vessel intermediate in shape between a beaker and an erlenmeyer **acetylation-** A small pear-shaped flask used in menthol determinations **assay-** A conical glass beaker used for precipitation **boiling-** A spherical glass vessel with long neck **delivery-** A f graduated to deliver a specified volume of liquid as distinct from a f containing this volume Cf *volumetric* f **Dewar-** Vacuum flask, with side tube in its neck **erlenmeyer-** A conical-shaped flask with narrow neck and wide flat bottom **filtering-** An erlenmeyer flask with heavy walls and side

FLAVANOLS



A Anthocyanidins

f = flavanol or 3-hydroxybenzopyran

pelargonidin	5 7 4 -trihydroxy-*f*
fisetinidin	7 3 4 -trihydroxy-*f*
cyanidin	5 7 3 4 -tetrahydroxy-*f*,
delphinidin	5 7 3 4 5 -pentahydroxy-*f*
peonidin	3 -methoxy-5 7 4 -trihydroxy-*f*,
oenidin	3 4 -dimethoxy-5 7 5 -trihydroxy-*f*,
hirsutidin	3 5 -dimethoxy-5 7 4 -trihydroxy-*f*
myrtillidin	7-methoxy-5 3 4' 5 -tetrahydroxy-*f*,

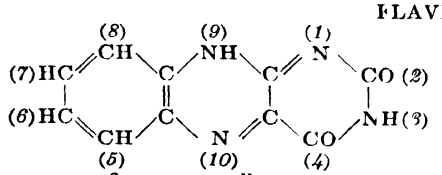
B Anthocyanins

c = cyanidin or tetrahydroxy-*f*

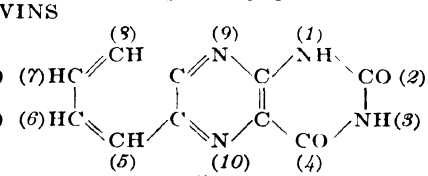
p = pelargonidin or trihydroxy-*f*

chrysanthemin	3-glucosidyl-*c*
pelargonenin	5-glucosidyl-*p*
oxycoccinecyanin	3 -methoxy-3-glucosidyl-*c*
oenin	3-glucosidyl-oenidin
	3-galactosidyl-*c*
pelargonin	3 5 -diglucosidyl-*p*

FLAVINS



flavin or isoalloxazine

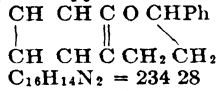


alloxazin

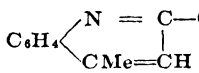
lumilacto flavin	6 7 9-trimethyl-flavin
lumichrome	6 7-dimethyl-alloxazin
lactoflavin	6 7-dimethyl-9(2' 3' 4'-trihydroxy propyl) flavin

tube **mercury-** The commercial unit of measurement of mercury, equivalent to 75 pounds **silica-** A flask made of semi-opaque silica **vacuum-** Dewar vessel A double-walled glass vessel of various shapes, used for holding liquefied gases **volumetric-** A flask with long graduated neck **Wurtz-** Distillation f-

flavan $C_{15}H_{14}O$ = 210 08 *2 3*-Dihydro-*2*-phenyl-*1 4*-benzopyran The heterocyclic hydrocarbon



flavaniline $C_{16}H_{14}N_2$ = 234 28 α-aminophenyl-γ-methylquinoline, *2*-(*p*-aminophenyl) lepidine

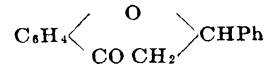


Colorless, long prisms, m 97, insoluble in water, soluble in alcohol, ether or benzene

flavanol $C_{15}H_{10}O_3$ = 238 1 3-hydroxy-flavone, Yellow needles, m 170, soluble in alcohol

flavanols A group of vegetable dyes derived from flavonol (see table)

flavanone $C_{15}H_{12}O_2$ = 224 09 2 3-dihydro-2-phenyl-1 4-benzopyrone, 2 3-dihydro flavone,



trihydroxy-Naringenin

flavaspidic acid $C_{24}H_{28}O_6$ = 444 3 A constituent of the roots of *Aspidium felix mas* or male fern

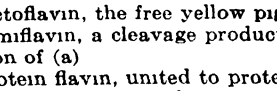
flavazine $C_{16}H_{13}N_4O_4SNa$ The sodium salt of *1-p*-sulfophenyl methyl-*4*-phenyl-diazonium-*5*-pyrazolone, used as a yellow acid dye

flaveanhydride $C_2H_2N_2S$ = 86 2 Cyanogen monosulphydrate, NC CS NH_2 Yellow needles, decomp 88, soluble in water, alcohol, or ether

flavianic acid $C_{10}H_6N_2O_8S$ = 314 0 *2 4*-dinitro-*1*-naphthol-*7*-sulfonic acid Yellow crystals, used in the separation of amines

flavicid $C_{18}H_{22}N_3Cl$ = 315 5 *2 7*-Dimethyl-*3*-dimethylamino-*6*-amino-*10*-methyl acridinium chloride A reddish-brown, water-soluble powder, used as antiseptic

flavin(e) (1) $C_{10}H_6N_4O_2$ = 214 05 Isoalloxazine The heterocyclic ketone



(2) Quercetin (3) One of a group of yellow plant pigments as

(a) lactoflavin, the free yellow pigment

(b) lumiflavin, a cleavage product formed on irradiation of (a)

(c) protein flavin, united to proteins

(d) purine flavin, united to purines

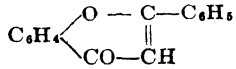
(e) carbohydrate flavin, united to carbohydrates, as in vitamin G

flavine (1) Acriflavine (2) Flavin

flavinduline A yellow dye, 9-phenyl-9αγ-dibenzophenazonium

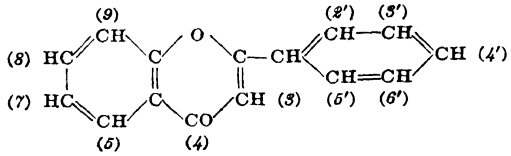
flavol *1 3*-Anthradiol Cf *flavanol*

flavone $C_{15}H_{10}O_2$ = 222 1 2-phenylbenzo-1 4-pyrone, 2-phenylchromone, β-phenylchromon, beta-phenyl-gamma-benzopyron



Colorless needles, m 97, insoluble in water, soluble in alcohol It is present in many flower colors, cf *flavones* **dihydro-** Flavanone

flavones A group of vegetable coloring matters, the hydroxy or methoxy derivatives of flavone (see table) Cf *flavylium, syringetin, anthoxanthin*



Flavone (in *iso*-flavone the phenyl group is at 3) *h* = hydroxyflavone, *h i* = hydroxy-isoflavone

flavanol	3-*h*
chrysin	5 7-di-*h*
daidzein	7 4-di-*h i*
baicalin	5 7 8-tri-*h*
quercetin	2 3′ 4′-tri-*h*
genistein	5 7 5-tri-*h i*
apigenin	3 7 4-tri-*h*
luteolin	5 7 3 4-tetra-*h*
quercitin	3 5 7 3 4-penta-*h*
morin	3 5 7 2′ 4′-penta-*h*
myricetin	3 5 7 3 4 5-hexa-*h*
gossypetin	3 5 7 8 3′ 4′-hexa-*h*
quercetagin	3 4 5 6 7 3′ 4′-hepta-*h*
wogonin	7-methoxy-5 6-di-*h*
hesperetin	4-methoxy-5 7 3-tri-*h*
rhamnazin	7 3-dimethoxy-3 5 4-tri-*h*
rhamnetin	7-methoxy-3 5 2 4-tetra-*h*
Flavone-glucosides	
genistin	7-glucosidyl-genistein
daidzin	7-glucosidyl-daidzin

flavopannin $C_{21}H_{26}O_7$ = 390 2 A monobasic acid from the root of *Aspidium athamanticum*

flavophenine Chrysamine Cf *pannol*

flavopurin $C_{14}H_8O_5$ = 256 13 1 2 7-trihydroxy-anthraquinone, alizarin X, alizarin R G, C A, S D G, and I O A yellow powder, used as a dye

flavopurpurin $C_{14}H_8O_5$ = 256 13 1 2 6-trihydroxy-anthraquinone Yellow needles, m 459, slightly soluble in hot water, soluble in hot alcohol or ether, used as a dye

flavoxanthin $C_{40}H_{56}O_3$ = 584 5 A carotinoid pigment, m 184, from the petals of *Ranunculus acer*

flavor, flavour The taste of a substance

flavoring agents Any substance of a pleasant taste, used to improve the taste or odor of a drug food or beverage The flavor is usually due to some essential oil, *e g*, peppermint, cinnamon clove, lemon extract

flavylium A salt derived from flavones which contains tetravalent oxygen Cf *anthocyanidin*

flax Byssus The bast fiber of *Linum usitatissimum*, or flax plant, an annual herb about two feet high It is grown in Europe and Egypt for the fiber, in the United States, Russia, and Argentine for the seeds (linseed oil) The unbleached flax is used for ropes, twine and coarse fabrics The sunbleached flax or linen is used for fine linens, laces, etc, while linen rags are the stock for the highest quality of paper **earth-** Asbestos **mountain-** (1) A fine silky variety of asbestos (2) The herb of *Linum catharticum*, purging flax, used as a laxative **New Zealand-** See New Zealand *hemp* **stone-** Asbestos

flax seed Linseed

fleabane The herb or seeds of *Erigeron Canadense*, a Compositae, used as a diuretic and tonic

Fleischl hemometer An optical instrument used for determining the percentage of hemoglobin in the blood, by comparing the sample with a set of pale to deep blood color glass-wedges

Fleming tube A glass apparatus used for the absorption of CO_2 in the determination of carbon in steel or iron

Flemming's solution A fixative and preservative for small organisms 25 cc 1 % chromic acid, 10 cc 1 % osmic acid, 5 cc glacial acetic acid and 60 cc water

Fletcher furnace A laboratory furnace burning gas or gasoline, with or without blast, used for metallurgical, or ceramical operations **F burner** A gas ring-burner

flex Flexible insulated copper wire, used for electrical connections

flexibility (1) The property of a substance of bending without breaking, *e g* , a lead pipe (2) Adaptability

flexible Pliable, pliant, capable of being bent or twisted without breaking, *e g* , copper wire, lead tubing

flexile Flexible

flexure Any curved or bent portion or section

flint SiO_2 Flintstone An opaque quartz found in chalk stone, and resembling chalcedony Used in the ceramic and glass industries, and for road-making **f brick** A brick made of powdered flint, used as a fire-brick **f glass** Potash-lead glass A highly refractive and easily fusible glass, used in optical instruments (prisms, lenses) and for chemical apparatus (tubing) **f stone** Flint

float A buoyant, sealed glass tube used in burettes for easier and more accurate reading **f stone** A light, porous quartz that floats on water

floats A finely-ground phosphate rock, used as fertilizer

floccose A growth of bacteria characterized by short, curved chains, resembling wool threads

flocculation The coagulation or coalescence of a finely-divided precipitate

flocculent Woolly or cloudy, flake-like, and non-crystalline, *e g* , a liquid containing irregularly shaped particles In bacteriology, a growth of bacteria characterized by the presence of pseudo-zooglea, *e g* , small, adherent masses of bacteria of various shapes floating in the culture media

flora The plants of a region or geographical district Cf *fauna*

Florence test The formation of brown needles or plate-shaped crystals on addition of a solution of I in KI solution to semen It is a test for spermatic fluid

florentium. Ft The element of atomic number 61, claimed to be discovered in 1924 by Rolla and Fernandez Cf *illinium*

flores (1) The flowers or blossoms of a plant (2) A chemical obtained by sublimation See *flower* **f martiales** Ferriammonium chloride

floridin A variety of fuller's earth from Florida

flotation. A method of concentrating ores by grinding them with a frother, (*e g* , oils or acids) and separating the differentially-moistened or wetted mineral particles by floating them on water, usually agitating the mixture by compressed air The wet gangue settles, and the concentrated ore is skimmed off Cf *wetting, zone, Horwood process, Owen process* **f activator** A reagent producing a metallic coat, as, Na_2S or $CuSO_4$ **f collector** An agent which increases the carrying capacity of air bubbles, as, xanthates **f depressor** An agent preventing the gangue from being carried by the air bubble, as, cyanides **f frother** A reagent producing a foam of stable air bubbles, as, f oils **f oils** Petroleum and wood oils, as, pine oil, tar oil, creosote, which are used to wet the metallic particles **f regulator** A reagent which controls the pH value, as $Ca(OH)_2$ or H_2SO_4

flour Wheat flour, farina tritici The white starchy powder made by bolting wheat In its wider sense any powdered cereal or seed used for food **baker's-** A second grade wheat flour **bleaching-** See *Agene, beta-chlora* and *Golo processes* **buckwheat-** A powder made from buckwheat **enriched-** Plain white flour, to which vitamin concentrates and calcium salts, or a proportion of the wheat germ, have been added **Graham-** An unbolted wheat meal **National-** A war-time enriched f (q v) **patent-** A high-grade, white, wheat meal, which has been bolted and all bran removed **rye-** A powdered rye

flow The motion or passage of a fluid Cf *flux* **cold-** See *cold* **molecular-** The relative number of gas molecules which pass through a fine orifice $Q = p_2 - p_1/(W\sqrt{\rho})$, where Q is the quantity of gas in cc per second which flows through a tube or opening at a difference of pressure $p_2 - p_1$, while ρ is the density of the gas at 1 barye pressure (= M/83 15 + 10 6T), and W is the resistance or work overcome in passing through the orifice For a circular opening in a thin plate $W = 3\ 184/d^2$, and for a tube of length l and diameter d $W = (2\ 3941/d^3) + (3 - 184/d^2)$ **f sheet** The diagrammatic representation of a works process, showing the sequence and interdependence of the successive stages

flowers (1) A chemical obtained by sublimation, usually a metallic oxide, as **f of antimony** (= antimony trioxide), **f of arsenic** (= arsenic trioxide), **f of sulfur** (= sublimed sulfur), **f of tin** (= stannic oxide) (2) The blossoming portion of a plant, consisting normally of a calyx (composed of the sepals), corolla (composed of the petals), and stamens and pistils Many flowers contain anthocyanin or other coloring materials, essential oils and other odoriferous substances The following flowers are official (U S P)

Anthemis	Matricaria
Arnica	Pale rose
Calendula	Red rose
Cloves	Sambucus
Kousso	Santonica

floz Fl oz Abbreviation for fluid ounce

fluavil $C_{20}H_{32}O$ = 288 3 A resinous product derived from guttapercha, m 42, soluble in alcohol

fluctuate To vary or move within certain limits

fluctuation Successive rises and falls

flue A channel for gases or liquids

fluellite AlF_2H_2O = 102 67 Hydrous aluminum fluoride occurring in orthorhombic, colorless crystals, d 2 17, hardness 3

fluid A form of matter that cannot permanently resist any shearing force, however small Such forces cause flow, but fluids do not recover their shapes when it ceases **elastic-** A gas, *e g* , a condition of matter in which the molecules flow

apparently without resistance **inelastic-** A liquid, *e g*, a condition of matter in which the molecules move freely but are restricted by gravitation **perfect-** A hypothetical state of matter in which the molecules yield immediately and offer no mechanical resistance, *e g*, flow without viscosity **viscous-** A syrup or soft mass which flows slowly, *e g*, a very viscous liquid

fluid acetextract A solution made by extracting a drug with dilute acetic acid

fluid-dram A pharmaceutical measurement 1 fl dr = 60 minims = 3 69661 cc or 3 7 ml = 0 125 fl oz (U S A)
1 fl dr = 60 minims = 3 55 cc = 0 125 fl oz (*British*)

fluid extract An alcoholic solution of a drug representing the drug-weight by volume, *e g*, 1 gm of the drug corresponds with 1 cc of fluid extract Cf *tincture*

fluid-friction Viscosity

fluid-ounces Floz A pharmaceutical measurement of volume
1 fl oz = 29 57 cc or 29 6 ml = 8 fl dr = $\frac{1}{128}$ Am gallons (U S A)
1 fl oz = 28 41 cc = 8 fl dr = $\frac{1}{160}$ Imper gallons (*British*)

fluid-wax Liquid waxes obtained from the oils of marine animals They consist of esters of mono-atomic alcohols, with traces of glycerides

fluidity The property of flowing easily, as opposed to viscosity It is measured in ρ = rhe, the reciprocal of poise, (q v)

fluo- (1) A prefix indicating the presence of fluorine, *e g*, fluobenzene, fluoform, etc (2) A prefix indicating the property of fluorescence, *e g*, fluoflavine, fluorane

fluobenzene C_6H_5F = 96 1 Fluorobenzene, phenyl fluoride Colorless liquid, d 1 023, m −41 2, b 86, soluble in alcohol

fluobenzoic acid $C_7H_5O_2F$ = 140 1 Fluorobenzoic, fluorbenzoic acid Colorless rhombic crystals, m 182, soluble in alcohol, ether, or hot water

fluoborate A salt of fluoboric acid containing the monovalent BF_4— radical, *e g*, ammonium fluoborate, NH_4BF_4

fluoboric acid HBF_4 = 87 8 The hypothetical acid from which the fluoborates are derived

fluocerite $(Ce,La,Nd,Pr)_2OF_4$ A rare earth mineral containing the fluorides of the ceria-earths

fluochromate A salt of fluochromic acid containing the monovalent CrOF— radical

fluochromic acid HCrOF = 88 1 A monobasic acid

fluoflavine $C_{14}H_{10}N_4$ = 234 1 A fluorescent substance, m 360, soluble in alcohol or ether

fluoform See *fluoroform*

fluogermanate M_2GeF_6 A salt, derived from fluogermanic acid

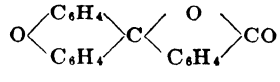
fluogermanic acid H_2GeF_6 = 188 6 Hydrofluogermanic acid An acid obtained by passing GeF_4 into water

fluohydric acid Hydrofluoric acid

fluomethane. Fluoromethane

fluoplumbic acid H_2PbF_6 = 323 2 Hydrofluoplumbic acid A white powder obtained by passing PbF_4 into water

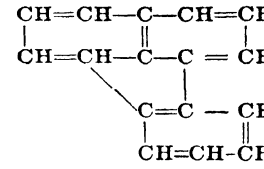
fluoran(e) $C_{20}H_{12}O_3$ = 300 20 o-phenolphthalein-anhydride



Colorless needles, m 182, soluble in alcohol or acids It is an intermediate in the manufacture of dyes

fluorandiol Fluorescein

fluoranthene $C_{16}H_{10}$ = 206 16 Idryl A hydrocarbon in coal tar



Colorless monoclinic needles, m 110, b 250, soluble in hot water, alcohol, ether, carbon disulfide or glacial acetic acid

fluoranthraquinone $C_{15}H_7O_2$ = 219 1 Colorless crystals, m 188, soluble in alcohol

fluorapatite The mineral $CaF_2\,3Ca_3(PO_4)_2$ Cf *apatite*

fluoration The introduction of fluorine into an organic molecule

fluorbenzene See *fluobenzene*

fluorbenzoic acid See *fluobenzoic acid*

fluorometry The measurement of fluorescence Cf *fluorescence analysis*

fluorene $C_{13}H_{10}$ = 166 15 α-Dipheneylene-methane $C_6H_4\langle CH_2 \rangle C_6H_4$ Fluorescent, colorless scales, m 113, b 295, insoluble in water, soluble in alcohol, ether, carbon disulfide or benzene It occurs in coal tar and is used in the manufacture of dyes Its radicals are fluoryl and fluorylidene **amino-** Fluoryl amine **benzo-** Chrysofluorene **chryso-** See *chrysofluorene* **di-** See *difluorene* **dibenzo-** q v **dinaphtho-** Dibenzofluorene **naphtho-** q v **oxo-** Fluorenone* ***ms*-phenyl-** Diphenylene dimethyl ethane **picene-** q v

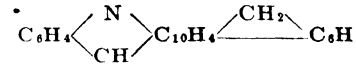
f alcohol $C_{13}H_{10}O$ = 182 15 Diphenylene-carbinol, fluorenol*, $C_6H_4\,CHOH\,C_6H_4$ Colorless crystals, m 153, soluble in alcohol **f carboxylic acid** $C_{14}H_{10}O_2$ = 210 15 Diphenylene acetic acid

fluorenic acid $C_{14}H_{10}O_2$ = 210 08 Colorless crystals soluble in water or alcohol

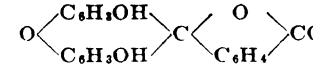
fluorenol* Fluorene alcohol

fluorenone* $C_{13}H_8O$ = 180 15 Diphenylene-ketone, oxofluorene, $C_6H_4\langle CO \rangle C_6H_4$ An oxidation product of fluorene It occurs in yellow prisms m 84, b 341, soluble in alcohol

fluoren-naphthacridine $C_{24}H_{15}N$ = 317 13 The heterocyclic system



fluorescein $C_{20}H_{12}O_5$ = 332 20 Uranin A, 3 6-dihydroxyfluoran, resorcinolphthalein, resorcinphthalein, fluorandiol, dioxyfluoran



An orange-red powder, insoluble in water, ether, or chloroform, soluble in hot alcohol, hot acetic acid, and alkalis with orange color and green fluorescence, used in the manufacture of eosin and other dyes and as an indicator pH3 6 (yellow) to pH5 6 (fluorescent) **dihydroxy-**

Gallein **dimethyl-** Cresorcin **sodium-** Uranin A **tetrabromo-** Eosin **tetrabromodichrolo-** Phloxin **tetraiodo-** Erythrosin

f paper Zellner's paper Paper impregnated with a solution of fluorescein in alcohol, and used as an indicator *potassium-* Potassium fluorescein *sodium-* Uranin

fluorescence The transformation of light by matter, *e g* , the property of certain substances to radiate, when illuminated, an unpolarized light of a different, usually greater wavelength It may occur with solids, liquids or gases, and is due to the return of electrons displaced by the

FLUORESCENCE OF SOLIDS

Substance	Exciting light	Reflected light	Intensity
novocaine	mercury vapor lamp	violet	20
β-naphthol		violet	19
benzidine		violet	16
sodium salicylate	ditto	pale blue	15
aniline	ditto	pale violet	12
antipyrin	ditto	pale violet	10
resorcinol	ditto	red	8

FLUORESCENCE OF SOLUTIONS

Substance	Exciting light	Reflected light
anthracene in alcohol	white	blue
eosin in water	white	yellow-green
esculin in alcohol	white	blue
fluorescein in water	white	green *
naphthalene-red in alcohol	white	red
quinine sulfate in water	white	purple
resorcin blue in water	white	red
rhodamine in water	white	green

* Recognizable in a dilution of 1 part in 2 million

FLUORESCENCE OF GASES AND VAPORS

Substance	Temperature	Exciting light	Reflected light
iodine	10–30°C	mercury arc	greenish yellow
mercury	10–30°C	aluminum spark	blue
oxygen	10–30°C	mercury arc	ultra-violet
potassium	300–400°C	white light	red
rubidium	250–300°C	white light	red
sodium	300–400°C	white light	yellow

exciting radiation to a more stable position It differs from phosphorescence, q v , where the luminescence, q v , continues, even after illumination has ceased Cf *excitation, phototropy, Raman effect, scattering, Compton effect* **f analysis** The examination of substances in ultraviolet light with the object of identifying or determining them or assessing their quality or purity from the color and intensity of the f produced **f microscopy** Microscopical examination using ultraviolet instead of visible light, the structures of many objects appear fluorescent **f serology** The diagnosis of **disease** from the f of sera Cf *fluorometry*

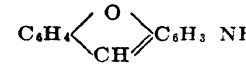
fluorescent Epipolic The property of having different colors by transmitted and reflected lights **f screen** A glass plate covered with a fluorescent substance, *e g* , a tungstate or platinocyanide Used for making visible those rays which are normally invisible to the eye **f unit** The standard luminescence produced by 1 mg radium element on 1 square centimeter of a barium platinocyanide screen See *fluorimeter*

fluorescin $C_{20}H_{14}O_5$ = 334 2 A light yellow powder, insoluble in water, soluble in alcohol or ether, used as a dye Cf *fluorescein*

fluoric acid An incorrect term for hydrofluoric acid, HF The name fluoric acid indicates the compound HFO_3, which does not exist

fluoride A salt of hydrofluoric acid containing the monovalent F— radical **acid-** A salt of the type MHF_2

fluorime $C_{13}H_9ON$ The heterocyclic system

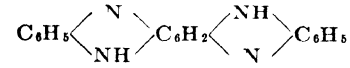


fluorimes Compounds derived from fluorime

fluorimeter An absorbing screen of varying thickness or other instruments, used for measuring the intensity of fluorescence, especially the fluorescence caused by X-rays, cathode-rays and radium See *fluorimetry*

fluorination The introduction of fluorine into an organic molecule

fluorindene $C_{16}H_{12}N_4$ = 260 3 The heterocyclic system



Substitution usually takes place on the nitrogen atoms

fluorine F = 19 00 An element, atomic number 9 A halogen and poisonous pale green gas, $d_{(air=1)}$ 1 31, m −233, b −187, d of liquid F 1 14, soluble in water, alcohol or ether Fluorine is the most negative element, and hence even more reactive than oxygen It has a valency of 1, and forms only one series of compounds, the fluorides, no oxysalts are known It was discovered in 1771 by Scheele in fluorite cryolite and other minerals, and isolated (1886) by Moissan Liquid fluorine has a bright yellow color, and solid fluorine is colorless Fluorine salts are of the types

MF or M_2F_2	normal fluorides
MHF_2	acid fluorides

proto- Coronium **f hydride** Hydrofluoric acid **f iodine** Fluoriodine **f oxide** OF_2 = 54 0 A gas less active than fluorine, having the same odor, soluble in alkali, sparingly soluble in water There also exist a brown gas, O_2F_2 = 70 0, and a colorless gas, OF = 35 0

fluorinion Fluorion

fluoriodate A compound derived from the iodates by the partial replacement of the oxygen by fluorine, as difluoriodates R IO_2F_2, in which R may be potassium, sodium, ammonium, rubidium, cesium, or pyridine

fluoriodine F_5I = 221 8 Iodine pentafluoride A colorless, heavy, fuming liquid, m −8, b 97, of great chemical reactivity, decomp by water and solvents

fluorion The monovalent fluorine ion, F^-

fluorite CaF_2 = 78 09 Fluorspar Siliceous sinter Native calcium fluoride, variously colored, brittle, d 3 18, hardness 4 Used as flux in the steel and glass industries and in the manufacture of hydrofluoric acid

fluorobenzene Fluobenzene

fluorochrome A substance capable of causing another substance with which it comes in contact to fluoresce

fluoroform CHF_3 = 70 0 Fluoform, trifluoromethane* A colorless gas, d 2 53, b $_{40atm}$ 20, slightly soluble in water, soluble in alcohol or chloroform

fluoroformol A 2 8 % solution of fluoroform in water A colorless, odorless, tasteless, nonirritant liquid Used medicinally for the treatment of tuberculosis

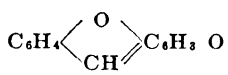
fluorogen Fluorophore

fluorometer Fluorimeter

fluoromethane CF_4 = 88 0 Fluomethane, carbon tetrafluoride A colorless gas formed as by-product in the manufacture of metallic aluminum from cryolite

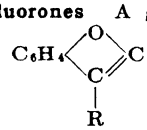
fluorometry The measurement of the color and intensity of fluorescence (q v), as, in fluorescence analysis and microscopy Cf *fluorimetry*

fluorone $C_{13}H_8O_2$ = 196 06 3-isoxanthone The heterocyclic system



An isolog of fluorine

fluorones A group of compounds of the type



O derived from fluorene

fluorophore A group of atoms which confers fluorescence on a compound, as the oxazine or pyrone ring Cf *chromophore, resonator, constellation*

fluoroscope (1) A fluorescent screen used for making visible certain rays, *e g* , X-rays, cathode rays, radioactive rays (2) An apparatus to determine the fluorescence of a solution by comparison with a standard

fluorosis Disease (and in particular mottling of the enamel of the teeth) due to an excess of fluorine ions in the system, usually derived from drinking water

fluorspar Fluorite

fluoryl The monovalent radical, $C_{13}H_9$—, derived from fluorene There are five isomers

f amine $C_{13}H_9NH_6$ = 181 09 Aminofluorene White crystals, insoluble in water

fluorylidene The bivalent radical, $C_{13}H_8$=, derived from fluorene

fluosilicate Silicofluoride A salt of the type M_2SiF_6 derived from fluosilicic acid

fluosilicic acid H_2SiF_6 = 144 3 Hydrofluosilicic acid, silicofluoric acid, hydrosilicofluoric acid A strong acid which exists only in solutions, and decomposes on concentration or heating into HF and SiH_4 It forms insoluble K and Ba salts, and is obtained by the action of SiF_4 on water

fluotitanic acid H_2TiF_6 = 163 9 Hydrofluotitanic acid A dibasic acid obtained by passing TiF_4 into water

flussigas Calorgas

flux (1) A continuous flowing or discharge See *electrical, luminous, magnetic, thermal* (2) A substance that causes other substances to melt more readily by dissolving their oxides or surface impurities, *e g* , sodium carbonate, saltpeter, zinc chloride, sodium pyroborate, lead oxide, or borax It increases the fluidity of the materials and brings them into more intimate contact **aluminum-** A mixture of the alkali chlorides and fluorides **black-** A flux and reducing agent used in metallurgy, a mixture of potassium carbonate and charcoal made by heating tartar **radiant-** The amount of radiant energy (electromagnetic radiation) that flows along a beam per unit of time **reducing-** A mixture of 50 % borax glass, 15 % boric acid, 25 % argol and 10 % animal charcoal **oxidizing-** A mixture of 30 % borax glass, 20 % boric acid, 5 % silica, 20 % $KClO_3$ and 25 % sodium perborate **soldering-** A mixture of 55 % borax glass, 35 % boric acid, 10 % silica or dry sodium silicate

f density The radiant f per unit area Cf *intensity*

fly ash The fine ash or flue-dust carried by the combustion products of pulverized coal plants

foam A heterogeneous mixture of a gaseous phase in a liquid phase, or finely-divided gas bubbles suspended in a liquid Cf *flotation, colloids*

foaming Describing a liquid which on heating or on agitation forms a surface foam

focal Pertaining to a focus

focus A point on which rays converge and produce an intensified effect **acoustic-** The meeting point of waves reflected from a concave surface **anterior-** A point before an optical system, which corresponds with the posterior focus **aplanatic-** The point from which rays pass through a lens without spherical aberration **conjugate-** The anterior and posterior foci of a lens They are mutually convertible **posterior-** A point behind an optical system corresponding with the anterior focus **principal-** The point on which parallel rays passing through a lens converge **real-** The point at which convergent rays intersect **virtual-** The point at which rays if prolonged, would intersect one another

focusing The adjustment of lenses or mirrors to produce a distinct image, *e g* , in a photographic camera, lantern or microscope

fodder Dry food for domestic animals *e g* , hay, straw, corn

fog A heterogeneous mixture of a liquid phase in a gaseous phase (see *colloid, dispersed systems*), finely-divided liquid droplets suspended in a gas

f chamber Cloud chamber A small container in which a haze is produced by sudden pressure changes Cf *Wilson tracks*

fogging (1) To cause a mist by agitating or heating a liquid in a closed container (2) In photography, a uniform haze over the plate, due to over-exposure or light leakage

foil A thin sheet of metal, *e g* , of aluminum, gold, platinum, tin

folia Latin for leaves

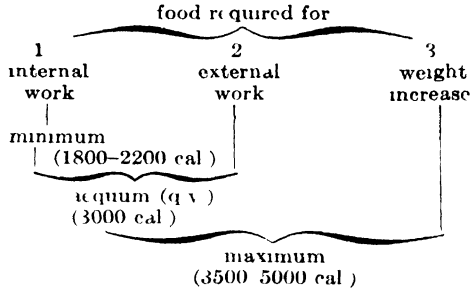
folic acid A probable B-vitamin present in green leaves and animal tissues, and important in yeast nutrition

Folin, Otto. 1867–1934 An American biochemist born in Sweden, noted for devising analytical methods and apparatus, particularly for the determination of uric acid and its constituents **F apparatus** A glass apparatus consisting of a specially-designed absorption tube, a cylinder with a rubber stopper, drying tube and bottle, is used for the rapid determination of nitrogen urea, or ammonia in urine or other fluids **F diet** A daily food ration consisting of 500 cc milk, 300 cc cream, 450 gm eggs, 200 gm Horlick's malted milk, 20 gm sugar, 6 gm salt, and 2100 cc water

folliculin Oestrone

fongisterol $C_{28}H_{40}O\ H_2O$ = 382 39 Fungisterol A sterol (q v), m 144, from ergot

food A substance which serves to build up tissues, repair waste, and supply living organisms with heat The essential constituents are Water, carbohydrates (starch, glucose, etc), fats, proteins (albumins, etc), salts vitamins The food essential for the human body is expressed as follows



The approximate daily quantity for a person of 70 kg body weight is

120 gm proteins	(430 calories)
500 gm carbohydrates	(2000 calories)
50 gm fat	(450 calories)

with a daily mineral requirement of

10 gm	NaCl	0 35 gm	Mg
3 gm	K	0 015 gm	I
1 50 gm	Mn	0 010 gm	Fe
1 30 gm	P	0 002 gm	Cu
0 7 gm	Ca	traces of	Zn Al, Si F

in addition, vitamins, q v

A	200 Int Units	(0 004 gm haliver oil)
B	200 Int Units	(20 gm dried yeast)
C	400 Int Units	(40 cc lemon juice)
D	1100 Int Units	(0 1 gm haliver oil)
G	450 Sherman Units	(30 gm dried yeast)
E	doubtful	

See also *f sources*

animal- A nourishing material derived from animals, as, meats, fish, milk, eggs, cod liver oil, etc **flesh-forming-** The proteins and salts necessary as tissue builders **heat-forming-** The carbohydrates and fats which supply the body-heat **iron-** F containing iron The iron percentage varies from 0 01921 % (parsley) to 0 00015 % (lemon) **nitrogenous-** The proteins, lecithins, and other foods containing nitrogen **non-nitrogenous-** The carbohydrates and salts **protective-** F which supply calcium, vitamin A, C, and G (milk, cheese, and green vegetables), in which common diets are often deficient **staple-** F which are most frequently used, as, bread, bacon, rice, etc **vegetable-** Nourishing materials derived from plants, *e g* , cereals or seeds, nuts, vegetables, fruits, sugars

f and drug act A legislative measure in force in the U S A since Jan 1, 1907 and in Great Britain since 1860, prohibiting the manufacture, sale, or transportation of adulterated, misbranded, poisonous, or deleterious foods, drugs, medicines, or liquors **f hormones** Vitamins **f poisons** Toxic substances developed by decomposition of foods, especially ptomaines and other protein split-products **f sources**

1 CEREALS—the seeds of Gramineae, rich in carbohydrates

Avena sativa	oats
Fagopyrum esculentum	buckwheat
Hordeum vulgare	barley
Oryza sativa	rice
Panicum miliaceum	millet
Secale cereale	rye
Triticum sativum	wheat
Zea Mays	maize, corn

2 PULSES—the seeds of Leguminosae, rich in proteins

Arachis hypogaea	peanut
Cajanus indicus	cowpea
Glycine species	soya bean
Lathyrus species	peas
Lens esculenta	lentils
Phaseolus vulgaris	kidney beans
Phaseolus lunatus	Lima beans
Pisum sativum	peas
Vicia faba	broad beans

3 NUTS—the oily seeds of various plants, rich in fats

Bertholletia excelsa	brazilnut
Carya species	pecan
Castanea vulgaris	chestnut
Cocos nucifera	coconut
Corylus Avellana	hazelnut
Juglans regia	walnut
Juglans cinerea	butternut
Pistacia vera	pistachio

4 ROOTS and TUBERS—the underground reserves of certain plants, generally rich in carbohydrates

Allium cepa	onion
Beta vulgaris	beets
Brassica campestris	turnips
Colocasia antiquorum	taro
Daucus carrota	carrots
Dioscorea species	yam
Helianthus tuberosus	Jerusalem artichoke
Ipomoea batatas	sweet potato
Manihot utilissima	cassava
Maranta arundinacea	arrowroot
Peucedanum sativum	parsnip
Raphanus sativus	radish
Solanum tuberosum	potato

5 GREEN VEGETABLES—the leaves, inflorescences, stems and young shoots of certain plants, generally containing vitamins and salts

Allium sativum	garlic
Apium graveolens	celery
Asparagus officinalis	asparagus
Bambusa species	bamboo sprouts
Brassica oleracea	cabbage, cauliflower
Cynara scolymus	artichoke
Lactuca sativa	lettuce

Lepidium sativum	cress
Rheum Rhaponticum	rhubarb
Spinacia oleracea	spinach

6 FRUITS used as VEGETABLES—the fleshy fruits of various plants

Artocarpus incisa	breadfruit
Cucumis sativus	cucumber
Cucurbita Pepo	squash, pumpkin
Solanum lycopersicum	tomato
Solanum melongena	eggplant

7 FRUITS and BERRIES, generally containing acids, sugars and salts,

Ananas sativus	pineapple
Citrus species	orange, lemon
Cucumis melo	melon
Ficus carica	fig
Fragaria vesca	strawberry
Magnifera indica	mango
Musa sapientum	banana
Phoenix dactilyfera	date
Prunus species	apricot, cherry, peach, plum, prune, nectarine
Psidium guajava	guava
Punica granatum	pomegranate
Pyrus species	apple, pear
Ribes species	black and red currant, gooseberry
Rubus species	blackberry, loganberry, raspberry, thimbleberry
Vaccinium species	cranberry, bilberry, blue huckleberry
Vitis vinifera	grapes

8 MEAT and FISH, rich in proteins
Beef, Veal, Mutton, Pork
Chicken, Goose, Turkey
Mackerel, Salmon, Tuna, Herring

9 DAIRY PRODUCTS, rich in calcium and vitamins
Milk, Cream, Buttermilk
Eggs
Butter, Cheese

10 MISCELLANEOUS
Mushrooms and Yeast
Honey, Sugar, Maple syrup
Sago, Tapioca
Spices and Condiments

foot A unit of length, 1 foot = 12 inches = 0 304801 meter **board-** q v **square-** Sq ft or ft^2 A measure of area 1 ft^2 = 144 in^2 = 0 092903 m^2 = 929 03 cm^2 **cubic-** Cb ft or ft^3 A measure of volume 1 ft^3 = 1728 in^3 = 0 02832 m^3 = 2832 cm^3

foot-candle A measure of illumination 1 ft candle = 1 lumen per ft^2 = the illumination given by a standard candle upon a surface of 1 sq ft one foot distant 1 ft candle = 1 076 milliphots = 10 76 lux Cf *meter candle*

foot-pound A unit of work in the F P S system, the work required to lift one pound one foot, where g = 32 2 ft /sec^2 1 ft pd = 0 1383 kg m = 1 356 joules = 0 3240 calories = 0 001285 British thermal units = $0\ 3766 \times 10^{-6}$ kilowatt hours 1 horse power = 33,000 ft pds of work/min **f p second** F P S system A system of measurements based upon the foot, pound, and second Cf *c g s*, *system*, *M K H system*

foot-poundal A unit of force in the F P S system, the force which during one second will accelerate a mass of one pound one foot per second = poundal

foot-powder A mixture of fine salicylic acid and French chalk, used as an antiseptic dusting powder

foots The sediment which settles from an oil on standing It is chiefly albuminous matter

forbesite A rare nickel-cobalt arsenate

forbidden explosives A group of unstable chemicals and mixtures which may not normally be transported or shipped, and which are condemned by the U S Bureau of Explosives They include liquid nitroglycerin, dynamite containing over 60 % nitroglycerin, nitrocellulose dry and uncompressed in quantity greater than 10 pounds, and dry mercury fulminate **f lines** Spectrum lines corresponding with atomic transitions not in harmony with Pauli's principle

force The rate of change of momentum The interaction between two bodies whereby their state of rest or motion, or their form or size is changed Cf *attraction*, *repulsion*, *acceleration*, *electromotive force*, *energy*, *action* The unit of force is the dyne (C G S system) or poundal (F P S system) Force = (Mass × Velocity) / Time = Mass × (Velocity / Time) = Mass × Acceleration Suggested classification of forces (P E Wells)

1 *Electronic*, which bind electrons together into atoms
2 *Atomic*, which bind atoms together into molecules
3 *Molecular*, which bind molecules together into masses
4 *Molar*, which affect masses, as, gravitation

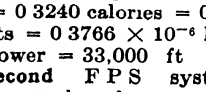
catabiotic- The heat energy derived by a living organism from food **catalytic-** The chemical work performed by a catalyst **centrifugal-** See *centrifugal* **chemical-** See *affinity* **cohesive-** See *cohesion* **electromotive-** See *electromotive force* **kinetic-** See *kinetic energy* **latent-** See *latent energy* **living-** See *vital force* **vital-** The energy obtainable from a living organism or cell

forceps A small V-shaped instrument for grasping, pulling or holding objects such as analytical weights Cf *tongs*

forensic Pertaining to courts of law **f analysis.** Chemical analysis performed for the purpose of detecting crime, especially the examination of body-fluids and tissues for poisons **f chemistry** Legal chemistry, judicial chemistry The application of c for purposes of law, e g detection of crime, misbranding and adulteration **f medicine** See *medicine*

forgenin $C_5H_{13}O_2N$ = 119 1 Tetramethylammonium formate $HCOONMe_4$ Colorless hygroscopic crystals, used medicinally In small doses it stimulates, in large doses it acts like curare

forked chain A chain of carbon atoms linked together with two smaller chains,



as, —C—C—C(—C)—C— Cf *branched chain*

formal (1) $C_3H_8O_2$ = 60 1 Methylal, dimethoxymethane*, methylene dimethylate, methyl aldehyde, formyl aldehyde, oxymethylene, methylene dimethyl ether $CH_2(OMe)_2$ A colorless liquid, used medicinally as an anesthetic and hypnotic (2) Containing one gram-molecular weight in 1 liter, cf *molar* (in 1000 cc), and *molal* (in 1000 gm)

formaldehyde CH_2O = 30 03 Formic aldehyde, methanal*, methylene oxide The simplest aldehyde H CHO, derived from methanol

A colorless gas, m −92, b −21, soluble in water, alcohol or ether, marketed as an aqueous solution f **solution** A 37 % aqueous solution of formaldehyde A clear colorless liquid with a characteristic odor Used extensively as a reagent, preservative, (not for foods), embalming agent, antiseptic, and deodorant, industrially in large quantities in the synthesis of many substances, and in for the formation of plastic, *e g* , bakelite

formalin A 27 % (U S) or 40 % (British) formaldehyde solution

formaldoxime CH_3ON = 45 1 The simplest oxime, H_2C NOH A colorless liquid, b 84

formaloin CH_2 $C_{17}H_{16}O_7$ A condensation product of formaldehyde and aloin A yellow, amorphous, tasteless powder, soluble in water, used medicinally

formamide CH_3ON = 45 1 Formic acid amide, formyl amine, methanamide*, H CO - NH_2 A colorless hygroscopic liquid, d 1 337, m 4, b $_{10mm}$ 105–106, soluble in water, alcohol, or ether, decomp into NH_3 and CO by heating **ethyl-** C_3H_7ON = 73 1 A colorless liquid, b 199 **allyl-** C_4H_7ON = 85 1 A colorless liquid, b 109 **phenyl-** Formanilide

formamides A compound containing the monovalent HCONH— radical

formamidine A compound containing the bivalent —N CH NH— radical **diphenyl-** $C_{13}H_{12}N_2$ = 196 2 Methenyldiphenyldiamine PhN CH NHPh Colorless crystals, m 135 **o-phenylene-** Benzimidazole

formamido (1) The monovalent radical, H CO - NH—, derived from formamide (2) CH_4N_2 = 44 05 HN CH NH_2

formamine Hexamethylenetetramine

formamyl Amide group The —$CONH_2$ radical, the presence of which confers weakly basic properties

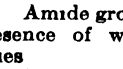
Formanek's indicator Alizarin green, dihydroxydinaphthazoxonium sulfonate A green oxazine dye, used as an indicator pH 0 3 = violet, pH 1 0 = pink, pH 12 0 = yellow, pH 14 0 = brown

formanilide C_7H_7ON = 121 14 Phenylformamide, formylaniline, formamidobenzene, carbanil aldehyde Colorless or slightly yellow prisms, d 1 144, m 50, b 271, soluble in water, alcohol, glycerin or oils, used medicinally as an antiseptic **thio-** Thioformanilide

formate Formiate A compound containing the monovalent H COO— radical, *i e* , a salt of formic acid

formation (1) The process of being made (2) A geologic era, q v **heat of-** See *heat*

formazyl (1) $C_{13}H_{12}N_4$ = 224 2 Formazylhydride Ph N N CH N NH Ph Colorless crystals, m 116 (2) The monovalent radical



f **carboxylic acid.** $C_{14}H_{12}O_2N_4$ = 268 4 PhN N C(COOH) N NHPh Colorless crystals, m 162 f **hydride** Formazyl f **methylketone** $C_{15}H_{14}ON_4$ = 266 4 PhN N C(COMe) N NHPh Colorless crystals, m 134

formhydroxamic acid The theoretical compound H CO NH OH

formiate Formate

formic acid CH_2O_2 = 46 03 Formylic acid, methanoic acid*, aminic acid, methane acid A monobasic acid, the first member of the aliphatic series, HCOOH A colorless liquid, $d_{20°}$ 1 218, m 8 6, b 100 8, miscible with water, alcohol, or ether It is contained in the bodies of ants, spiders, and various plants, used as a reagent for detecting nitrates in water and in the analysis of essential oils **acetyl-** Pyruvic acid **amidobenzoyl-** Isatic acid **amino-** Carbamic acid **benzoyl-** Benzoylformic acid **carbamyl-** Oxamic acid **carbobenzoyl-** Phthalonic acid **formyl-** Glyoxylic acid **hydrazino-** Carbazic acid **hydrazobis-** Bicarbamic acid **hydroxy-** Carbonic acid **formyl-** Glyoxylic acid **phenyl-** Benzoic acid **styryl-** Cinnamic acid f **aldehyde** Formaldehyde f **nitrile.** Hydrocyanic acid

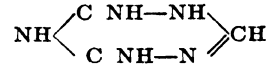
formin The glycerol esters of formic acid

monoformin	$C_3H_5(OH)_2OOCH$
diformin	$C_3H_5(OH)(OOCH)_2$
triformin	$C_3H_5(OOCH)_3$

bromoethyl- Bromalin

formine Hexamethyleneamine f **salicylate.** Saliformin

formoguanine $C_3H_5N_5$ = 111 1 Diamidocyanidine



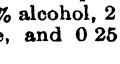
formohydrazide* Formyl hydrazine

formol A commercial antiseptic consisting of a solution of formaldehyde in methanol and water f **nitrogen** That part of nitrogen in the protein molecule which combines with formaldehyde, *e g* , the nitrogen of unsubstituted amino groups f **titration.** A method for the determination of aminoacids by titration with an alkali, after formaldehyde has been added to annul the alkalinity of the amino group

formolide A commercial antiseptic, an aqueous solution containing 15 % alcohol, 2 % boric acid, 0 5 % sodium benzoate, and 0 25 % formaldehyde

formonitrile Hydrocyanic acid

formonitrolic acid CH_2O_3N = 90 03 Methylnitrolic acid, nitroformoxime



Colorless crystals, m 64, very soluble in water, alcohol or ether Cf *nitrolic acid*

formose l-Fructose

formosul Rongalite (q v), a condensation product of formaldehyde and phenols

formoxime CH_3NO = 45 03 Formaldoxime, formaldehyde oxime, HCH NOH A colorless liquid, b 84, decomp in hot water **nitro-** Formonitrolic acid

formoxyl *Formyl* f **hydride** Formic acid

formoyl Methanoyl The H COO— group

formula A combination of chemical symbols expressing the composition of a molecule All formulae indicate (a) the kind of elements and the number of atoms which constitute the molecule, (b) the weight relations of these elements and the molecular weight of the compound, (c) the percentage by weight of the elements composing the molecule, (d) the valency of the elements In addition formulae for gases or vapors indicate (e) the volume relation of gaseous constituents, (f) the specific gravity or density of the gas or vapor, (g) the weight of one liter gas or vapor, (h) the volume occupied by one gram of gas or vapor Thus, chemical formula H_2O means (a) a molecule of water consists of two atoms of hydrogen

and one atom of oxygen, making three atoms in the molecule, (b) the molecular weight is the sum of the atomic weights, hence 2 × 1 0 + 16 0 = 18 0 (c) The percentage composition by weight is calculated from (b), thus in 18 parts by weight water are 2 parts hydrogen, hence 18 2 100 x, or (2 × 100)/18 = 11 11 % hydrogen by weight, and in 18 parts water are 16 parts oxygen, hence 18 16 100 x, or (16 × 100) /18 = 88 89 % oxygen by weight (d) The valence of hydrogen is +1, hence two atoms, or +2 are the equivalent of oxygen, whose valency is −2 (e) Two volumes hydrogen and one volume oxygen combine to give two volumes water (vapor) (f) The density of water vapor is (1) compared with oxygen, the molecular weight, hence—$D_{(O_2=32)}$ = 18 00, (2) compared with hydrogen, one-half of the molecular weight, hence—$D_{(H_2=1)}$ = 9 00, (3) compared with air the molecular weight divided by 28 95, hence—$D_{(air=1)}$ = 0 622 Water vapor is thus about half as heavy as oxygen gas or air and nine times heavier than hydrogen (g) A gram-molecule of any gas or vapor occupies 22 4 liters, hence 22 4 liters water vapor weigh 18 grams, and 1 liter weighs 18/22 4 = 0 803 grams (h) As 18 grams of water vapor occupy 22 4 liters, then 1 gram will occupy 22 4/18 = 1 245 liters

FORMULA SIGNS

. = Periods are used to separate radicals (CH_3COOH), the constituents of a double salt ($KCl\ PtCl_3$), or the water of crystallization ($CuCl_2\ 6H_2O$)

, = Commas are used in a formula to indicate elements which are interchangeable $(Ni,Fe)AsS$ means FeAsS and NiAsS in variable proportion, or to separate water of crystallization *e g* , $FeSO_4,\ 7H_2O$

( ) = Parentheses are used to group elements together, or to indicate radicals, *e g* $(NH_4)_2SO_4$ or $Cu_2(SO_4)_3$

\+ = Plus-signs or upper dots indicate a positive charge or cation, K^+ or NH_4^-

′ − = Minus-signs (vertical or horizontal) indicate a negative charge or anion, Cl^- or SO_4''

→ = Arrows indicate direction of the reaction

⇋ or ⇌ = Indicate equilibrium or a tendency to react

* = asterisk indicates (a) an excited atom or molecule, as, Cl* or Cl_2*, or (b) a name recommended by the International Union of Chemistry

[ ] = Square brackets are used in addition to parentheses, *e g* $Fe_4[Fe(CN)_6]_3$ to indicate radicals, or in coordination formulae, to show the relationship to the central atom

1, 2, = *Numeral behind* the symbol or parenthesis is a multiplier for the preceding symbol, *numeral before* a formula is a multiplier of the whole formula Thus $2Al_2(SO_4)_3\ 6H_2O$ means two molecules of crystalline aluminum sulfate each containing 6 molecules of water of crystallization

$A^{1\,2\,3}$ = *Small upper numerals* behind the symbol of an element indicate the isotopic weight

$_{1\,2\,3}A$ = *Small lower numerals* before the symbol of an element indicate the atomic number, thus, $_1H^2$, $_3Li^6$ etc

M, X = Letters such as M or X indicate a metal or halogen For other abbreviations (not symbols), see *radicals*

— or = or ≡ or or or = Lines or dots either single, double, or triple, indicate valence bonds in a structural formula

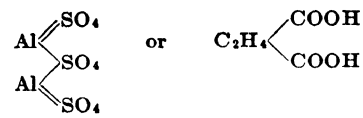
: = Dots which indicate electron pairs, in the octet formula

—o— = Lines and circles to indicate the position of shared electron pairs in the polarity formula

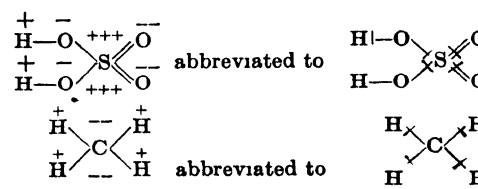
abbreviated- An abbreviation of radicals, thus Am for ammonium, Ac for acetyl, Bz for benzyl, Cy for cyanide, Et for ethyl, Me for methyl, Ph for phenyl **atomic-Structural- Beckmann's-** See *Beckmann's reaction* **coordinate-** An expression indicating the relation of complex compounds to a central atom, thus

$$\begin{bmatrix} NH_3 & & NH_3 \\ NH_3 & Co & NH_3 \\ NH_3. & & Cl \end{bmatrix} Cl_2$$

shows that two of the chloride atoms are less firmly held by the cobalt atom, and can readily be separated from it **constitutional-** A notation indicating constitution by valence bonds or the linkage between radicals and atoms, it does not indicate the linkage of each individual atom



dynamic- See *benzene ring* (figs k′ and k″) **electronic-** A notation that indicates the electropositive or electronegative character of an atom in a compound, as



empirical- A notation showing the number and kind of atoms without indicating their grouping

$Al_2S_3O_{12}$ or $C_4H_6O_4$

excitation- See *excitation* **general-** An algebraic expression representing the formula of a series of compounds, thus, $M_2X(SO_4)_2\ 12H_2O$ is the general equation for the alums, in which M may be any monovalent metal, and X any trivalent metal C_nH_{2n-2} is the general equation for the methane series **graphic-** Diagrammatic A f showing space relations, as, a tetrahedron

for carbon Cf *structure, symbol* **ionic-** The symbol for an electrically charged atom or radical, as Na^+ or NH_4^- **molecular-** A formula for a complex compound indicating the participating molecules, thus NH_3 HCl is the molecular equation for NH_4Cl **octet-** A f showing the number of electrons, as

H
H C H or H O H
H

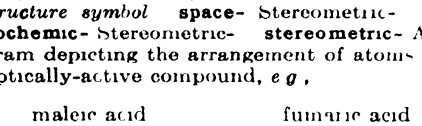
Cf *Lewis-Langmuir theory* **polar-** Octet- **polarity-** A f which indicates the relative position of the electron pairs held in common between two atoms

C—o— C and C—o— O

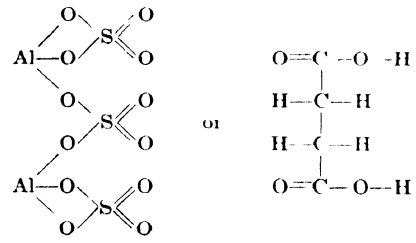
or

C— —C and C— —O

rational- A formula indicating by the use of radicals the intra-atomic arrangement thus $Al_2(SO_4)_3$ or $C_2H_4(COOH)_2$ **shorthand-** See *structure symbol* **space-** Stereometric- **stereochemic-** Stereometric- **stereometric-** A diagram depicting the arrangement of atoms in an optically-active compound, *e g*,



structural- A notation indicating the spatial structure of a compound and the linkage of every atom thus



Cf *molecular diagram* **symbolic-** Structure symbol **transmutation-** See *equation*

formula-symbol Structure symbol

formula-weight The molecular weight expressed in grams,—one mol

formulary A collection of recipes and prescriptions Cf *dispensatory*

formvar Trade name for a polyvinyl formaldehyde plastic

formyl (1) The monovalent HCO— radical, derived from formaldehyde or formic acid (2) An obsolete term for methenyl, HC≡ **f acetic acid** $C_3H_4O_3$ = 88 0 CHO CH_2 COOH **f aldehyde** Formaldehyde **f amide** Formamide **f bromide** Bromoform **f chloride** Chloroform **f diphenylamine** $C_{13}H_{11}ON$ = 197 2 Colorless crystals, m 73, insoluble in water, soluble in alcohol **f hydrazine** CH_4ON_2 = 60 1 Formohydrazide* NH_2 NH CHO Colorless crystals, m 54, soluble in alcohol *di-*$C_2H_4O_2N_2$ = 88 1 Colorless crystals, m 106, soluble in alcohol **f sulfaldehyde** $C_3H_6S_3$ = 138 2 CH_2SH - CH_2 CSSH Colorless, tetragonal prisms, m - 218, sparingly soluble in water, slightly soluble in alcohol or ether **f trichloride** Chloroform **f triiodide** Iodoform

formylation The introduction of the formyl radical into an organic compound

formylene Methenyl

formylic acid Formic acid

forsterite Mg_2SiO_4 A white orthorhombic magnesium silicate of the olivine group, containing iron oxide, d 3 2–3 3, hardness 7

fortified Strengthened **f wine** (1) Wine to which a fermentable sugar has been added (2) Wine to which alcohol or wine brandy has been added

fortoin $CH_2(C_{14}H_{11}O_4)_2$ = 500 3 Methylene dicotoin Yellow needles or powder of faint cinnamon-like odor, m 211 insoluble in water, soluble in alcohol, ether, acetone, or chloroform Used medicinally as an antiseptic and astringent

fossil Traces or remains of prehistoric organisms imprinted or entombed in geological formations

fossil copal See *copals*

fossilin Vaselin

Foster tester An apparatus for determining the flash point of illuminating oils

foto- Photo-

fotosensin A condensation product of phthalic acid and resorcinol, with small amounts of Cu and Fe, used to sensitize plant growth

fouadin Fuadin

Foucault Jean Bernard Léon 1819–1868 \ French physicist **F current** Eddy current **F pendulum** A Galileo pendulum **F prism** A polarizing prism using a thin film of air for reflection Cf *Nicol prism*

Fourneau 309 A complex urea compound, used as a cure for sleeping sickness

Fowler solution An aromatic solution of potassium arsenite (1 % arsenic trioxide), used medicinally as an antiseptic, and technically in the preservation of furs

fowlerite $(Mn,Fe,Ca,Zn,Mg)SiO_3$ A red, brownish or yellowish triclinic iron-manganese silicate, d 3 4–3 7, hardness 5–6 5

Fowler's series The lines of the helium spectrum $1/\lambda = 4N\left(\frac{1}{3^2} - \frac{1}{n_2^2}\right)$ where n is 4, 5 6, λ the wavelength and N a constant

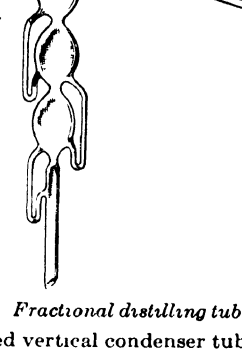
foxglove See *digitalis*

foyaite A nepheline syenite found in Portugal

F P S Abbreviation for foot-pound system, q v

fraction A part or separated portion of a whole

fractional Pertaining to separated parts **f column** Dephlegmator Same as f distilling tubes **f combustion** A method of separating gas mixtures by removing one constituent by combustion **f condensation** A method of separating gases in a mixture by lowering the temperature or increasing the pressure until one of the gases liquefies **f. condensing tube** An air-cooled vertical condenser tube



Fractional distilling tube

of varied shape used in fractional distillation to promote condensation. **f. crystallization.** A method for separating or purifying compounds in solution by successive slow crystallizations, the mother liquor being removed for further crystallization. **f. distillation.** A method of separating volatile substances by collecting separately the distillates evaporating at certain temperatures. **f. distilling tube.** A group of variously shaped glass tubes which are used for collecting the distillates at different temperatures separately (see figure.) **f. expression.** The collection of plant oils or juices expressed at different temperatures, *e.g.*, peanut oil. Usually the lower the temperature, the better the grade of oil. **f. filtration.** The filtration of solutions consecutively through coarse, medium, and fine filters. **f. precipitation.** Salting out. **f. weights.** The analytical weights less than one gram.

fractionating. Separating into parts. **f. column.** Dephlegmator. A device for fractional distillation. Cf. *still head.*

fractionation. Fractional distillation.

fracture. A sharp edge produced on breaking a solid substance. Cf. *cleavage.* **conchoidal-** The irregular fracture of an amorphous body. **crystalline-** A fracture producing the plane faces and sharp edges of a crystal, *i.e.*, cleavage.

fragility. Brittleness. The characteristics of falling or breaking apart; not tenacious.

fragment. A detached or broken-off part.

fragrance. A pleasant odor.

francisceine. An alkaloid from the root of *Franciscea uniflora*, Brazilian manaca, a Solanaceae; used as a diuretic and purgative.

franckeite. $Pb_5FeSn_3Sb_2S_{14}$. A rare tin-lead sulfostibide.

francolite. A calcium phosphite containing calcium carbonate.

frangula. Buckthorn bark, arrow-wood. The dried bark of *Rhamnus frangula*, a Rhamnaceae; used medicinally as a laxative. **f. emodin.** Emodin.

frangularoside. A rhamnoside from the freshly-dried bark of black alder.

frangulic acid. A dihydroxyanthraquinone derived from frangula.

frangulin. $C_{20}H_{20}O_9$ = 404.15. A glucoside from the bark of *Rhamnus frangula.* Yellow crystals, m.226, insoluble in water, soluble in hot alcohol or ether.

Frangulineae. Rhamnales. A group of plants comprising the Rhamnaceae (buckthorn) and Vitaceae (grape) families.

frangulinic acid. Frangulic acid.

frankincense. Olibanum. **American-** An oleoresin from the bark of *Pinus palustris*, the common pine. Cf. *colophony.*

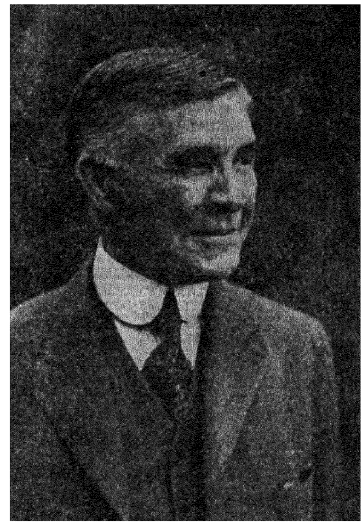
Frank, Adolf. 1834–1916. A German industrial chemist and developer of the potash industry.

Frankland, Sir Edward. 1825–1899. A British chemist noted for research on organo-metallic compounds, valency, water-supply, the theory of flames; and a co-worker of Lockyer in the discovery of helium in the sun. **F. notation.** The grouping together of radicals in a formula, and the assumption that certain salts are addition compounds, thus SO_2Ho_2 for H_2SO_4; SO_2Nao_2 for Na_2SO_4; $SO_2Ho_2Zno.6OH$ for $ZnSO_4.7H_2O$; in which Ho is hydroxyl, Nao "sodoxyl," and Zno "zincoxyl." **F. reaction.** The synthesis of hydrocarbons by the zinc-alkyl condensation:

$$Zn(CH_3)_2 + 2R.Br = 2R.CH_3 + ZnBr_2$$

Franklin, Benjamin. 1706–1790. An American statesman and scientist, noted as founder of the American Philosophical Society; for electrical experiments; and the use of fertilizers.

Franklin, Edward Curtis. 1862–1937. An American chemist noted for his theory of the ammonia system (q.v.) of compounds.



Edward Curtis Franklin.

franklinic. Static. Cf. *franklinizations.*

franklinite. $(Fe,Zn,Mn)Fe_2O_4$. A black or blue, brittle, isometric, spinel, d.5–5.1, hardness 6.1–6, 5; used as an iron ore and source of zinc.

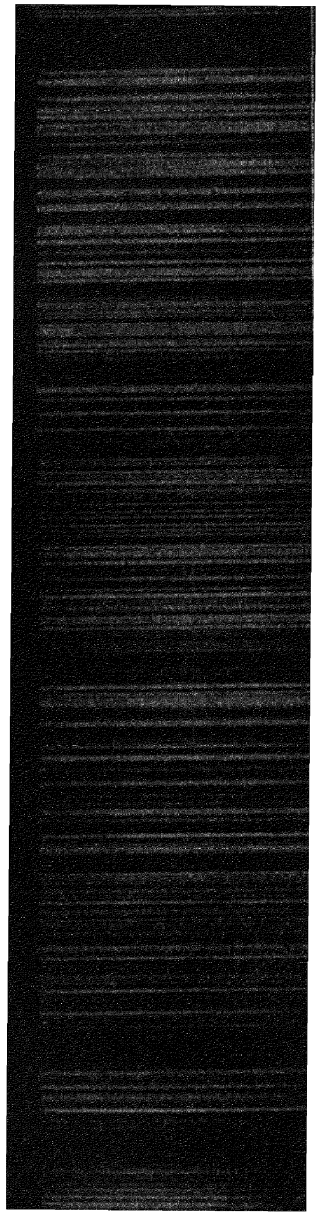
franklinization. The therapeutic application of static electricity.

Frary's metal. An alloy of lead with small amounts of barium and calcium. It is made by electrolytic deposition of Ca and Ba in molten lead, and is as hard as Pb-Sb alloys. Used during World War I for shrapnel bullets.

fraserin. The combined principles from the root of *Frasera walteri*, American calumba; used medicinally as a tonic and stimulant.

Fråude reagent. Perchloric acid.

Fraunhofer, Joseph von. 1787–1826. A German physicist noted for developing optical lenses, prisms, and diffraction gratings. He mapped the dark lines of the sun spectrum and measured the wavelength of sodium light (D-line). **F. lines.** The dark lines in the spectrum of the sun and other stars. They are produced by the absorption of certain rays of the photosphere by the incandescent gases of the solar atmosphere. Some 20,000 of them have been measured in the sun spectrum, and more than 5000 have been identified with chemical elements. A study of F. lines and the corresponding bright emission lines gives an indication of stellar conditions; as, composition, motion, temperature, magnitude and mass.



It should be noted that Fraunhofer lines H and K are due to calcium. Spectrum lines H_α, β etc. are due to hydrogen.

The principal F lines (and the corresponding bright emission lines) are shown in the table.

WAVE LENGTHS OF FRAUNHOFER LINES

Line	Wave length in Ångström units	Line due to	Color
A′	7621.28	oxygen of earth atmosphere	crimson
A″	7594.06		crimson
a	7164.72		red
B	6870.18	oxygen	red
C or H^α	6563.04	hydrogen	red
	6278.30	oxygen	orange
D_1	5896.15	sodium	yellow
D_2	5890.18	sodium	yellow
D_3	5875.98	helium	yellow
E_1	5270.56	iron	green
	5270.43	calcium	green
E_2	5269.72	iron	green
b_1	5183.79	magnesium	green
b_2	5172.85	magnesium	green
b_3	5169.22	iron	green
	5169.07	iron	green
b_4	5167.68	iron	green
	5167.50	magnesium	green
F or $H\beta$	4861.53	hydrogen	bluish green
d	4383.72	iron	blue
G′ or H_γ	4340.63	hydrogen	blue
f	4325.94	iron	blue
G	4308.08	iron	indigo
	4307.91	calcium	indigo
g	4226.90	calcium	indigo
h or H_δ	4101.80	hydrogen	purple
H	3968.62	calcium	purple
K	3933.82	calcium	purple
K	3933.82	calcium	ultraviolet
L	3820.58	iron	ultraviolet
M	3727.78	iron	ultraviolet
N	3591.35	iron	ultraviolet
O	3443.15	iron	ultraviolet
P	3361.33	iron	ultraviolet
Q	3286.89	iron	ultraviolet
R	3181.39	calcium	ultraviolet
	3179.45	calcium	ultraviolet
	3100.78	iron	ultraviolet
	3100.43	iron	ultraviolet
S	3100.04	iron	ultraviolet
s	3047.72	iron	ultraviolet
T	3020.76	iron	ultraviolet
t	2994.53	iron	ultraviolet
U	2947.99	iron	ultraviolet

axetin. $C_{10}H_9O_5$ = 208.06. A crystalline split product of fraxin, m.227.

axin. $C_{16}H_{18}O_{10}$ = 370.14. A glucoside from the bark of *Fraxinus* and *Aesculus* species, m.190. Colorless needles, soluble in hot water or alcohol.

axinine. $C_{42}H_{56}O_{27}$ = 972.3. A bitter, crystalline principle from the bark of *Fraxinus excelsior*.

axinus. A genus of trees including ash. Cf. *manna*.

fraxitannic acid. $C_{28}H_{32}O_{14}$(?). A tannin from the leaves of the ash, *Fraxinus excelsior*. A brown powder, soluble in water.

free. Uncombined, unattached, or available. **f. acid.** (1) See degree of *acidity*. (2) The HCl of the stomach juices. **f. charge.** An electric charge on a body; *e.g.*, free electrons attached to an atom or molecule and not a part of its structure. **f. electron.** An electron which takes no part in the chemical constitution of matter, but is free to move from one kind of matter to another, as in a galvanic current. **f. energy.** That portion, F, of the total energy which can be utilized for work. F = (H − TS), where H is the heat content (the internal energy +

pressure × volume), T the absolute temperature of the system, and S the entropy **f path** The average distance traveled by an electron, ion, or molecule before colliding with another atom, ion, or molecule See *ionization, electrons, radioactive bombardment, ionic mobility, kinetic theory (molecular-)* The average distance travelled by a molecule of a gas or by an ion in solution between collisions **f radical** An organic compound in which all the valencies are not satisfied, hence, an unsaturated molecule, as,

$$2Ph_3C \rightleftharpoons Ph_3C—CPh_3$$

triphenylmethyl from hexaphenylethane,

$$2Ph_2N \rightleftharpoons Ph_2N—NPh_2$$

diphenylnitrogen from tetraphenylhydrazine, in a strict sense also

$$2NO_2 \rightleftharpoons N_2O_4$$

nitrogen peroxide from nitrogen tetroxide

f valence An unsatisfied bond

freedom Variance In the phase rule P + F = C + 2, where P is the number of phases, C the number of component substances reacting, F, the degree of freedom, an integer which indicates the least number of variable factors (pressure, temperature or volume) which must be arbitrarily fixed in order to define the state of equilibrium of a chemical system The one-component system (solid-liquid-gas) is invariant, *i e*, has no degree of freedom A one-component (liquid-gas) system is univariant (F = 1), while a one component gas system is bivariant, or has two degrees of freedom

freeness The extent to which a pulp for the manufacture of paper has not been hydrated by beating Antonym—*wetness*

freeze (1) To lower the temperature until a liquid solidifies (2) The interlocking of accurately machined and polished steel parts of machinery, it is avoided by chromium plating one part

freezing The solidification of a liquid or solution by lowering its temperature **f attachment** A device attached to microtomes for freezing tissues by means of liquid or solid carbon dioxide **f mixture** Frigorific mixtures A mixture of substances that absorbs heat and thus lowers the temperature of themselves or of their immediate surroundings Used in analytical and synthetic chemistry for reactions at a low temperature *E g*,

1 pt NH_4NO_3, 1 pt Na_2CO_3 and 1 pt of water	= 10 to −26°C
5 pts NH_4Cl and 10 parts powdered ice or snow	= −5 to −18°C
5 pts NaCl, 5 pts NH_4NO_3 and 12 pts ice or snow	= −15 to −25°C
3 pts $CaCl_2$ and 1 pt ice or snow	= −40 to −70°C
10 pts dilute H_2SO_4 and 8 pts ice or snow	= −65 to −90°C
solid CO_2 and ether or chloroform	= −77°C

f point Congelation or solidification point The temperature at which a liquid freezes **f point apparatus** A device for the accurate determination of the freezing point of liquids or solutions It is used in physiological and physical chemistry to determine the concentration of solutions, osmotic pressure, and molecular weight See *cryoscopy, freezing-point depression* **f point depression** The phenomenon that solutions freeze at a lower temperature than the pure solvent This lowering or depression of the freezing point of dilute solutions is proportional to the concentration of the dissolved substance See *Raoult's law* A solution containing one-tenth gram molecule lowers the freezing point of water by −0 186°C , hence the molecular weight (M) can be determined Cf *additive properties* **f salt** Crude sodium chloride

freibergite $(Ag,Cu)_3Sb_2S_7$ $(Fe,Zn)_4SbS_7$ A grayish-black, silver-copper and iron-zinc sulfantimonide, d 4 85–5

freieslebenite $(Pb,Ag_2)_3Sb_4S_{11}$ A black, metallic silver-lead sulfantimonide d 2–2 5

Fremy, Edmond 1814–1894 A French chemist noted for developing the manufacture of iron and steel, sulfuric acid, saponification of fats, and artificial rubies **F salt** Potassium hydrogen fluoride

French chalk A hydrated silicate of magnesium

freon CCl_2F_2 = 121 00 Dichloro-difluoro methane, kinetic 12, F-12 A colorless, nearly odorless gas, d 1 442 (liquid), d 4 26 (gas), m −155, b −29 8, used as refrigerant and anesthetic

frequency (1) The rapidity with which an occurrence, oscillation or vibration is repeated (2) The number, ν, of complete vibrations or waves per unit time Thus $\nu = c/\lambda$, where c is the velocity of light and λ the wavelength of the ray concerned The numerical value of ν is very great, *e g* for green light it is 6×10^{14} vibrations per second **F** is related to energy (e) and mass (m) by $h\nu = e = mc^2$, and if the energy unit is 9×10^{20} ergs F = E = M **high-** A rapid alternating electric current, q v **molecular-** The molecular vibrations See *gas laws, excitation*, state of *aggregation* **radiation-** The f of the emitted radiation is proportional to the amount of energy radiated, $W_1 - W_2 = E = h\nu$, where W_1 and W_2 is the energy of the atom in the initial and final state, respectively, E the energy expressed in ergs, and h Plank's constant, q v

f curve Histogram A curve obtained by dividing a number of values obtained for a particular determination into classes differing by a standard amount, and plotting the number of samples in each class against the corresponding values The maximum gives the most correct result (*median*), and the ends of the series are the *quartiles*, 25 % of the values being in each quartile Cf *mean*

Fresenius, Karl Remigus 1818–1897 A German chemist noted for his work on analytical methods **F desiccator** A desiccator with bell-shaped cover **F nitrogen bulb** A conical flask with side-tubes having two bulbs near the base

Fresnel, Augustin Jean 1788–1827 A French physicist noted for experiments on aberration and diffraction of light

Freund acid *3 6*-Naphthylamine disulfonic acid

Freundlich, Herbert 1881–1941 A German-born chemist, noted for his work on colloid chemistry

freyalite A variety of thorite, q v

friction The resistance offered to sliding motion by rubbing **fluid-** Viscosity **internal-** The resistance to bending of metals due to their

crystalline structure **mechanical-** See *f coefficient*

friction coefficient A number (f) indicating the relation of the force (F) necessary just to move an object along a horizontal plane under pressure (N) F = fN It depends on the material of the substance, but not on the velocity or area of the surfaces in contact Cf *lubricants*

Friedel, Charles 1832–1899 A French chemist noted for his work on mineralogical and organic chemistry

Friedel-Crafts reaction The synthesis of an aromatic hydrocarbon homolog by the catalytic action of aluminum chloride

$$R + R'Cl + AlCl_3 = R R' + HCl + AlCl_3$$

as in the synthesis

$$3C_6H_6 + CHCl_3 = (C_6H_5)_3CH + 3HCl$$

or

$$C_6H_6 + CH_3Cl = C_6H_5CH_3 + HCl$$

F C condensation The condensation of hydrocarbons and halogen compounds in the presence of anhydrous aluminum chloride according to the Friedel-Crafts reaction Alkyl halides yield hydrocarbons, acyl halides, ketones, carbonyl halides, ketones and acids

friedelin $C_{30}H_{50}O$ = 426 4 A sterol (q v), obtained from cork and related to the hydrocarbon $C_{30}H_{52}$

Friedenthal cryoscope A device for determining molecular weight from the lowering of the freezing point, used in physiological work

Friedrichs condenser A condensing screw or worm surrounded by a glass or metal tube **F gas bottle** A glass cylinder with a spiral tube for washing gases

friesеite $Ag_2Fe_5S_8$ A rare silver-iron sulfide

frigid Cold

frigidity Coldness

frigorific All agent that produces coldness, or freezing **f mixture** Freezing mixture

fringe tree bark Chionanthus

fringes The dark, parallel and equidistant lines observed in the interferometer

frit (1) Enamel A complex alkaline borosilicate glass, usually containing fluorine, produced by melting a mixture such as borax, feldspar, quartz, and cryolite (2) To sinter

fritted, frittered Having been heated near its melting point **f glass** A glass powder heated sufficiently to stick together, used in filter crucibles, etc

fritting Becoming pasty and beginning to melt, as, some soft coals

Froehde reagent A solution of 5 mg molybdic acid in 1 cc hot concentrated sulfuric acid, used as a reagent for alkaloids

froth Foam **iron-** A fine, spongy variety of hematite

frother A chemical used in the flotation process to cause frothing, as, pine oil causing a thin transient foam, or cresylic acid, causing a heavy permanent foam

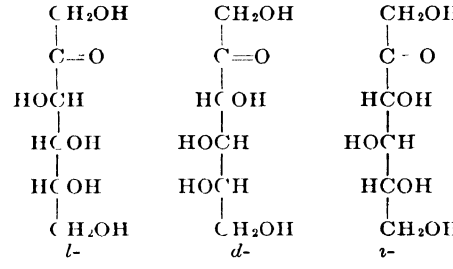
frothing Foaming **f agent** A substance which produces a froth when shaken with a liquid, as, saponin, oleic acid, lactic acid, essential oils, or phenols when shaken with water

F.R S Abbreviation for Fellow of the Royal Society

fructosamine $C_6H_{13}NO_5$ = 179 11 *a*-dextrosamine, *a*-glucosamine $CH_2OH(CHOH)_3CONH_2$ A colorless syrup, insoluble in alcohol

fructosans A group of sugar anhydrides which hydrolyse to fructose Cf *hemicellulose*

fructose $C_6H_{12}O_6$ = 180 13 Levulose, fruit sugar, l-fructose A carbohydrate in all sweet fruits and honey Colorless needles, $d_0°$ 1 555, m 94, soluble in water, alcohol, or ether Used as food for diabetics, as a preservative, etc **dextro-** d-*Fructose* **inactive-** i-Fructose, acrose, or formose An unfermentable carbohydrate which is synthesized by polymerization of formaldehyde in lime water **levo-** l-fructose, or levulose **pseudo-** Allulose



fructoside A glucoside which hydrolyses to fructose

fruit The ripened ovary of a plant together with parts of the flower that share in its development The following fruits are official (U S P) and used medicinally (see also *seeds*)

Anise	Hops
Capsicum	Lemon
Caraway	Orange
Cardamon	Pepper
Cassia fistula	Poke berries
Chenopodium	Pimenta
Colocynth	Prune
Conium	Raspberry
Coriander	Rhus glabra
Cubeb	Staranise
Fig	Tamarind
Fennel	Vanilla

fruit-essence An artificial mixture imitating the taste of a fruit, and consisting of the esters of alkyl radicals with organic acids, usually in alcoholic solution which must be highly diluted **f oil** See *oil* **apple-** A mixture containing chiefly amyl valerate **banana-** A mixture containing chiefly amyl acetate **pear-** A mixture containing chiefly amyl acetate **pineapple-** A mixture containing chiefly ethyl butyrate

fruit-sugar Fructose

ft The abbreviation for foot ft^2 = square foot ft^3 = cubic foot

fuadin Neo-antimosan, stibophen sodium antimonous biscatechol disulfate Considered to be a specific against bilharziasis

fuchsin $C_{20}H_{19}N_3HCl$ = 337 8 Magenta red, rosaniline hydrochloride, aniline red, azaleine, harmaline, rosein, erythrobenzene, rubine, solferino A red dyestuff, a mixture of the hydrochlorides of rosaniline and pararosaniline Rhombic, red crystals with greenish fluorescence, d 1 220, soluble in water or alcohol Used as dyestuff and coloring matter for inks, stains, microscopical stains, and as dye for wool, silk and cotton **acid-** A mixture of the disulfonic and trisulfonic acids of pararosaniline, used as a dye and stain **English-** A mixture of the acetates of rosaniline and pararosaniline, used as a dyestuff **German-** Fuchsin

fuchsite A variety of muscovite containing chromium

fuchsone $C_{19}H_{14}O$ = 258 1 Quinonediphenyl-**methane.** $O=C_6H_4=C(C_6H_5)_2$ An intermediate in the manufacture of rosaniline dyes

fucitol $C_6H_{14}O_5$ = 166 11 A sweet, five-atomic alcohol, m 153, from fucus

fucosan A polymer of fucose contained in the cell-walls of marine algae

fucose $C_6H_{12}O_5$ = 164 09 *2 3 4 5*-Tetrahydroxy hexanal* A colorless and crystalline methylpentose, $C_5H_9MeO_5$, obtained from fucus, m 145, soluble in water It is an isomer of rhodeose

fucosite A mineral composed of the degenerated, modified and least water-soluble portion of seaweed It contains fucose, algarose and an oil **pseudo-** Elkerite

ucoxanthin $C_{40}H_{56}O_6$ = 632 5 A carotenoid (q v) pigment of brown algae Brick red crystals, m 160

fucus Bladderwrack, seawrack The dried thallus of *Fucus vesiculosus*, a Fucaceae or seaweed, used medicinally as an alterative and resolvent

fucusamide Fucusine

fucusine $C_{15}H_{12}O_3N_2$ = 268 2 Fucusamine A crystalline alkaloid from seaweeds and fucus species

fucusoic acid β-Pyromucic acid A constituent of seaweeds

fucusol $C_5H_4O_2$ = 96 1 A colorless, oily liquid, resembling furfurol which is distilled from sea-weeds

fuel A material that furnishes heat by combustion Classification *Natural f* or *solid f* as wood, peat lignite coal, (q v) *Prepared f*, dried f , as, briquettes and compressed fuels *Liquid f*, as petroleum, gasoline *Gaseous f*, as coal or water gas **metallic-** Finely powdered magnesium or aluminum Cf *thermit* **f gases** The compressed gases used for welding and cutting metals, as, blau-gas, butane, coal-gas, Pintsch-gas, pyrogen, thermoline, prestolite **f oil** Crude petroleum

fugacity The escaping tendency of a substance in a heterogeneous mixture, by which a chemical equilibrium responds to altered conditions In a dilute solution obeying the gas laws, the f equals the osmotic pressure In other solutions it is the value of the pressure for which these equations are still valid Cf *activity*

fugin Fugutoxin, tetrodonine A poisonous protein in the organs of *Tetrodon* species, a fish of the Japanese and Chinese seas

fugitive Unstable, not fast (as a color)

fugitometer An apparatus for the rapid testing of dyed materials for fastness to light Cf *fadeometer*

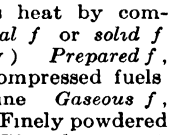
fugugetin $C_{17}H_{12}O_6\,5H_2O$ = 402 5 The coloring matter of fukugi, *Garcinia spicata*, a plant of Japan, m 288 Cf *garcinin*

fugutoxin Fugin

Fulcher spectrum That portion of the hydrogen spectrum between H_α and H_β, which consists of many fine lines due to a lower excitation level of the H_2 molecule

fulgenic acids A group of compounds of the type $R_2C\ C(COOH)\ C(COOH)\ CR_2$, in which R is either a hydrogen, alkyl or aryl radical

fulgides The anhydrides of fulgenic acids, or compounds of the type



They show phototropy, *i e*, change the color under the influence of radiation **diphenyl-** A form (yellow green) $\rightleftharpoons$ B form (blue) **triphenyl-** A form (orange) $\rightleftharpoons$ B form (blue)

fulguration Burning or melting together, with an electric spark Cf *fritting*

fulgurator An atomizer of salt solutions for producing flame spectra

fulgurite Fritted sand produced by lightning passing through the soil

full gas A term for a class of combustible gases, consisting of saturated hydrocarbons, *e g*, water gas

fuller's earth Calcium montmorillonite An impure kaolin containing magnesium and iron, used extensively for decolorizing solutions, oils and other liquids, as a substitute for absorbent charcoal, and medicinally, as a dusting powder

fulmar oil An oil from the petrel species, *Procellaria glacialis*, a seabird of the Northern Coast of England, used as a substitute for cod-liver oil

fulmargin A colloidal solution of silver

fulminate A salt of fulminic acid containing the monovalent CNO— radical **silver** Ag-CNO = 149 89 Small, white needles which explode readily

fulminates A group of explosive compounds (general formula, MONC) consisting of the salts of fulminic acid, used to detonate high explosives

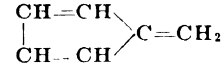
fulminating Capable of causing detonation or explosion **f caps** Small amounts of fulminates used to explode the charge of shells, grenades, torpedoes, etc They usually contain mercuric fulminate **f gold** Aurodiamine **f powder** Percussion powder

fulminic acid CNOH = 43 0 Paracyanic acid ψ-*s*-cyanic acid C N O H An isomer of cyanic acid known only as its very explosive salts

fulminurate. A salt of fulminuric acid

fulminuric acid $C_3H_3N_3O_3$ = 129 14 *2*-Cyano-*2*-nitroethanamide*, isocyanuric acid, cyanonitroacetamide, $CN\,CH(NO_2)\,CONH_2$ Colorless needles or prisms, m 138 explode at 145, soluble in alcohol, water, or ether It is a trimer of cyanuric acid Cf *pentoxime*

fulvene (1) C_6H_6 = 78 1 Methylenecyclopentadiene An isomer of benzene, a yellow oily liquid



(2) A general term for colored products formed on exposure of indanthrene resins to light **benzo-** See *benzofulvene*

fumaramic acid $C_4H_5O_3N$ = 115 1 NH_2-CO CH CH COOH Colorless crystals, m 217

fumaramide $C_4H_6O_2N_2$ = 114 1 NH_2CO CH - CH $CONH_2$ Colorless crystals, m 266

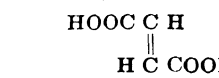
fumarhydrazide $C_4H_6O_2N_4$ = 142 1 Colorless crystals, m 220

fumaria The dried herb of *Fumaria officinalis*, common fumitory, used medicinally as a sedative, general tonic and alterative

Fumariaceae A family of herbs yielding alkaloids

Corydalis cava	corydalis
Corydalis tuberosa	corydaline
Dicentra pucilla	dicentrine
Fumaria officinalis	fumarine

fumaric acid $C_4H_4O_4$ = 116 05 *trans-* Butenedioic acid*, *trans-1 2*-ethylene dicarboxylic acid A dibasic acid occurring in *Fumaria officinalis*, and an isomer of maleic acid trans-ethylene dicarboxylic acid, allomaleic acid,



Colorless prisms, d 1 635, m 286, b 290, (sublimes), slightly soluble in water, soluble in alcohol or ether **ethyl-** $C_6H_8O_4$ = 144 1 Ethylethylene dicarboxylic acid Colorless crystals, m 194 **methyl-** Mesaconic acid

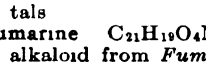
f acid series A group of dibasic acids with a double bond, general formula, $C_nH_{2n-4}O_4$ There are many isomers, *e g* ,

fumaric, maleic acid	HOOC C_2H_2 COOH
glutaconic, citraconic, itaconic, ethidenemalonic, mesaconic acid	HOOC C_3H_4 COOH
allylmalonic, propylidenemalonic, hydromuconic, pyrocinchonic acid	HOOC C_4H_6 COOH
allylsuccinic, carboprolactonic, teraconic acid	HOOC C_5H_8 COOH
xeronic acids	HOOC C_6H_{10} COOH
cetylmalonic acid	HOOC $C_{17}H_{32}$ COOH

fumarimide $C_4H_4O_2N_2$ = 112 1 Colorless crystals

fumarine $C_{21}H_{19}O_4N$ = 349 2 Protopine An alkaloid from *Fumaria officinalis*, a Papaveraceae Colorless, tasteless crystals, m 199, insoluble in water, soluble in chloroform, benzene, alcohol or ether, used medicinally as an antiphlogistic

fumaroid A structural arrangement of ethylene derivatives characterized by trans-isomerism



Cf *malenoid*

fumarole A small hole from which volcanic gases and vapors escape **f acid** Boric acid **f gases** The vapors escaping from fumaroles, those of Italy contain steam, boric acid, carbon dioxide, ammonia and hydrogen sulfide

fumaryl The bivalent radical —OC CH CH · CO— derived from fumaric acid **f chloride** $C_4H_2O_2Cl_2$ = 152 9 A colorless liquid, d 1 410, b 160

fume A visible or invisible vapor or smoke Fine particles of solid or liquid suspended in a gas **f cupboard** A glass-enclosed shelf or table provided with a fan or other ventilating device for performing experiments involving the production of poisonous or unpleasant fumes or gases

fumigant A gaseous insecticide A substance that produces disinfecting vapors which are used to destroy insects, as,

calcyanide	0 5
chloropicrin	0 8
ethylene oxide	2 0
trichloroethylene	7 0
vinyl chloride	8 0

The figures indicate the pounds per 1000 ft^3 needed to destroy all insects and larvae within 24 hours at 75–80°F

food- A f used to destroy insect pests on foodstuffs, as ethylene oxide, ethylene dichloride, propylene chloride

fumigate To disinfect by means of vapors or smokes

fumigatin $C_8H_8O_4$ = 168 1 *3*-Hydroxy-*4*-methoxy-*2 5*-toluquinone Maroon-colored crystals, m 116, occurring in laboratory cultures of *Aspergillus fumigatus* It has antibacterial qualities Cf *penicillin*

fumigation Disinfection by means of volatile substances

fumigator A closed chamber in which to carry out fumigations

fuming Emitting smoke or vapors, *e g* , fuming nitric acid

function (1) Any specific power (2) In physiology, the work or purpose of an organ (3) In mathematics, one quantity is a function of another when for each value of the latter (y) there corresponds a definite value of the former (x) It is represented thus x = f(y) **chemical-** (1) *simple-* Describes a substance containing only one type of radical, which may, however, be repeated several times in the same molecule, *e g* , an alcohol, glycol, polyhydroxy alcohol (2) *complex-* Describes a molecule having two or more different types of radicals, as, hydroxy aldehydes, amino acids, nitrophenols

fundament The foundation or basis of a structure, either physical or mental

fundamental Pertaining to the basis for groundwork **f chain** The longest chain of a branched hydrocarbon **f units** Units of measurement to which all physical phenomena may be reduced, *i e* ,

L or length, (L^2 = surface, L^3 = volume)
M or mass (M/L^3 = density)
T or time (LMT = velocity, acceleration)
K or the dielectric constant (basis of electrostatic system)
μ or the magnetic permeability (basis of magnetic system)
θ or the temperature

Cf *dimensional equation*

fungi Plural of fungus

fungicide An agent that destroys spores and fungi, as Bordeaux mixture arsenicals, etc

fungisterin Fungisterol

fungisterol $C_{25}H_{40}O$ = 356 3 Fungisterin An inert alcohol in ergot, colorless wax-like masses, m 144

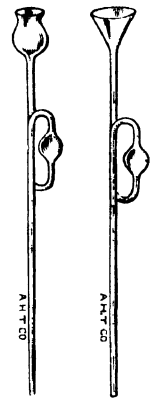
fungus (Plural fungi) (1) A main division of *Thallophyta* or primitive plants, either parasitic or saprophytic, distinguished from *Algae* by the absence of chlorophyll They include

Eumycetes	mushrooms
Schizomycetes	bacteria
Phycomycetes	alga-like fungi
Blastomycetes	yeasts
Hypomycetes	molds

(2) Popularly, the mushrooms and toadstools **f dyestuff** Any pigment obtained from a f , as, muscarufin, litmus

funnel A glass tube with one enlarged, and usually conical end It is used chiefly for filling containers and for filtering solutions **Buchner-** A porcelain funnel having a flat perforated round bottom used for rapid filtration by suction **bunsen-** The ordinary, conical glass funnel **double wall-** A metal funnel with two

walls, between which hot water or steam is circulated Used for the hot filtration of liquids, *e g* , gelatin or agar solutions **dropping-** A separatory f , with long stem and glass stopcock **Hirsch-** A porcelain f with a fixed porcelain plate **hot-air-** Double wall- **hot-water-** Double wall- **separatory-** A funnel of varied shape with a stop-cock on its stem, used to separate immiscible liquids **tap-** Separatory-



Funnel tubes

funnel tube A glass tube with a conical or thistle-shaped top, used to convey liquids into a chemical apparatus

fur (1) An abbreviation for furlong (2) The hairy coat of animals

furac See *lead* and *zinc dithiofuroates*

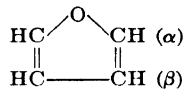
furacrolein Furfur acrolein

f iracrylic Furanacrylic

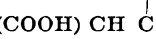
fural Furfural, furfurylidene The bivalent radical O CH CH CH C CH=, derived from furfural, there are two isomers

furaldehyde Furfural

furan C_4H_4O = 68 05 Furfuran, tetrol,



A colorless liquid, $d_{15}°$ 0 9444, b 31, miscible with alcohol or ether, insoluble in water, in pine and fir tar **dimethyl-** C_6H_8O = 96 1 Colorless liquid, d 0 902, b 94, soluble in water A tanning agent and solvent for polyvinyl plastics Cf *uvic acid* **methyl-** Sylvan **tetrahydro-** Butylene oxide **thio-** Thiophen **f carbinol** Furfuralcohol **f carboxylic acid** *2-* Pyromucic acid



3- Furoic acid **f dione** Maleic anhydride **f methylamine** Furfurylamine

furanacrylic acid $C_7H_6O_3$ = 138 05 *β-2-*furylacrylic acid, 2-furalacetic acid White crystals, m 141, b 226, insoluble in water

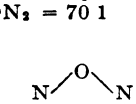
furanose A sugar having a furan ring, as γ-glucose

furanoside A glucoside derived from pentoses, having a furan ring, as, adenosine Cf *pyranoside*

furancarboxylic acid Pyromucic acid

furandione Maleic anhydride

furazan $C_2H_2ON_2$ = 70 1 Azoxazole, oxdiazole



methylethyl- $C_6H_8ON_2$ = 124 1 Ethylmethyl-1 2 5-oxidiazole A colorless liquid, b 170 **phenyl-** $C_8H_6ON_2$ = 146 2 Phenyl-1 2 5-oxidazole Colorless crystals, m 30 **f carboxylic acid** $C_3H_2O_3N_2$ = 114 2 Colorless crystals, m 107 (*methyl-*) $C_4H_4O_3N_2$ = 128 2 Colorless crystals, m 74 **f propionic acid** $C_5H_6O_3N_2$ = 142 2 Colorless crystals, m 86 **f dicarboxylic acid** $C_4H_2O_5N_2$ = 158 2 Colorless crystals, m 178

furfuracrolein $C_7H_6O_2$ = 122 1 Colorless crystals, m 51

furfuracrylic acid $C_7H_6O_3$ = 138 1 A colorless crystalline acid

furfural (1) $C_5H_4O_2$ = 96 06 *α-*Furfuraldehyde, furol, furfurol, furfuryl aldehyde, *2-*furancarbonal*, 2-furaldehyde, C_4H_3O CHO A colorless liquid, turning yellow on standing, $d_{22}°$ 1 159, m −36, b 161, soluble in water, miscible with alcohol or ether Used as a reagent for urea, alkaloids, santonin, cholesterol, ketones, or phenols, and in organic synthesis (2) Fural **3-**, *3-*furancarbonal* A liquid of benzaldehyde odor d 1 111, b 144, n_D^{20} 1 4945

furfuralcohol $C_5H_6O_2$ = 98 07 Furancarbinol, furfurylalcohol, C_4H_3O CH_2OH A solid, m 200, (sublimes), b $_{170mm}$ 168, soluble in water alcohol or ether

furfuraldehyde Furfural

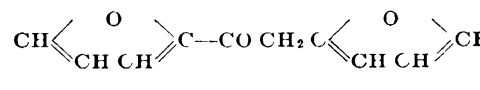
furfuramide $C_{15}H_{12}O_3N_2$ = 268 11 Furfuryl amide Colorless crystals, m 121, decomp 250 It is an isomer of furfurine

furfuran Furan

furfurbutylene $C_8H_{10}O$ = 122 1 Butylfurfuran A colorless oily liquid

furfurine $C_{15}H_{12}O_3N_2$ = 268 1 Light brown rhombic crystals, m 116, insoluble in water, soluble in alcohol or ether An isomer of furfuramide

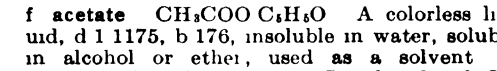
furfurolin $C_{16}H_8O_3$ = 176 1 Furfuryl-furfural, furfuryl-fural The compound



furfurol(e) Furfural

furfurostilbene $C_{10}H_8O_2$ = 160 1 Colorless crystals, m 101

furfuryl The monovalent C_5H_5O— radical, derived from furfural Two isomeric forms



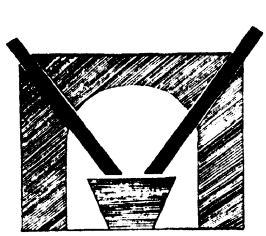
f acetate CH_3COO C_5H_5O A colorless liquid, d 1 1175, b 176, insoluble in water, soluble in alcohol or ether, used as a solvent **f alcohol** $C_5H_6O_2$ = 98 08 Furyl carbinol, C_5H_5O CH_2OH A colorless liquid, $d_{20}°$ 1 136 b 170, soluble in water, alcohol or ether Used as a lacquer solvent **f aldehyde** Furfural **f amide** Furfuramide **f amine** C_5H_7ON = 97 1 Colorless liquid, b 145, soluble in water, alcohol or ether **f fural** Furfurolin **f methylether** $C_6H_8O_2$ = 112 1 A colorless liquid, b 135

furfurylidene Fural

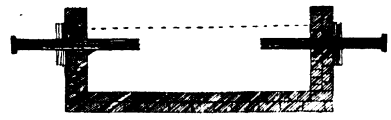
furil $C_{10}H_6O_4$ = 190 1 Difurylglyoxal, bipyromucil C_4H_3O CO CO C_4H_3O Yellow needles, m 165, insoluble in water Cf *furoin* **f dioxime** A color reagent for copper

furlong An eighth part of one mile

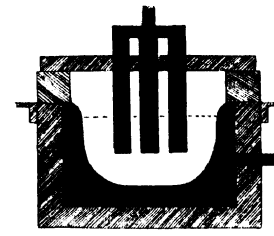
furnace An apparatus for heating fusing or hardening materials by exposing them to high temperatures, the heat may be produced by burning gas, oil, alcohol coal, hydrogen or other fuels, or electrically Classification (see figures)



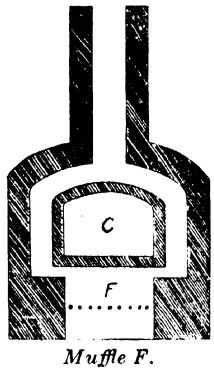
Direct Arc F.



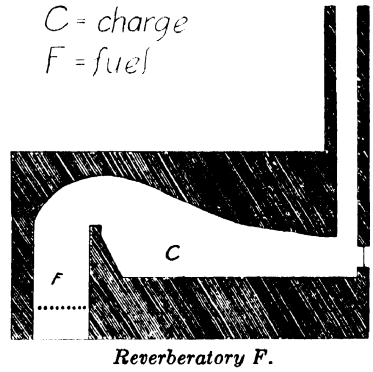
Indirect Arc F.



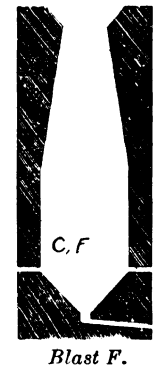
Héroult F.



Muffle F.



Reverberatory F.



Blast F.

Types of furnace.

	The fuel is	*The combustion products are*
blast f.....	+	+
reverberatory f...	−	+
muffle f.....	−	−

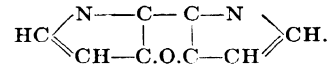
+ in contact with the charge
− not in contact with the charge

arc- A device for obtaining high temperatures by means of an electric arc. **blast-** A tall oven, in which molten iron is produced by heating a mixture of iron ore and coal by a blast of hot air. **crucible-** A small laboratory device for heating crucibles by gas, oil or electricity. **combustion-** An oven, elongated to take a combustion tube, and heated either by a row of bunsen burners or a coil of resistance wire; used in organic analysis. **electric-** See *arc-* or *resistance-*. **Héroult-** An electric arc f. used for the reduction of iron. **induction-** A f. heated from outside by electrically induced currents. **muffle-** A f. made of refractory material, and completely enclosed except for a small air inlet. **reducing-** (1) A shaft f. in which ores are reduced to metals. Cf. *aludel.* (2) A furnace in which incomplete combustion occurs, or an atmosphere of reducing gases is maintained. **resistance-** (1) A modified arc f., in which the electrodes dip into the molten material. (2) A heating device consisting of a wire-wound electrical resistance coil embedded in a refractory material. **reverberatory-** A f. for roasting ores, so constructed that the flame and hot gases are reflected by the curved roof and come in direct contact with the material to be heated, which is not contaminated by the solid fuel. **revolving-** A sloping, revolving metal cylinder lined with fire bricks, down which the charge passes and up which the hot gases are driven. **roasting-** q.v. **tank-** A large oil- or gas-heated container in which glass is melted.

uroates. The methyl, ethyl, butyl, or amyl esters of furoic acid, used in perfumery.

furodiazole. Oxdiazole.

furodipyrrole. $C_8H_4ON_2$ = 144.2. The heterocyclic compound



furoic acid. Pyromucic acid. **f. acid esters.** See *furoates.*

furoin. $C_{10}H_8O_4$ = 192.1. A condensation product of furfuran: $C_4H_3O.CHOH.CO.C_4H_3O$. Colorless crystals, m.135.

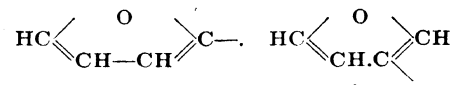
furol. Furfural.

furomonazole. a- Isoxazole. **b-** Oxazole.

furonic acid. $C_7H_8O_3$ = 140.1. Furfuryl acetic acid. Colorless crystals, soluble in water, alcohol, or ether.

furoyl. 2- Pyromucyl. **3-** The monovalent radical CH:CH.O.CH:C.CO—.

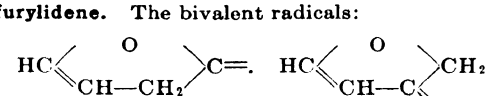
furyl. The monovalent —C_4H_3O radical. Two isomers:



alpha- beta-

Cf. *furfuryl.* **f. acrolein.** $C_7H_6O_2$ = 122.05. *3(2-*furyl)propenal*, $(C_4H_3O)CH:CH.CHO$. Yellow crystals, m.51, b.200, insoluble in water. **f. alcohol.** Furfuralcohol.

furylidene. The bivalent radicals:



α- or 2(3)- β- or 3(2)-

fusain. Mineral charcoal. Mother of coal. A constituent of coal (q.v.).

fuschin. Magenta, erythrobenzene.

fuscochlorin. A dark-green pigment from algæ.

fuscorhodin. A dark red pigment from algæ.

fuse (1) To melt (2) A safety device to protect electrical instruments, consisting of a fine wire which melts when the electric current becomes too strong (3) Fuze A device for igniting an explosive charge **Abel-** An ignition fuse consisting of potassium perchlorate and copper sulfate, and ignited by an electric current **combination-** A military fuse for shells consisting of a time fuse and concussion fuse **electric-** A device for igniting an explosive charge by electric sparks, *e g*, Abel fuse **concussion-** An explosive mixture which ignites by concussion, *e g*, fulminates **time-** A device used in shells, grenades, etc consisting of slow burning material, which ignites an explosive mixture after a certain time

fused Cooled to a compact mass after having been molten or sintered, as fused ash, slag or sodium hydroxide

fused ring A polycyclic compound in which two rings have two atoms in common, *e g* naphthalene, quinoline

fusel oil Potato spirit, fermentation amyl alcohol A crude mixture of isoamyl, amyl, butyl and propyl alcohols, obtained in spiritous fermentation and used as a source of amyl acetate

fusibility The property of solid matter of becoming liquid when heated

fusible Capable of being melted **f alloys** An alloy having a low melting point, which is lower than the mean melting-point of the constituents, *e g* Wood's alloy, Lippowitz metal, etc **f metals** Any metal or alloy of relatively low melting point, as, Na, Pb, Sn Cf metal *bath*

fusing Melting **f point** Melting point

fusion The act of melting or flowing together, *e g*, the transformation of a solid into a liquid by the application of heat and without using a solvent other than a flux **alkaline-** The substitution of the $—SO_3H$ group of an organic compound by the —OH group by means of concentrated NaOH, followed by treatment with acid **aqueous-** The liquefaction of a substance below 100°C, by solution in its water of crystallization **false-** Aqueous- **watery-** Aqueous- **f heat** See *heat* of fusion **f mixture** A mixture of sodium and potassium carbonates, used to fuse insoluble substances of high melting-points and to render them soluble in the form of carbonates **f point** Melting point

fustic (1) *old-* Yellow Brazilwood, fustic wood The wood of *Morus tinctoria*, an Urticaceae of South America, used for making morin and in drying textiles (2) *young-* The wood of *Rhus cotinus*, an Anacardiaceae Cf *osage orange wood, morin*

fustin (1) $C_{58}H_{46}O_{23}$ = 1110 4 A glucoside from the wood of *Rhus cotinus*, an Anacardiaceae Fine silvery needles, m 218, soluble in alcohol or alkalis, hydrolysed to fisetin (2) The coloring matter of the male fern, *Aspidium filix-mas* (3) A coloring matter from sumac (4) The coloring matter of fustic

fuze Fuse (3)

G

g Abbreviation for gram

g A mathematical constant expressing the acceleration of a body due to gravitation It is calculated for any latitude by Helmert's formula g at sea level and equator = 978 038 cm /sec ^{2}, at latitude 45° = 980 624 cm /sec ^{2}

G (1) The Newtonian constant of gravitation $G = (6\ 65786 \pm 0\ 0017) \times 10^{-8}$ dyne cm ^{2} g^{-2} (2) Thermodynamic potential

γ The Greek letter gamma A symbol indicating (1) the third carbon atom of an aliphatic chain (2) In the naphthalene ring, the position opposite to the α-position (3) 10^{-6} gram (4) 10^{-4} gauss **γ-rays** See *gamma rays*

G An abbreviation for yellow (gelb) in describing proprietary colors

G-acid 2-Naphthol-6 8-disulfonic acid

G salt The sodium or potassium salt of G-acid

Ga Symbol for gallium

Gabbet solution A solution of 2 gm methylene blue in 25 gm sulfuric acid and 75 cc water, used in bacteriology for staining

gabbro A group of igneous rocks consisting of plagioclase and pyroxenes

gabianol A dark brown, oily liquid from natural shale, used in diseases of the lung and throat

gadinine $C_7H_{16}NO_2$ = 146 1 A ptomaine from putrefying fish, *e g* , haddock

gadoleic acid $C_{20}H_{38}O_2$ = 310 2 A fatty acid, m 20, from codliver oil

Gadolin, Johann 1760–1852 A Finnish chemist and mineralogist, noted as discoverer of rare earth minerals

gadolinite Principally 4BeO FeO Y_2O_3 $2SiO_2$ Ytterbite Yttria A rare-earth silicate found at Ytterby in black, monoclinic masses, d 4–4 5, hardness 6 5–7 It is a source of Gd, Ho and Re

gadolinium Gd = 156 9 Atomic number 64 A rare earth metal discovered 1880 by Marignac in gadolinite, d 1 31 Principal valency 3 On account of its rarity it is of scientific interest only **g acetate** $Gd(C_2H_3O_2)_3$ $4H_2O$ = 406 4 A colorless crystalline powder, d 1 611, soluble in water **g bromide** $GdBr_3$ $6H_2O$ = 505 4 Colorless crystals, soluble in water **g chloride** $GdCl_3 6H_2O$ = 371 8 A colorless crystalline powder, soluble in water **g oxalate** $Gd_2(C_2O_4)_3$ $10H_2O$ = 758 76 Monoclinic crystals, dehydrated at 110°C , slightly soluble in water **g oxide** Gd_2O_3 = 362 6 Colorless crystals or a white powder, insoluble in water, soluble in acids **g hydroxide** $Gd(OH)_3$ = 208 3 An amorphous white powder, insoluble in water, soluble in acids **g sulfate** $Gd_2(SO_4)_3$ $8H_2O$ = 746 8 Colorless crystals, soluble in water

gadose A fat from codliver oil, occurring as a yellow, greasy mass, m 34, soluble in ether chloroform or benzene, slightly soluble in alcohol **anhydrous-** Pure anhydrous gadose **glycerinated-** G containing 25 % glycerin **hydrous-** G containing 25 % water

gadusene An unsaturated hydrocarbon from animal and vegetable oils, chiefly codliver oil

gagat A variety of soft coal

gage (1) An instrument for measuring the dimension of an object, or the pressure or flow of a liquid (2) The diameter of a wire, the thickness of a sheet or plate **high and low-** A g which registers both, maximum and minimum dimensions **hot wire-** (1) A resistance wire sealed in a vacuum tube and used to measure very low pressures by determining (a) change of current at constant voltage, (b) change of total watts at constant temperature (resistance), (c) change of resistance at constant current (2) A small thermocouple, q v **ionization-** A device for measuring low pressures by the ionization produced in a gas by a definite electron current With a galvanometer the sensitivity is 10^{-7} amps (= 10 milliamp) **McLeod-** q v **resistance-** Hot wire g

Gahn, Johann Gottlieb 1745–1818 A Swedish mineralogist, and discoverer of manganese (1780)

gahnite $ZnAl_2O_4$ Automolite, zinc-spinel A variously-colored, vitreous zinc aluminate, d 4–4 6, hardness 7 5–8

gaidic acid $C_{18}H_{30}O_2$ = 254 3 A monobasic, unsaturated acid, and homolog of elaidic acid Colorless crystals, m 39

Gaillard tower An absorption tower in which a spray of lead chamber sulphuric acid falls through rising furnace gases and is concentrated

gaine An intermediate explosive, used to pass on the action of the detonator to the main, less-sensitive explosive charge

gainic acid $C_{40}H_{12}O_{14}$ = 716 1 An acid in humus

gaize A very friable argillaceous sandstone, which is converted into a pozzolana when heated

gal Abbreviation for gallon

galactagogue A drug which increases the secretion of milk

galactan $(C_6H_{10}O_5)_x$ = $(162\ 08)_x$ Gelose The carbohydrate in the cell-wall of algae, *e g* , *Irideae*, *Laminarioides*, obtained as a dextrorotatory gum from agar-agar It yields galactose on hydrolysis, and mucic acid on oxidation, insoluble in cold water, alcohol, acids and alkalis

galactase A proteolytic enzyme of milk resembling erepsin

galactin $C_{54}H_{78}O_{45}N_4$ = 1510 62 An amorphous substance derived from milk

galactolipins Cerebrosides Lipin substances of animal and vegetable tissues, as, phrenosin, kerasin, nervone

galactometer (1) A graduated glass funnel for determining the fat in milk (2) A hydrometer for determining the specific gravity of milk

galactonic acid $C_6H_{12}O_7$ = 196 1 Pentahydroxy-hexoic acid A monobasic acid, m 97, b 141, derived from galactose Cf *lactonic acid*

galactosamine $C_6H_{11}(NH_2)O_5$ = 179 11 The amine of galactose

galactosan Galactan

galactosazone $C_{18}H_{21}O_4N_4$ = 357 21 The phenylosazone of galactose, yellow needles, m 192–195

galactose $C_6H_{12}O_6$ = 180 03 Dextrogalactose, pentahydroxy-hexanol, cerebrose **d-** A hexose sugar, derived from milk sugar by hydrolysis either by fermentation or mineral acids Colorless, hexagonal scales, m 168, soluble in water, slightly soluble in alcohol **l-** Laevogalactose, m 162–3, soluble in water, very soluble in alcohol

galactoside Cerebroside A group of glycolipins containing nitrogen, galactose and a fatty acid, *e g* , phrenosin, cerasin

galalith Artificial horn prepared by the action of formaldehyde on casein

galangal Galanga, India root, China root, Kaw-liang ginger, kaw liang kiang The dried rhizome of *Alpinia officinarum*, a Zingiberaceae of Asia, used as an aromatic and carminative **g oil** The essential oil, d- 0 910–0 940, of g , it contains d-pinene and cadinene

galangin (1) $C_{15}H_{10}O_5$ = 270 1 A glucoside from the root of galangal Cf *alpinin, kaempferide* (2) *3 5 7*-trihydroxy flavanol, q v

galbanum A gum resin from *Ferula galbaniflua* Whitish, yellowish or reddish tears of wax-like consistency, m 100, used medicinally as an expectorant or antispasmodic, and externally in plasters

galega Goats rue The herb *G officinalis*, a Leguminosae, used as vermifuge and galactagogue

galegine $C_6H_{13}N_3$ = 127 02 *α-2*-isopentenyl guanidine An alkaloid, $Me_2C{:}CHCH_2N{-}C(NH_2)_2$, from *Galega officinalis*, a Leguminosae, used as an insulin substitute

Galen (130-circ 200 A D) An iatrochemist who advocated the use of vegetable in place of mineral preparations in medicine Cf *galenical*

galena PbS Galenite A metallic lead-gray, isometric, lead sulfide, d 7 3–7 6, hardness 2 5 **false-, pseudo-** Sphalerite

galenical Medicines of vegetable origin, especially the liquid preparations, *e g* , decoction, infusion, percolation, fluid extracts, ect Cf *Galen*

galenite Galena

galenobismuthite A sulfobismuthide of lead

galhumic acid Metagallic acid, q v

Galilei, Galileo 1564–1642 An Italian physicist and astronomer, who invented the thermometer and telescope

galipeine $C_{20}H_{21}O_3N$ = 323 2 An alkaloid from angostura bark, colorless needles, insoluble in water

galipene $C_{15}H_{24}$ = 204 19 A sesquiterpene from *Galipea officinalis*, the source of angostura bark

galipidine. $C_{19}H_{19}O_3N$ = 309 2 An alkaloid from angostura bark White, silky lustrous plates, m 110

galipine $C_{20}H_{21}O_3N$ = 323 2 An alkaloid from angostura bark Colorless, slender, lustrous needles, m 115 5

galipol $C_{15}H_{26}O$ = 222 2 A sesquiterpene alcohol in the oil of the angostura bark Colorless crystals, m 89

galipot resin The exudation of *Pinus maritima*, a Pinaceae, a source of pimaric acid Cf *gallipot*

galiquoid. A proposed name for a dispersed colloidal system consisting of a gaseous phase in a liquid phase (*e g* , foams)

galitannic acid $C_{14}H_{16}O_{10}H_2O$ = 362 12 A tannin from the bark of *Galium verum*, a Rubiaceae

gall (1) Bile (2) Nutgalls

gallacetophenone $C_8H_8O_4$ = 168 1 *2 3 4*-Trihydroxyacetophenone, methyl-keto-trioxybenzene, alizarin yellow C A pale yellowish or brownish gray powder, m 168, soluble in water, alcohol, or ether, and used medicinally as an antiseptic for skin diseases

gallal An aluminum gallate, used medicinally as a dusting powder

gallamic acid $C_7H_7O_4N$ = 169 1 The amide of gallic acid

gallanilide $C_{13}H_{11}NO_4$ = 245 09 Gallanol, gallinol, *3 4 5*-trihydroxybenzanilide, $PhNHC_6H_2(OH)_3$ Colorless crystals, m 205, soluble in hot water, alcohol or ether, used medicinally as a dusting powder

gallanol Gallanilide

gallate (1) A salt of gallic acid, $C_6H_2(OH)_3COOM$ (2) A salt of gallic hydroxide, as, $Ga(OH)_3 + NaOH = NaGaO_2 + 2H_2O$

gallein $C_{20}H_{10}O_7$ = 362 1 Gallin, pyrogallolphthalein, anthracene violet A brown powder or greenish lustrous scales, nearly insoluble in water, soluble in alcohol, decomp when heated Used as an indicator in alkalimetry, being very sensitive to alkali (alkalis = bright red, acids = pale brown), in the determination of phosphates in urine, in the manufacture of cerulene and other dyes

gallic (1) Describing a trivalent gallium compound (2) Pertaining to nutgalls **g acid** $C_7H_6O_5H_2O$ = 188 11 3 4 5-trihydroxybenzoic acid White or pale yellow, triclinic crystals or a crystalline powder, d_4° = 1 694, m 225, b 253, (decomp) slightly soluble in water, soluble in alcohol It is a constituent of nutgalls, mangoes, and other vegetable matter, and is used as a reagent for detecting small amounts of ferric salts and mineral acids **g bromide** Gallium bromide **g chloride** Gallium chloride **g compounds** See *gallium* **g hydroxide** Gallium hydroxide **g iodide** Gallium iodide **g nitrate** Gallium nitrate **g oxide** Gallium trioxide **g sulfate** Gallium sulfate

gallicin $C_8H_8O_5$ = 184 1 Methylgallate, methyl gallic ester Colorless needles or rhombic prisms, m 202, soluble in hot water, alcohol, or ether, used medicinally as a nontoxic antiseptic dusting powder

gallin, Gallein

gallinol Gallanilide

gallipot A small glazed earthen-ware jar used by druggists Cf *galipot*

gallitannic (1) Galitannic (2) Gallotannic

gallium Ga = 69 72 Austrium A metallic element of the third sub-group of the periodic system, atomic number 31 Bluish or grayish-white octahedric crystals, d 5 94, m 30 15 to a mercury-like liquid It was discovered in 1875 by Lecoq de Boisbaudran in zinc blende, after its existence had been predicted in 1869 by Mendelejeff from the periodic system (eka-aluminum) The valencies of gallium are 2 and 3, hence it forms gallous and gallic compounds the latter being the stabler Like aluminum it forms alums of the general formula, $MGa(SO_4)_2 12H_2O$ *e g* , $NH_4Ga(SO_4)_2 12H_2O$,

ammonium gallium sulfate Used for quartz thermometers (500–1000°C), for brightening optical mirrors, as a substitute amalgam in filling teeth, and for vacuum lamps, instead of mercury **g acetate** $4Ga(C_2H_3O_2)_3 2Ga_2O_3 5H_2O$ = 1312 7 White crystals, decomp 128, soluble in water **g acetylacetonate** $Ga(C_5H_7O_2)_3$ = 366 88 White monoclinic (α) or rhombic (β) crystals, d α-1 42, β-1 41, m 194, soluble in water **g bromide** $GaBr_3$ = 309 9 G tribromide, gallic bromide Colorless deliquescent crystals, soluble in water **g chloride** See *g. dichloride*, and *g trichloride* **g dibromide** $GaBr_2$ = 229 9 Gallous bromide A colorless powder, decomp by water **g dichloride** $GaCl_2$ = 140 9 Gallous chloride Colorless crystals, m 164, b 535, decomp by water **g diiodide** GaI_2 = 323 7 Gallous iodide A colorless powder, decomp by water **g hydride** Ga_2H_6 = 145 4 A gas, m −21, decomp 130 **g hydroxide** $Ga(OH)_3$ = 120 7 Gallic hydroxide A white powder, insoluble in water **g iodide** GaI_3 = 450 5 Gallium tribromide, gallic iodide A white powder, soluble in water **g monoxide** GaO = 86 0 Gallous oxide A bluish mass obtained by heating Ga_2O_3 in a stream of hydrogen **g nitrate** $Ga(NO_3)_3$ = 256 2 Colorless crystals, soluble in water **g oxalate** $Ga_2(C_2O_4)_3 4H_2O$ = 475 50 A white microcrystalline powder, insoluble in water **g sulfate** $Ga_2(SO_4)_3$ = 428 0 Gallic sulfate Colorless crystals, soluble in water or alcohol It forms double salts with alkali sulfates analogous to alums, *e g*, gallium ammonium sulfate, $Ga_2(NH_4)_2(SO_4)_4 24H_2O$ **g sulfide** Ga_2S_3 = 235 4 A white powder, insoluble in water **g tin alloy** A liquid metal, m 15, consisting of 88 % Ga and 12 % Sn **g tribromide** See *g bromide* **g trichloride** $GaCl_3$ = 176 35 Gallic chloride Colorless, deliquescent needles, m 75 5, b 220, very soluble in water or alcohol **g trioxide** Ga_2O_3 = 187 4 Gallic oxide, **g oxide** A colorless, friable mass, insoluble in water and acids

gallobromol $C_7H_4O_5Br_2$ = 327 9 Dibromgallic acid A light brown powder or fine needles, m 205, slightly soluble in cold water, soluble in hot water, alcohol, or ether Used medicinally for neurasthenia and epilepsy

gallocyanin $C_{15}H_{12}O_5N_2$ = 300 3 A bluish-purple dye obtained from nitrosodimethylaniline and gallic acid, used as a dye

galloflavin $C_{12}H_8O_8$ = 277 0 A yellow dye

galloformin A condensation product of gallic acid and hexamethylene tetramine Colorless needles used as an internal antiseptic

gallogen $C_{14}H_6O_8$ = 302 1 Anhydrous ellagic acid A constituent of divi-divi, the pods of *Caesalpinia coriaria* occurring as a yellow, odorless and tasteless powder, insoluble in water or acids, soluble in alkalis, used medicinally as an astringent and antidiarrhetic.

gallol Gallinol

gallols A group of compounds of pyrogallol, resorcinol and chrysarobin with various acids, as

eugallol	pyrogallol monoacetate
lenigallol	pyrogallol triacetate

gallon A measure of liquids The U S gallon has a volume of 231 cubic inches, the Imperial or English gallon 277 274 cubic inches 1 U S gallon = 3 785332 liters = 4 quarts = 8 pints = 0 833 imp gallons

1 Imperial gallon = 4 54596 liters = 277 420 cubic inches = 1 20032 U S gallons = the volume occupied by 10 lbs of distilled water at 62°F, bar 30 in

gallotannic acid $C_{76}H_{52}O_{46}$ = 1700 3 A glucoside from Chinese gall nuts, sumac, tea, etc, which hydrolyses to glucose and digallic acid Cf *tannin*

gallotannin Tannic acid

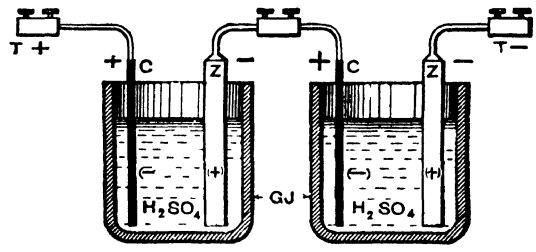
gallous Any divalent gallium compound **g bromide** Gallium dibromide **g chloride** Gallium dichloride **g iodide** Gallium diiodide **g oxide** Gallium monoxide

galloyl The radical $(HO)_3C_6H_2CO$— from tannin, q v

gallulmic acid Metagallic acid

Galvani, Luigi 1737–1798 An Italian physician and anatomist, who accidentally discovered the galvanic current

galvanic Voltaic Pertaining to an electric current produced by chemical action **g battery** A series of voltaic cells **g current** A stream of electrons produced by a displacement reaction as in an electric or voltaic cell Cf *cell* **g element** Voltaic cell **g pile** A series of disks of two different metals, placed alternately over each other and separated by moistened paper, formerly used for producing a galvanic current



Galvanic battery of carbon zinc cells

galvanism A branch of physics which deals with electric currents produced by chemical action, as opposed to those produced by heat, friction, or induction

galvanize, -ise To protect a metal with a layer of a less oxidizable metal by electric means

galvanized iron (1) Iron coated with tin by electrolysis, and then immersed in a zinc bath (2) Iron immersed in molten zinc and so coated by that metal without the aid of electricity

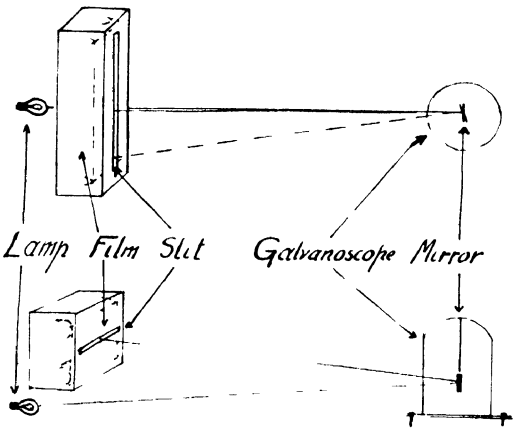
galvanograph The photographic record of a sensitive galvanometer arranged so that its mirror deflects a beam of light on to a moving film or paper (see figure)

galvanolysis An obsolete term for electrolysis

galvanomagnetic effect (1) A galvanomagnetic difference in potential, see *Hall effect* (2) A galvanomagnetic difference in temperature, see *Ettinghausen effect*

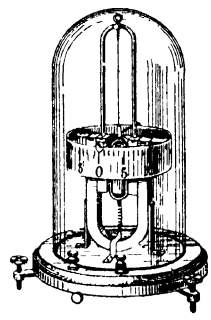
galvanometer An instrument for detecting and measuring the strength of an electric current It consists essentially of a magnetic needle suspended in a wire coil The slightest deflection of the needle produced by a current through the coil is measured by some optical system, *e g*, reflection of a beam of light from a mirror attached to the needle, and observation of the reflected beam on a scale The coil

may be fixed and the magnet moveable, or vice versa Cf *potentiometer*, *polarograph* **absolute-** An instrument directly measuring current by means of two equally strong electromagnets **astatic-** An instrument in which two magnetic needles of equal magnetic moment are



Galvanograph arrangement

suspended parallel to one other, but with their poles in opposite directions Terrestrial magnetism is thus eliminated and the needles swing freely under the influence of the current **ballistic-** A galvanometer for the determination of the capacity or energy produced in the discharge of a condenser **differential-** An instrument with two equal coils through which two separate currents are sent and their comparative strengths thus determined **D'Arsonval-** A delicate g in which a magnet and mirror is suspended inside a coil and the deflection of the mirror is read by means of a reflected light beam on a scale, or the scale may be read in the mirror by means of a telescope Cf *galvanograph* and figure **Einthoven-** String-, or thread- A delicate instrument for detecting minute electric currents, consisting of a silvered quartz thread or platinum thread stretched between the poles of a strong magnet The shadow of the thread, magnified by a microscope, is read on a screen **Kelvin-** q v mirror- Reflecting- **photo-** Galvanograph, q v **reflecting-** Mirror- A small mirror attached to the galvanic needle Its deflection is read on a scale by reflected light **sine-** An obsolete type of g in which the current passing is proportional to the sine of the angle of deflection **string-** Einthoven g **tangent-** The strength of the current through a tangent g is proportional to the tangent of the angle of deflection **thread-** Einthoven g



D'Arsonval galvanometer

galvanometry The branch of physics dealing with the measurement of the strength of electric currents

galvanoscope Quadrant electrometer An instrument indicating the presence and direction of an electric current, but not its strength It consists essentially of a magnetic needle inside a wire coil

galvanostegy (1) Galvanotropism (2) Electrolytic tinning as a protection against hardening by the nitrite process

galvanotaxis The response of a living organism or single cell to a galvanic current

galvanotropism Galvanostegy The orientation or motion of living cells in a galvanic current

galyl $C_{24}H_{32}O_8N_4P_2As_4$ = 856 5 Tetroxy diphospho-amino-diarseno-benzene An antisyphilitic preparation, said to be less toxic than salvarsan

gama wax Candelilla wax

gambin $C_{10}H_7O_2N$ = 173 1 *R* or g Reddish, β-nitroso-α-naphthol A nitroso dye *Y* or g Yellowish, nitrosonaphthol, α-nitroso-β-naphthol A nitroso dye

gambir Pale catechu The dried extract from a decoction of the leaves and twigs of *Ourouparia* or *Uncaria gambir*, a Rubiaceae of Asia An odorless brown powder, insoluble in water, soluble in alcohol, used, as tincture or fluid extract, as an astringent and tanning material **g catechol carboxylic acid** $C_{16}H_{14}O_8$ = 334 11 A white solid from gambir, *d*-β- m 259, *l*-β- m 261, *dl*-β- m 252

gamboge Camboge, cambogia, gummi guttae A gum resin from *Garcinia hanburii* and other species of Guttiferae Grayish or orange brown cylindrical pieces, insoluble in water forming a colloidal solution, soluble in alcohol, used medicinally as a hydragogue and cathartic, also as pigment

gamete A sexual cell capable of uniting with another sexual cell to form a zygote, or fertilized cell

gamma (1) The third letter of the Greek alphabet, γ or Γ (2) A unit of weight, γ = the one-millionth part of a gram microgram, 0 001 mg or 0 000,000,353 ounce (3) A unit of magnetic field intensity, γ = 0 000,01 gauss (4) The g position **g acid** γ-acid 2 5-Naphthylamine sulfonic acid An intermediate in dyestuff manufacture **g iron** An allotropic, non-magnetic variety of iron existing above 860°C , and crystallizing in the cubic system **g particles** A misnomer for g rays **g position** (1) The third carbon atom in an aliphatic chain, as, γ-chloro-hexane (2) The third atom of a pentacyclic, or the fourth atom of a hexacyclic compound, as γ-naphthalene substitution, *i e* , the position following the β-position and opposite the α-position **g rays** γ-rays Radiations similar to x-rays, (q v), but having shorter wavelengths, emitted by radioactive substances (q v), as secondary radiation caused by β-rays striking matter

gammagraph A radiograph obtained by the use of γ-rays

gangaleodine $C_{18}H_{14}O_7Cl_2$ = 413 0 A depsidone which occurs in lichens of the *Lecanora* species

ganglion A nerve cell

gangue The earthy portion of an ore (calcite, quartz, barites, fluorspar) It forms a fusible slag which flows away from the metallic portion on reduction Cf *flotation*

ganister A fine, compact, hard sandstone, used for grinding and for furnace hearths

ganja, ganjah The rounded, compressed masses of cannabis as exported from Calcutta

ganomalite $(Ca\ Mn)Pb_3Si_3O_{11}$ A rare lead-manganese silicate

ganomatite $(Fe\ As\ Sb)_2O_3$ A grayish, reddish, or brownish mineral d 2 3

ganophyllite $Mn_7Al_2Si_8O_{26}\ 6H_2O$ A brown monoclinic aluminum-manganese silicate

garage poison Petromortis A mixture of carbon monoxide and air from the exhaust of combustion engines occurring in garages or tunnels and subways with automobile traffic

garancin A preparation made from madder, containing the coloring matter of madder in readily available form One part garancin has the same dyeing powers as 3–4 parts of madder

garantose A brand of saccharin, q v

garbage Waste and refuse from kitchens and households **g tankage** The dried and ground product obtained by steaming and degreasing g used as fertilizer

garcinin A pigment isolated from fukugi, used as a dye for silk Cf *fugugetin*

garden celandine The dried herb of *Chelidonium majus* used medicinally as a cathartic diuretic and diaphoretic

gardenic acid $C_{14}H_{10}O_6 = 274\ 1$ A quinone split-product of gardenin

gardenin $C_{14}H_{12}O_6 = 276\ 1$ A yellowish crystalline principle from the resin of *Gardenia lucida* a tree of Southern Asia

gardinol A detergent made by reduction of sulfonated fatty acids to the corresponding alcohols *e g*, HO R HSO_3

gargle (1) A solution containing disinfecting substances for rinsing the mouth and throat (2) To wash the throat

garlic Allium The fresh bulb of *Allium sativum* a Liliaceae, used medicinally as an irritant and expectorant and as a condiment **g oil** The essential oil of g, d 1 046–1 057 It contains allyl-propyl disulfide diallyl-disulfide and the compounds $C_6H_{10}S_3$ and $C_6H_{10}S_4$

garnet A dark red yellowish, or greenish transparent silicate of the general type $A_3B_2Si_3O_{12}$ in which B is a trivalent metal (Al Fe or Cr) and A a divalent metal (Ca Mg Fe Mn) Many of the garnet varieties are used as gems the common garnet is usually almandite **g rock** A metamorphic rock containing garnet as an accessory mineral *e g* garnet-mica schists garnet gneiss garnet-olivine rock, and garnet hornfels

aluminum- $R_3Al_2Si_3O_{12}$ 1 *grossularite* $Ca_3Al_2Si_3O_{12}$ occurring in the following varieties hessonite = yellowish brown, succinite = amber colored romanzovite = brown wiluite = pale green 2 *pyrope* $Mg_3Al_2Si_3O_{12}$ deep red to black crystals d 3 7 3 *almandite*, $Fe_3Al_2Si_3O_{12}$, red to dark red d 3 9–4 2 and cut into gems 4 *spessartite*, $Mn_3Al_2Si_3O_{12}$, red to brown, d 4 2 **calcium-** Essonite **chromium-** $R_3Cr_2Si_3O_{12}$ 5 *uvarovite* $Ca_3Cr_2Si_3O_{12}$, emerald green d 3 5 **iron-** $R_3Fe_2Si_3O_{12}$ 6 *andradite*, $Ca_3Fe_2Si_3O_{12}$, occurring in the varieties topazolite = yellowish green colophonite = amber, melanite = black pyreneite = grayish black jelleteite = green dematoid = light green 7 *manganese garnet* $Mn_3Fe_2Si_3O_{12}$ occurring in the varieties rothoffite = yellowish brown allochroite = light green to black polyadelphite = brownish yellow to green aplome = yellowish green 8 *sodium garnet* $Na_6Fe_2Si_3O_{12}$ lagoriolite **manganese-** See *iron g* (7) **sodium-** See *iron g* (8) **titanium-** $R_3Fe_2(Si\ Ti)_3O_{12}$ *e g schorlomite* $Ca_3(Fe\ Ti)_2(Si\ Ti)_3O_1$

garnierite $(Ni\ Mg)Si_2O_5\ xH_2O$ Noumeite, numeite A bright green amorphous nickel-magnesium silicate d 2 5–4 hardness 7 5–8

garryine An alkaloid from the leaves of *Garrya fremontii* or skunk bush, a Cornaceae of California and Oregon

gas (1) The vaporous or air-like state of matter defined as a non-elastic fluid in which the molecules are in free movement, and their mean positions far apart Gases are characterized by their tendency to expand indefinitely to diffuse and mix readily with other gases, to have definite relations of volume, temperature and pressure and to condense or liquefy at low temperatures or under sufficient pressure One cubic centimeter of any gas contains under standard conditions 27×10^{18} molecules Cf *Avogadro's Charles* and *Boyle's law* (2) Illuminating or fuel gas **air-** An illuminating and fuel gas made by blowing air through hydrocarbons **anesthetic-** The vapors of a volatile anesthetic as ether or chloroform or an anesthetic gas (nitrous oxide, ethylene or acetylene) **atmospheric-** The gaseous constituents of the atmosphere Cf *atmosphere abundance of elements* **Blau-** q v **chlorine-** Chlorine **coal-** An illuminating and fuel gas distilled from coal, consisting of aliphatic hydrocarbons methane ethane etc **coercible-** Liquefiable- **combustible-** An inflammable gas produced by incomplete combustion and containing chiefly carbon monoxide *e g* coke gas, coke oven gas **compound-** A gaseous compound *e g*, methane carbon dioxide **compressed-** See *compressed gases* **electrolytic-** A mixture of 2 vols of H_2 and 1 vol of O_2 **elementary-** A gaseous element an element which is gaseous under ordinary conditions *e g* chlorine fluorine hydrogen nitrogen oxygen and the noble gases **fluorine-** Fluorine **forest-** Producer gas obtained from wood and wood-charcoal used as a fuel **fuel-** A gas used as fuel *i e* for the production of heat by combustion **full-** An inflammable gas consisting of saturated hydrocarbons *e g* water gas **hydrogen-** Hydrogen **ideal-** Perfect- **illuminating-** A gas used for the production of light, *e g* Common gas (coal gas) natural gas, water gas or oil gas **inflammable-** A gas which is able to burn in air, *e g*, hydrogen **industrial-** G produced commercially and used in trades and industries **inert-** (1) Noble gases (2) A gas which does not react chemically *e g* nitrogen is an inert gas towards living organisms **intestinal-** The gases produced during digestion consisting of nitrogen hydrogen sulfide etc **lachrymatory-** Any gas which produces a profuse secretion of tears **laughing-** Nitrous oxide **lighting-** Illuminating- **marsh-** Methane **natural-** (1) The inflammable gases from oil wells used in certain communities as an illuminating and fuel gas they consist mainly of paraffins (methane etc) small amounts of hydrogen ethylene carbon dioxide, and carbon monoxide (2) Helium **noble-** The members of the zero group of the periodic system consisting of entirely inert elements He, Ne Ar Kr, X and Nt **oil-** An illuminating and fuel gas distilled from crude petroleum **noxious-** Any poisonous g or a g with a strong odor **oil-** Natural g **olefiant-** Ethylene **oxygen-** Oxygen **perfect-** A fluid

INDUSTRIAL GASES

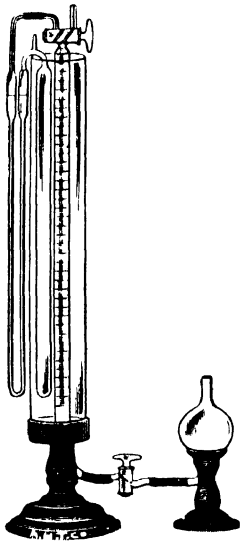
Name (1)	Formula (2)	B P (3)	T_c (4)	P_c (5)	C_p/C_v (6)	Use (7)	Pressure (8)
helium	He	−268 8	−267 9	2 26	–	L B	1500
hydrogen	H_2	−252 5	−239 9	12 8	1 510	W B	1800
neon	Ne	−243	−228 8	26 9	–	L	
nitrogen	N_2	−195	−147 1	33 5	1 404		1500
air compressed			−140	39	1 5	R	1500
argon	A	−186	−122 4	48 9	1 67	L	1800
oxygen	O_2	−182	−118 8	49 7	1 401		1500
methane	CH_4	−164	− 95 5	50	1 31	I	1500
krypton	Kr	−152	− 62 5	54 2	–	L	
xenon	Xe	−109	14 7	57 2	–	L	
ethylene	C_2H_4	−102 7	9 7	50 5	1 255	A	1250
nitrous oxide	N_2O	− 90	38 8	77 5	1 303	A	800
ethane	C_2H_6	− 86	35	50	1 22	I	525
carbon dioxide	CO_2	− 85	31	73	1 304	R C	800
acetylene	C_2H_2	− 83	36 5	61 6	1 26	W A	
hydrogen sulfide	H_2S	− 61 8	100	88 7	1 32	C	260
propane	C_3H_8	− 39	95 6	44	1 13	I	110
propylene	C_3H_6	− 37	92 3	45	–	A	125
ammonia	NH_3	− 38	130	115	1 31	R C	115
cyclopropane	C_3H_6	− 35				A	75
chlorine	Cl_2	− 33 6	144	76	1 35	C	70
freon	CCl_2F_2	− 29 8	111	39	1 138	R	
methylchloride	CH_3Cl	− 23 5	143	66	1 28	R	80
butylene	C_4H_8	− 18				I	40
sulfur dioxide	SO_2	− 10	155 4	78 9	1 29	C R F	35
butane	C_4H_{10}	1	153	36	1 1	I	22
phosgene	$COCl_2$	8 2	182	56	–	F	30
ethylene oxide	C_2H_4O	14	192	–	1 1	F	
methylenechloride	CH_2Cl_2	40	216	102	1 22	R	
dichloroethylene	$C_2H_2Cl_2$	50	243	55	1 15	R	

(3) Boiling point in °C
(4) Critical temperature in °C
(5) Critical pressure in atmospheres
(6) Ratio of specific heat capacity at constant temp and pressure (15°C)
(7) Principal uses A anesthetic B airships, C chemical reactions F fumigant, I illuminant and fuel L lamps R refrigerant W welding
(8) Pressure in shipping cylinder (pounds per square inch)

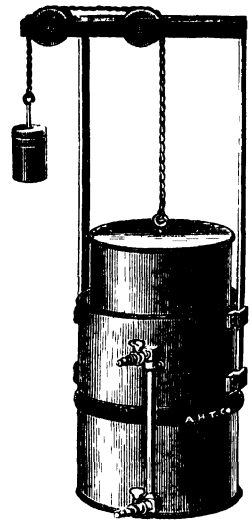
which obeys the gas laws None is known, but it is assumed that as the pressure on a gas becomes infinitely small the gas approaches nearer and nearer to the ideal state where there is no viscosity or internal resistance to molecular motion **permanent-** An obsolete term for gases which are not liquefyable, with sufficiently low temperature and high pressure all gases condense to liquids hence this term has only a relative meaning **petroleum-** Oil **poison-** A harmful gas, used in chemical warfare Classification (a) Lung irritants (chlorine phosgene, diphosgene, chloropicrin) (b) Lacrimators (bromoacetone ethyliodoacetate bromobenzyl cyanide, chloracetophenone) (c) Sternutators (diphenyl cyanarsine, diphenylamine chlorarsine) (d) Vesicants (mustard gas lewisite) **rich-** Full- **rock-** Natural- **sewer-** The gaseous products from a sewer containing the vapors resulting from the decay of organic material **sternutatory-** A gas which produces *sneezing* **suffocating-** Any gas which is non-respirative causes smothering and finally stops respiration **sun-** The gaseous constituents of the sun *e g* hydrogen helium, carbon dioxide, etc **toxic-** A gas which causes poisoning **two dimensional-** A layer of adsorbed atoms cf *adatom* **vesicant-** A gas which produces blisters of the skin used in chemical warfare **volcanic-** A group of gases issuing from volcanoes which consist of carbon dioxide nitrogen hydrogen sulfur-dioxide hydrogen sulfide etc in varying quantities **war-** Poison- **water-** An illuminating and fuel gas prepared by passing steam over glowing coal, and enriching the hydrogen thus produced by hydrocarbons and carbon monoxide There are many varieties which differ according to the conditions of manufacture (Mond gas blue gas water gas etc)

g analysis Gasometric analysis The qualitative and quantitative detection and determination of gases **g analysis apparatus** Devices used in gasometric analysis, see *Allen, Burrell Haldane Orsat, Petersen, etc apparatus* **g bag** An oval rubber container for holding gases **g balance** A balance for determining the specific gravity of gases **g ballons** A blown spherical glass container with one or more necks used for weighing gases **g bath** Air bath **g battery** G cell **g black** Lamp black **g bleaching** Bleaching by sulfur dioxide or chlorine **g buret** A graduated glass tube with stopcocks on both ends used in gasometric analysis (see figure) **g burner** A burner using gas as fuel **g calorimeter** An

analytical apparatus for determining the heat value, dust, moisture and tar contents of inflammable gas **g carbon** The amorphous, compact residual carbon remaining in the retorts after distillation of gas from coal, used for electrodes in cells and arc lamps **g cell** An electrolytic cell formed by the combination of two gas electrodes, *e g*, the E M F of polarization in the electrolysis of water **g collecting tube** An elongated cylinder or bulb closed at each end by a stop-cock **g constant** The



Gas buret



Gasholder

constant, R, in the gas-law equation pv = RT This constant, is independent of the chemical nature of a gas, but depends on the units of measurement chosen $R = pv_0/T_0$, where p, v and T are the pressure, volume, and temperature under the conditions of an ideal gas respectively

When p is expressed in gm /cm ^{2}, and v in cm^3 R = 84 780 gm cm /T

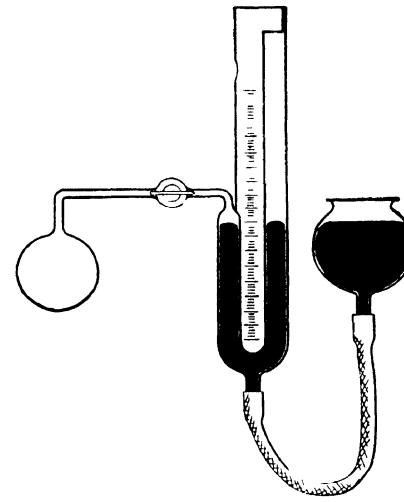
If p is in atmospheres, v in liters R = 0 08204 l atm /T

If p in dynes, v in cm ^{3} $R = 8\ 315 \times 10^7$ ergs/g mol (or = 1 98 calories)

If p in kg /m ^{2}, and v in cm ^{3} $R = 8\ 48 \times 10^5$ kg m ^{2}/T

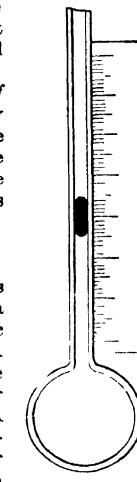
To derive R for 1 gram of gas, it should be divided by the molecular weight (O = 16)

See also *equations of state* **g cylinder** A long steel tank or iron bottle used in shipping liquefied gases, such as carbon dioxide, oxygen, hydrogen, ammonia, chlorine, etc See *compressed gases* **g distributor** A three-, or four-way stop-cock **g electrode** An electrode, usually of a finely-divided metal, which, by virtue of its power to dissolve or hold a gas on its surface, behaves as a reversible electrode when placed in a solution See *hydrogen electrode* **g engine** An engine in which the motive power is obtained by the combustion of a gas or gas-mixture in the cylinder **g filter** A device for removing solid or liquid particles from gases **g generating bottles** A device for generating gases in the laboratory, as a Kipp generator **g generators** A machine for the manufacture of gases, *e g*, the retort of a gas plant **g holder** A storage tank for holding gases at atmospheric pressure, it consists of two overlapping halves expanding



Constant volume gas thermometer

within each other and sealed by a liquid (see figure), or, the gas may be displaced from a gas-tight container by allowing water to flow in **g laws** The combination of Boyle's, Gay-Lussac's, and Charles' laws in the equation PV = RT, where V is the volume occupied by the molecular weight in grams, under a pressure P and at temperature T and R is the g constant, q v See *equation of state* **g liquor** The watery liquor which results from the washing of gas obtained in the distillation of coal It is a source of ammonia, and also contains sulfides and carbonates **g manometer** A steam gage, q v **g mask** Respirator **g meter** Gasometer **g pipet** A series of glass bulbs mounted on a frame, used in gasometric analysis **g regulator** (1) A device for regulating the pressure of the gas taken from a cylinder in which it is compressed (2) A device for regulating the temperature of a gas-heated incubator or water-bath by controlling the gas supply **g thermometer** An apparatus for measuring temperature by the variation in pressure or volume of a gas, generally hydrogen *constant volume*- designed to observe the variation in the pressure of a gas confined at constant or nearly constant volume *constant pressure*- designed to demonstrate the change in volume of a gas confined at constant pressure, generally air-pressure (see figures)



Constant pressure gas thermometer

gaseous The third state of matter, as opposed to the solid and liquid state

gasogene Charcoal gas used as fuel

gasolene, gasoline Petroleum ether The third fraction obtained on distillation of petroleum or crude oil, b 75, consisting chiefly of paraffins, *e g*, hexane, heptane Used as a fuel in

combustion engines, as a solvent and cleaning agent. Cf. *oronite*. **ethyl-** See *ethyl*.

gasoloid. A proposed name for a dispersed system which consists of a gaseous dispersed phase in a solid surrounding phase; *e.g.*, gas of occlusion (see *colloids*).

gasometer. (1) An instrument for measuring the quantity of gas flowing through it. (2) A gas-holder.

gasometric. Pertaining to the analysis of gases.

gasometry. Gasometric analysis, gas analysis. The examination and qualitative and quantitative analysis of gases.

gassed. Overcome by noxious gas.

gassing. (1) In agriculture the gassing of plants, *e.g.*, the use of carbon dioxide as a fertilizer, or of a poison gas for destroying animal pests or weed eradication. (2) In warfare, the use of poison gas (q.v.) as a measure of attack or defense.

Gassner cell. A voltaic dry cell (1.3 volt), consisting of a zinc and carbon electrode in a mixture of 1 pt. zinc oxide, 1 part ammonium chloride, 3 parts calcium sulfate, 2 parts zinc chloride moistened with water to form a paste.

gastric. Pertaining to the stomach. **g. content.** Semi-digested food mixed with digestive enzymes. Analysis: (1) Macroscopic: Amount, color, odor, appearance, food-remnants. (2) Microscopic: Blood cells, pus cells, starch cells, mucus shreds and sarcinae. (3) Chemical: Total acidity, free hydrochloric acid, free organic acids, total free acids, combined hydrochloric acid, combined organic acids, lactic acid, pepsin, peptone, occult blood. **g. digestion.** The decomposition of food-materials in the stomach; chiefly the hydrolysis of proteins by pepsin with hydrochloric acid as activator. **g. juice.** The secretions of the stomach glands, containing the digestive ferments and enzymes. **g. tonic.** A drug which improves or stimulates digestion.

gastrin. A gastric hormone, *i.e.*, a substance in the gastric mucous membrane which excites the secretion of gastric juice.

Gattermann, Ludwig. 1860–1920. A German organic chemist, noted for laboratory methods.

gauchamacine. *Guachamacine.*

gauge. Gage.

gaultheria. The dried leaves of *Gaultheria procumbens*, wintergreen, partridge berry or checker berry, an Ericaceae of North America; used as a stimulating tea. **g. oil.** Wintergreen oil.

gaultheric acid. Methylsalicylate.

gaultherilene. $C_{10}H_{16}$ = 136.2. A terpene in wintergreen oil.

gaultherin. $C_{14}H_8O_8$ = 314.4. Monotropitoside. A glucoside from the bark of *Betula lenta* or black birch. It hydrolyses to methyl salicylate and glucose.

gaultherolin. Methyl salicylate.

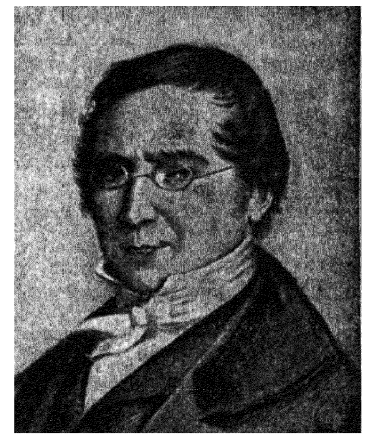
Gauss, Karl Friedrich. 1777–1855. A German mathematician who developed the conception of the three fundamental units: length, mass and time.

gauss. H. The unit of intensity of a magnetic field (field strength): A magnetic field which exerts a force of one dyne on a unit magnetic pole: 1 gauss (E.M.U.) = $\frac{1}{3} \times 10^{-10}$ e.s.u. For small measurements: 1 γ = 0.00001 gauss.

Gautier receiver. A glass apparatus for collecting different samples from the same condenser during distillation (q.v.) in a vacuum.

gauze. A light, loosely-woven fabric, or fine wire netting. **g. top.** A piece of g. attached to the top of a bunsen **burner** to prevent the **flame** from striking back.

Gay-Lussac, Joseph Louis. 1778–1850. A French chemist and physicist noted for the formulation of the gas laws; inventing volumetric methods, and many scientific and industrial devices; isolating boron. **G. hydrometer.** A hydrometer used for alcoholic liquids and graduated in percentages. **G. law.** When



Joseph Louis Gay-Lussac.

(From McPherson and Henderson "First Course in Chemistry." Courtesy of Ginn & Co.)

gases intereact the volumes of the reacting gases and the volume of the reaction product are in simple proportions, and can be expressed by whole numbers. **G. tower.** A tower used in the chamber process for the manufacture of sulphuric acid to absorb the oxides of nitrogen in the crude acid produced.

gaylussite. $Na_2Ca(CO_3)_2.H_2O$ = 224.03. A natural sodium-calcium carbonate.

gazogene. A fuel gas made by burning charcoal.

Gd. The symbol for gadolinium.

Ge. The symbol for germanium.

Geber. Abu Abdallah Jaber. An Arabian alchemist and writer living in about the 9th century, noted as the discoverer of sulfuric and nitric acid. The Latin writings attributed to him (which may be of a later date), also contain speculations on the alchemical "elements."

gedanite. A fossil resin resembling amber.

gedrite. A variety of anthophyllite containing alumina.

gee-lb. Slug.

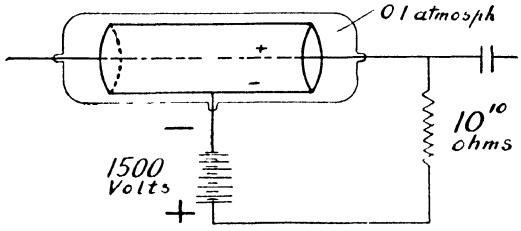
gehlenite. $Ca_3Al_2Si_2O_{10}$. A greenish, resinous, tetragonal calcium aluminum silicate, d.2.9–3, hardness 5.5–6.

geic acid. Ulmic acid.

Geiger counter tube. A fine wire, axially placed in a metallic cylinder under a gas pressure of about 5 cm Hg; used for detecting and counting electrons.

Geiger-Müller counter. A metallic cylinder, charged negatively, in a vacuum tube (0.1 atm.), having in its center a fine wire positively charged. A radiation producing a negative ion will cause it to move towards the wire, and by encountering and colliding with gas molecules it will successively ionize them, thus causing an avalanche

of ions on the wire which can be detected by electrical amplification (see figure)



Geiger-Müller counter

geikielite. Ilmenite

geissine $C_{19}H_{24}O_2N_2 \cdot H_2O$ = 330 3 Geissospermine An alkaloid from the bark of *Geissospermum laeve* or pereira bark, an Apocynaceae of Brazil

Geissler, Heinrich. 1814–1879 A German physicist who determined the coefficient of expansion of water and experimented with tubes, now called Geissler tubes **g bulb** A potash bulb **G tube.** A sealed and partly evacuated glass tube of varied shape, used in the study of electric discharges through gases and for spectroscopic examinations

geissospermine Geissine

gel. (1) Jel A jelly, or the solid phase of a colloidal solution, as opposed to sol, the liquid phase It consists of a colloidal solution of a liquid in a solid (2) To form a gel or jelly Cf *coagel, swelling, thixotropy, zone* **alco-** A solid colloidal solution in alcohol **hydro-** A solid colloidal solution in water **irreversible-** A gel that cannot be converted into a sol **reversible-** A gel that becomes a liquid sol on heating or by other treatment, and gels or solidifies again on cooling **silica-** See *silica*

gelate Gelatinise To cause the solidification of a colloidal solution

gelatification Conversion into gelatin

gelatin An albumin from animal tissues (bones, ligaments and skin), obtained by boiling them under pressure with water It occurs as white or yellowish films, insoluble in cold water but which soften and swell when immersed in it, insoluble in alcohol or chloroform, soluble in hot water, acetic acid, or glycerin, and coagulated by tannin, chlorine, bromine, or mercury salts, and hardened by formaldehyde Composition

	C	H	N
Commercial gelatin	49 38 %	6 81 %	17 97 %
ligament gelatin	50 49 %	6 71 %	17 90 %
tendon gelatin	50 11 %	6 56 %	17 81 %
		S	O
Commercial gelatin		0 71 %	25 13 %
ligament gelatin		0 57 %	24 33 %
tendon gelatin		0 26 %	25 24 %

The formulae $C_{76}H_{124}O_{29}N_{24}S$ and $C_{102}H_{151}O_{31}N_{30}$ have been proposed G is an amphoteric compound which combines with cations to form "gelatinates," and with anions to form "gelatin-salts"

1 nonionized (iso-electric) pH 4 7
2 ionized (*e g* with sodium chloride)
A Metal-gelatinate (*e g* sodium gelatinate) pH < 4 7
B Gelatin-salt (*e g* gelatin chloride) pH > 4 7

Gelatin is used as a nutrient, medicinally as a hemostatic, pharmaceutically as an excipient, in bacteriology as a culture medium, technically for photographic papers, films and plates, and in glues, as a clarifying agent in many processes (brewing, etc), as adhesive, sizing or stiffening agent and colloidal protector Cf *isinglass, agar, glue* **ana-** One of the two constituents of gelatin, soluble or insoluble ana-gelatin, which, when present in the correct proportions produce a gel **animal-** Gelatin **bone-** Gelatin prepared from bones **chinese-** Vegetable- **chromatized-** A mixture of 5 parts of a 10 % gelatin solution and one part potassium dichromate **formalin-** Glutolin **glycerinated-** A mixture of equal parts of glycerol and gelatin **Japanese-** Agar-agar **nitro-** A mixture of nitroglycerin and nitrocellulose Cf *dynamite, gelignite* **plain-** A culture medium which consists of 100 gm gelatin, 10 gm peptone, and 5 gm sodium chloride in 1000 cc bouillon stock solution and neutralized with NaOH **silk-** Sericin **vegetable-** A gelatinous substance obtained from various vegetable tissues, as, agar

g culture A bacterial culture grown on a medium containing gelatin, as, pure g , glucose g **g discs** A small disc of medicated gelatin used for the application of drugs to the eye **g sugar** Glycocoll

gelatinate A compound of gelatin, (q v), with a positive ion or radical

gelatinize (1) To gelate (2) To convert into gelatin

gelatinous Jelly-like or resembling gelatin

gelation The formation of a gel, q v **con-** See *congelation* **re-** See *regelation*

gelignite Blasting gelatin, gelatin dynamite An explosive consisting of nitroglycerin, nitrocellulose, potassium nitrate and wood-meal Cf nitro*gelatin*

gelling point The setting point (concentration and temperature) at which semi-liquids or pastes become solid

gelose Galactan

gelsemic acid Scopoletin

gelsemin $C_{49}H_{63}N_5O_{14}$ = 945 9 A resinous substance from the rhizome of *Gelsemium sempervirens* A yellowish-brown powder, insoluble in water, soluble in alcohol, used medicinally as an antipyretic

gelsemine $C_{22}H_{26}O_3N_2$ = 366 22 An alkaloid from the roots of *Gelsemium sempervirens* A white, amorphous powder, m 160, insoluble in water, soluble in alcohol, ether, or chloroform, used medicinally as an analgesic and antispasmodic

gelseminic acid Scopoletin $C_{10}H_8O_4$ = 192 1 The monomethylether of esculetin 4-methoxy-5-hydroxycoumarin, m 204

gelseminine $C_{42}H_{47}O_{14}N_3$ = 819 6 An alkaloid from the roots of *Gelsemium sempervirens*, yellow jassamine or Carolina jasmine, a Loganiaceae of North America Colorless crystals, insoluble in water, soluble in alcohol, ether or chloroform, used medicinally as an antipyretic, antineuralgic, and antispasmodic **g hydrobromide** $C_{42}H_{47}O_{14}N_3 \cdot HBr$ = 900 53 Colorless crystals, soluble in water or alcohol, used as gelseminine **g hydrochloride** $C_{42}H_{47}O_{14}N_3 \cdot HCl$ = 856 07 Colorless crystals, soluble in water or alcohol **g nitrate** $C_{42}H_{47}O_{14}N_3 \cdot HNO_3$ = 881 61 Colorless crystals, soluble in water or alcohol

Gelsemium. (1) A genus of loganiaceous (de Candolle), apocynaceous (Decaisne) or rubia-

ceous (Chapman) plants (2) Yellow jasmine root The dried rhizome and roots of *Gelsemium sempervirens* a Loganiaceae, used medicinally as a nerve sedative, antispasmodic and antineuralgic

gelsemoid The combined principles from the root of *Gelsemium sempervirens*, used medicinally as an antispasmodic

gem (1) A precious stone (2) *gem-* A prefix indicating in a disubstituted compound that the radicals, R′, are both on the same carbon atom, R CR_2' **artificial-, synthetic-** A precious stone made by a chemical process, *e g* , ruby

gemmatin $C_{17}H_{12}O_7$ = 328 08 A coloring matter from the fungus, *Lycoperdon gemmatum*

-gen A suffix meaning to produce or bear, as, hydrogen, oxygen

genalkaloids An alkaloid in which the amino group has been converted into an amino-oxy group They have the same therapeutic effect but are less toxic than the parent alkaloid

gene A supermolecule or micelle of proteins, considered to be the unit of heredity, which surrounded by colloidal matter, forms the chromomere, the latter, banded together, being the chromosome (In the tiger lily there are 2200 genes per chromosome)

genease Maltase

generate To produce or make a gas or an electric current

generator An apparatus for manufacturing gases, as, Kipp's g

generator gas A fuel gas obtained by blowing air through layers of heated coal or coke It consists chiefly of CO and CO_2

generic test The reactions of organic compounds which determines their place in Mulliken's classification of organic compounds

Geneva nomenclature A system of naming carbon compounds recommended by the Geneva Convention for general and international use See *organic compounds, nomenclature*

genistein $C_{15}H_{10}O_5$ = 270 08 Prunetol, 4′ 5 7-trihydroxyisoflavone A flavone (q v) from various plants, the aglucone of genistin

genistin $C_{21}H_{20}O_{10}$ = 432 15 A glucoside, m - 254, from soy-bean meal Cf *plant-pigments*

genoline oil Linseed oil polymerised by boiling, used as a lithographic varnish

gentaric acid $C_7H_{10}O_6$ = 190 08 Methane triacetic acid $CH(CH_2COOH)_3$

genthite Nickel gymnite

gentian Gentian root The dried rhizome and roots of *Gentiana lutea*, a Gentianaceae, used medicinally as a bitter tonic and stomachic See *aromatin*

gentianviolet The hydrochloride, sulfate, or nitrate of triphenyl-rosaniline and triphenyl-pararosaniline Grayish-green or bluish powder, soluble in water or alcohol Used as a stain, and as a disinfectant in tonsillitis

Gentianaceæ Gentian family, a group of herbs with a colorless, bitter juice, containing little or no tannin The following are drugs

roots	
Gentiana lutea	gentian
Frasera walteri	American calumba
Tachia guianensis	tachia
herbs	
Swertia chirayita	chirata
Centaurium centaurea	centaury
Sabbatia paniculata	sabbatia
Menyanthes trifoliata	menyanthe

gentianic acid Gentisinic acid

gentianin (1) An extract containing the bitter principle of the root of *Gentiana* species (2) Gentisin

gentianite $C_{16}H_{32}O_{16}$ = 480 3 A carbohydrate found in the root of *Gentiana* species

gentianose $C_{18}H_{32}O_{16}$ = 504 25 A trisaccharide, $[\alpha]_D$ +31°, from gentian, which yields 2 molecules glucose and one molecule fructose

gentienin $C_{14}H_{10}O_5$ = 258 1 An isomer of gentisin, m 225

gentiin $C_{25}H_{28}O_{14}$ = 552 2 A glucoside from *Gentiana* species, m 274

gentiobiose $C_{12}H_{22}O_{11}$ = 342 17 A disaccharide, $[\alpha]_D$ +9 6°, from the hydrolysis of starch Isomaltose, glucose-β-glucoside

gentiogenin $C_{14}H_{16}O_5$ = 264 2 A split-product of gentiopicrin

gentiopicrin $C_{16}H_{20}O_9$ = 356 2 A glucoside from the root of *Gentiana* species Yellowish crystals, m 191, soluble in water

gentisaldehyde $C_7H_6O_3$ = 138 05 *2 5*-Dihydroxybenzene carbonal*, *2 5*-dihydroxybenzaldehyde $(HO_2)C_6H_3CHO$ Cf *protocatechualdehyde, resorcylaldehyde*

gentisein $C_{13}H_8O_5$ = 244 1 1 3 7-trihydroxyxanthone Colorless crystals, m 315

gentisic acid $C_7H_6O_4$ = 154 1 Hydroquinone carboxylic acid, 2 5-dihydroxybenzoic acid, gentisinic acid, gentianic acid, 5-hydroxysalicylic acid Colorless crystals, m 200, soluble in water or alcohol

gentisin $C_{14}H_{10}O_5$ = 258 1 Gentianin, 1-methoxy-3 7-dihydroxyxanthone The yellow pigment of the root of *Gentiana* species Yellow needles, m 267, sublimes and decomp at 400°C , slightly soluble in water, soluble in alcohol or ether **iso-** 7-Methoxy-1 3 dihydroxyxanthone

gentisin alcohol $C_7H_8O_3$ = 140 1 2 5-dihydroxytoluyl-alcohol A colorless liquid **dimethyl-** $C_9H_{12}O_3$ = 168 1 2 5-dimethoxytoluyl alcohol A colorless liquid, b 278

gentisinic acid Gentisic acid

genus (1) A group of related organic compounds in Mulliken's classification (2) A group of related species of plants or animals

geocerinic acid $C_{28}H_{56}O_2$ = 424 5 An unsaturated aliphatic acid obtained from lignite

geocerinone. $C_{27}H_{57}CO\,C_{27}H_{57}$ = 791 1 An unsaturated, aliphatic ketone obtained from lignite Colorless crystals, soluble in water or alcohol

geochemistry A branch of geology which deals with the chemical changes occurring on the earth's crust, by which its composition is altered

geocoronium A hypothetical element assumed to exist in the upper layers of the atmosphere.

geocronite $Pb_5Sb_2S_8$ or $5PbS\,Sb_2S_3$ A grayish, metallic, rhombic lead antimony sulfide, d 6 4–6 5, hardness 2–3

geodesy The science of the form and dimensions of the earth and its surroundings

geodynamics The active phase of geology, or a study of the forces and causes which change the earth surface Cf *geomorphology*

geoffrayin Rhatanin

Geoffroy, Claude Joseph 1685–1752 A French apothecary who determined the constitution of borax, salmiac and other salts **G , Etienne Francois** 1672–1731 A French physician and teacher of chemistry, noted for his theory of affinity

geologic Pertaining to geology

GEOLOGIC ERA

ERA PERIOD AND SYSTEM EPOCH AND SERIES	*Time* estimated in millions of years			*Rock-types*, Maximum known thickness in 1000 ft		
	era	period	epoch	era	system	series
CENOZOIC ERA	60			70		
Quaternary period and system		1–1 5			4	
Tertiary period and system		54–63			66	
Pliocene epoch and series			6 –7 5			10
Miocene epoch and series			12–14			21
Oligocene epoch and series			16			12
Locene epoch and series			20–26			23
MESOZOIC ERA	150			75		
Cretaceous period and system		65–85			46	
Upper cretaceous epoch and series			40–50			20
Lower cretaceous epoch and series			25–35			26
Jurassic period and system		35–45			15	
Triassic period and system		35–45			13	
PALEOZOIC ERA	420			161		
Carboniferous period and system		100–140			52	
Permian epoch and series			25–40			13
Pennsylvanian epoch and series			35–50			24
Mississippian epoch and series			40–50			15
Devonian period and system		50			37	
Silurian period and system		40			15	
Ordovician period and system		90–130			13	
Cambrian period and system		70–110			40	
PROTEROZOIC ERA	850			180		
Algonkian period and system		?			82	
Keweenawan epoch and series			?			50
Huronian epoch and series			?			32
Archean period and system		?			94	

geologic era The periods during which certain rock strata were formed on the earth s surface Accordingly the earth's physical history is divided into *eras* subdivided into *periods* and again divided into still smaller units called *epochs* The rocks formed during a period constitute a geologic *system* those formed during an epoch constitute a *series* which are again subdivided into *formations* many of them characterized by the remains of vegetable and animal life Hence we speak of the quaternary period and the quaternary system but the pliocene epoch and the pliocene series (See table adapted from Bulletin No 769 U S Geologic Survey Washington 1926)

geology The science of the physical history of the earth and the structure of the earth surface **dynamic-** The study of the agencies which cause geological changes **economic-** The study of the occurrence and formation of economically important minerals ores or stones **eolic-** The study of the changes produced by wind **historical-** The study of the successive development of rock formations **palaeantologic-** The study of the remains of animal and vegetable life and their relation to rock formations **stratigraphic-** Historical- **structural-** The study of the formation, arrangement and aggregation of rocks on the earth surface

geometric(al) Pertaining to or determined by the principles of geometry **g conversion** The change from one g isomer to another as elaic acid to oleic acid or maleic acid to fumaric acid **g isomer** An optically inactive compound which exists in two or more geometrically different atomic arrangements as cis- and trans-form syn- and anti-form **g isomerism** Describing isomeric organic compounds characterized by a double bond in which the molecules differ by a geometrically different spacial arrangement of the atoms but which are optically inactive, as

R R	R' R
‖	‖
C X	C X
syn-	anti-
cis-	trans-

g progression A series of numbers related by a constant ratio between successive terms For instance the number of possible peptides from 1 2 3 amino acids are

1 amino acid	1 compound
2 a a = 2 × 1 or	2 compounds
3 a a = 3 × 2	6 compounds
4 a a = 4 × 6	24 compounds
5 a a = 5 × 24	120 compounds
6 a a = 6 × 120	720 compounds

geomorphology The passive phase of geology or a study of the form of the earth surface Cf *geodynamics*

georhetinic acid $C_{35}H_{40}O_{31}$ = 836 4 A resin from lignite

geosote Guaiacol valerate A compound of guaiacol and valeric acid used as an antiseptic

geranene $C_{10}H_{18}$ = 136 2 A liquid hydrocarbon derived from geraniol

geranial Citral

geranic acid $C_{10}H_{16}O_2$ = 168 2 *3 7*-Dimethyl-*2 6*-octadienoic acid* A monobasic acid and the oxidation product of citral or geraniol An oily liquid d 0 952 b_{20mm} 119 iso- Colorless crystals m 103, b_{11mm} 138

geraniol $C_{10}H_{18}O$ = 154 20 An unsaturated alcohol $Me_2C{=}CH\ CH_2\ CH_2\ CMe{=}CH\ CH_2{\cdot}OH$ a constituent of the oils of geranium roses eucalyptus citronella lavender and ylang A colorless liquid d 0 881 b 231 insoluble in water miscible with alcohol or ether used as insect bait Cf *ylangol, geranyl* **dihydro-** Citronellol

geranium Cranesbill The dried rhizome of *Geranium maculatum* used medicinally as an intestinal astringent **g oil** The essential oil from the leaves of *Pelargonium* species occurring in many grades d 0 889–0 906, and containing geranial citronellol phellandrene and tiglates *Turkish-* Palmarosa oil The essential oil of *Andropogon (Cymbogen) martini* a Geraniaceae containing 70 % geraniol

geranyl The monovalent $C_{10}H_{17}$— radical derived from geraniol **g. acetate** $CH_3COO{\cdot}C_{10}H_{17}$ = 196 22 Geraniol acetate A colorless liquid d 0 915 decomp 245 slightly soluble in water or alcohol, miscible with ether **g chloride** $C_{10}H_{17}Cl$ = 172 6 A colorless liquid soluble in alcohol

Gerhardt, Charles Friederich 1816–1856 A French chemist who formulated the concept of homologous and heterologous series among organic compounds **G test** A test for diacetic acid in urine by means of ferric chloride solution

gerhardtite A native basic copper nitrate

germ (1) A primitive embryo or embryonic cell (*2*) A bacterium microbe or spore

german silver Nickel silver A white alloy of copper (60) nickel (30) and zinc (30) used in resistance coils and for cutlery

germane GeH_4 = 76 63 Germanium hydride A colorless gas burning with a blue flame d_{-142} 1 523 m −165, b −90 **di-** Ge_2H_6 = 150 81 Germanoethane A gas d_{-109} 1 98 m −109 b 29 Cf *germanium ethide* **tri-** Ge_3H_8 = 225 20 Germanopropane A liquid d 2 20, m −105 b 110

germanate A salt of the type M_2GeO_3 derived from germanium dioxide **thio-** A salt of the type M_2GeS_3 derived from germanium disulfide

germander Chasse fievre The herb of *Teucrium chamaedrys* a Labiatae used as tonic diuretic and for gout **water-** Wood garlic, English treacle The herb of *T scordium*, used as antiseptic and stimulant

germanic A compound of tetravalent germanium Ge≡ **g chloride** Germanium tetrachloride **g oxide** Germanium dioxide

germanin Bayer 205 naganol suramin The sodium salt of 3 3′-ureidobis [8-(3-benzamido-p-toluido)-1 2 5-naphthalenetrisulfonic acid] A colorless readily soluble substance, used as a specific in the treatment of sleeping sickness in man or animals

germanite A copper mineral from Tsumeb, S W Africa which contains 6–8 % Ge and 1 % Ga

germanium Ge = 72 60 Atomic number 32 A metallic element of the carbon family d 5 496, m 958 b 1300 insoluble in water acids or alkalis It was discovered in 1886 by Winkler in argyrodite after being previously predicted in 1871 by Mendeleeff (ekasilicon) Germanium is a very rare metal, occurring in any quantity only in argyrodite euxenite and germanite Its valency is two or four hence it gives rise to the compounds

+2 germanous	Ge^{++}
+4 germanic	Ge^{++++}

Ge is at present little used but it has great possibilities it gives strength to aluminum alloys greater hardness to magnesium alloys and higher refractive power to glass

g alkyls A group of organo-metallic compounds in which tetravalent germanium replaces carbon *e g* germanium ethide **g chloride** See *g tetrachloride* or *g dichloride* **g chloroform** $GeHCl_3$ = 179 4 A colorless liquid, b 72 decomp by water soluble in hydrochloric acid **g dichloride** $GeCl_2$ = 143 4 Germanous chloride A colorless liquid **g dibromide** $GeBr_2$ = 232 46 Germanous bromide Colorless crystals decomp on heating **g diiodide** GeI_2 = 326 46 Yellow crystals **g dioxide** GeO_2 = 104 5 G oxide germanic oxide A white powder $d_{18°}$ 4 703 m 1025 slightly soluble in water soluble in acids used in the treatment of pernicious anemia **g disulfide** GeS_2 = 136 6 G sulfide germanic sulfide A white powder decomp on heating or by water soluble in alkalis **g ethide** $GeEt_4$ or $C_8H_{20}Ge$ = 188 5 Germanium tetra-ethyl A colorless liquid b 160 **g hydride** Germane **g hydroxide** $Ge(OH)_2$ = 106 6 A yellow powder, insoluble in water soluble in alkalis Cf *germanoformic acid* **g iodide** See *g tetraiodide* **g monosulfide** GeS = 104 5 Germanous sulfide Dark brown thin plates of metallic luster soluble in alkalis **g monoxide** GeO = 88 5 Germanous oxide A dark gray volatile powder soluble in HCl **g oxide** See *g dioxide* or *g monoxide* **g sulfide** See *g disulfide* or *g monosulfide* **g tetrabromide** $GeBr_4$ = 392 31 Germanic bromide A colorless fuming liquid d 3 13 m 26 1 b 185 9 **g tetrachloride** $GeCl_4$ = 214 4 G chloride germanic chloride A colorless fuming liquid d_{18} 1 887 m −49 5 b 86 decomp by water to a hydrated germanium dioxide **g tetraethyl** G ethide **g tetrafluoride** GeF_4 = 148 6 Germanic fluoride Colorless hygroscopic crystals $GeF_4{\cdot}3H_2O$, readily soluble in water **g tetraiodide** GeI_4 = 580 2 G iodide germanic iodide A red crystalline powder d 4 32 m 144 b 355, decomp by water soluble in dilute acids

germanoformic acid H GeOOH A tautomer of germanium hydroxide obtained by heating $Ge(OH)_2$ with alkali It is a red powder and a reducing agent

germanous The compounds of divalent germanium Ge— which are generally less stable than the germanic compounds **g chloride** Germanium dichloride **g oxide** Germanium monoxide **g sulfide** Germanium monosulfide

germicidal Destructive to microorganisms or germs

germicide An agent that destroys microorganisms applied especially to agents that kill disease germs cf *disinfectant* Their strength is measured by the Salle index the ratio a/b where a is the germ-killing power and b the tissue destroying effect Values

iodine trichloride	0.04
iodine	0.09
hexylresorcinol	3.0
metaphen	12.7
phenol	12.9
pot. merc. iodide	13.3
merthiolate	35.3
mercurochrome	262.0

Cf. *Rideal-Walker test.*

germination. The sprouting of a seed or spore.

germinator. A device to determine the germinating power of barley or other seeds; it consists of a perforated disc holding a certain number of seeds, supported over water, and kept at a definite temperature.

geronic acid. $C_9H_{16}O_3$ = 172.10. *2*-Dimethyl-*6*-ketoheptoic acid. An oxidation product of β-carotene and β-ionone.

gerontin. $C_5H_{14}N_2$ = 102.1. A leukomaine from dog's liver.

gerontology. The study of diseases of the aged.

gersdorffite. (Ni,Fe)AsS or NiS_2,$NiAs_2$. Plessite. A native, metallic, grayish nickel-iron sulfarsenide, d.5.2–6.3, hardness 5.5, soluble in nitric acid.

Geryk pump. A vacuum pump. Cf. *Guericke.*

gesnerin. The *5*-glucoside of *4'.5.7*-trihydroxyflavylium chloride. An anthocyanin from the orange flowers of *Gesneria* species.

gesso. A plaster made of whiting and glue, and found on objects from ancient Egyptian monuments.

gestalt. Showing properties other than can be derived from the individual constituents by summation.

getter. (1) A substance which "cleans" gases, such as, O, N, H_2O etc., from vacuum tubes, such as, radio valves, transmitting tubes, rectifiers. **absorptive-** or **chemical-** A g. which reacts with the gas; as, Li, Mg and Ca. **adsorptive-** or **physical-** A g. which binds gases on its surface, as zirconium. (2) A metal, e.g., thallium, used to coat the filament of a tungsten lamp and so to prolong its life.

geyserite. A sinter produced near geysers, consisting essentially of hydrous silicic acid.

ghatti gum. Indian gum.

ghee. Indian butter fat. A butter-like substance from the seeds of *Bassia butyraceae,* used for soap making and edible purposes. **Phalka-** An oil from the seeds of various *Bassia* species, used to adulterate ghee.

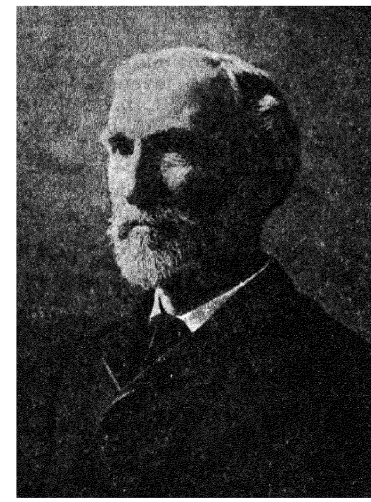
ghetta acid. $C_{34}H_{68}O_2$ = 508.54. A fatty acid from ghedda, an East Indian wax.

giallioline. Lead antimoniate.

Gibbs, Josiah Willard. 1839–1903. An American mathematician and physicist noted for the development of the phase rule (q.v.) and thermodynamics. **G. function.** Thermodynamic potential. **G.-Helmholtz equation.** The relationship between the chemical energy transformed and the maximum energy obtainable electrically in a reversible galvanic element.

$$E = \frac{Q}{nF} + T\frac{dE}{dT}$$

where E is the E.M.F. of the cell, Q the heat equivalent of the chemical change for molar quantities, expressed in electrical units, F 96,540 coulombs, T the absolute temperature at which the cell is working, and n the valency, or the number of charges carried by a mol of the substances undergoing change; dE/dT is the rate of change in E.M.F. of the cell with temperature. **G. paradox.** Work is obtainable when 2 gases of thermodynamically identical physical properties (*e.g.,* N_2 and CO) are mixed,



siah Willard Gibbs.

but not when 2 portions of the mixed. **G. phase rule.** See *phase rue.*

Gibbs, Oliver Wolcott. 1822–1908. An American chemist noted for his work on cobaltammines, complex acids and platinum compounds.

gibbsite. $Al_2O_3(H_2O)_3$. A native aluminum hydroxide.

Giemsa, Gustav. 1867– . A German chemotherapist noted for laboratory methods. **G. stain.** A microscope staining solution for white blood corpuscles, consisting of 0.3 gm. azur II eosin, 0.8 gm. azur II, 250 gm. glycerin, and 250 cc. methanol. **G. ultra filter.** A device for sterilizing and filtering small quantities of biological liquids through a collodion membrane.

gigantolite. A pseudomorphic alteration of iolite.

Gilbert, Sir Joseph Henry. 1817–1901. An English chemist noted for agricultural research, and the formulation of the nitrogen theory.

G., Ludwig Wilhelm. 1769–1824. A German chemist, and editor of *Annalen der Physik.*

G., William. 1540–1603. An English natural philosopher, physician to Queen Elizabeth and a pioneer in magnetism and electricity.

gilbert. An obsolete unit of magnetic quantity.
1 gilbert = 0.7956 ampère-turn.
1 International gilbert = 0.99991 absolute gilberts.
1 absolute gilbert = 1.00009 international gilberts.

Gilead balm. Balm of Gilead, Mecca balsam. An oleoresin from *Balsamodendron gileadense,* a Burseraceae. Cf. *poplar buds.*

Giles flask. A volumetric flask with long neck, graduated at x and at $\left(x + \frac{x}{10}\right)$ of its volume; *e.g.,* at 500 cc. and 550 cc. Used in preparing normal solutions.

gill. A liquid measure: 1 gill = 4 fluid ounces = 118.29 cc. = 0.25 pint.

gillenia Indian physic, American ipecac The root bark of *G trifoliata* or *G stipulacea*, a Rosaceae, used as an emetic and cathartic

gilsonite Uintaite A black, brittle, lustrous mineral consisting of hydrocarbons

Giltner tube A tube for anaerobic cultures

gin An alcoholic beverage made by distillation of a fermented extract of grain in the presence of Juniper leaves **artificial-** Fancy g to which flavoring essences have been added **fancy-** A mixture of g and neutral alcohol

ginger Zingiber The dried rhizome of *Zingiber officinalis*, a Scitaminaceae of Asia, West Indies, and Africa, used medicinally as an aromatic and stimulant **black-** The crude drug having a black skin **jamaica-** The yellowish white roots, from which the skin has been removed **wild-** Asarum

g oil The essential oil of g , d 0 882–0 900, b 155–300, containing phellandrene and zingiberene

gingerin An oleoresin derived from ginger

gingerol An essential oil derived from ginger

ginkgoic acid $C_{24}H_{48}O_2$ = 368 5 An unsaturated acid from the fruit of *Ginkgo biloba*

ginning The removal of the larger seed hairs from the cotton plant Cf *cotton, linter*

ginseng Panax The dried roots of *Panax quinquefolium*, an Aralia species, used medicinally as a tonic and demulcent

Girard reagents Quaternary ammonium compounds of the type $Me_3N(Cl)\ CH_2CONH\ NH_2$, which form soluble compounds with substances containing CO groups, these may subsequently be regenerated Used to separate sex hormones from urine

gismondine Gismondite

gismondite $CaAl_2Si_4O_{12}$ Gismondine, abrazite A white or grayish, hydrated lustrous, monoclinic zeolite, d 2 4, hardness 5–5 5

gitalin $C_{28}H_{48}O_{10}$ = 544 37 A glucoside, m- 253, from digitalis leaves

githagenin $C_{28}H_{44}O_4$ = 444 4 The aglycone of **githagin** A saponin from corn cockle, *Agrostemma githago*, which hydrolyses to githagenin and glucuronic acid

gitogenic Having a digitalis-like effect, or the structure of digitalis aglucones See *cholane derivatives*

gitoxigenin $C_{24}H_{36}O_5$ = 404 3 A split-product of gitoxin

gitoxin A glucoside from the leaves of digitalis, it hydrolyses to 1 mol gitoxigenin and 3 mol digitoxose

glacial Describing a compound of ice-like, crystalline appearance, especially the solid form of a liquid compound, as glacial acetic acid

Gladstone, John Hall 1827–1902 An English chemist who investigated the optical constants of compounds, and electrical storage batteries

gladwin The root of *Iris foetidissima*, used as an antispasmodic

glance The general term for minerals with a glassy luster, *e g* , lead glance, galena

gland An organ that separates a specific substance (waste product) from the blood, or which secretes specific substances (*e g* , enzymes)

glandula A group of therapeutic preparations consisting of dried glands

glanzstoff See *rayon*

Glaser furnace A combustion furnace used for organic elementary analysis

glaserite $Na_2SO_4\ 3K_2SO_4$ Aphthitalite, arcanite A colorless, vitreous potassium-sodium sulfate, d 2 6, hardness 3–3 5, occurring at Stassfurt

glass An amorphous, hard, brittle, often transparent material consisting of a mixture of the silicates of the alkali and alkaline earth or heavy metals It is obtained by the solidification of a fused mass containing

A SiO_2 as quartz, flint pebbles or siliceous sand, this can be replaced by B_2O_3, Al_2O_3, or Mn_2O_3

B Na_2O or K_2O as carbonate or sulfate, and coal

C CaO as limestone or marble, this may be replaced by PbO, MgO, ZnO, or BaO

The constituents, A, B, and C, are finely powdered, well mixed and heated to 1000–1100°C , on cooling to 890°C the pasty glass is worked by blowing, drawing, casting, or fusing piece to piece, and then annealed by slow cooling or by reheating and cooling The composition of glass varies between $(K,Na)_2O,(Ca,Pb)O,6SiO_2$ and $5(K,Na)_2O,7(Ca,Pb)O,36SiO_2$, and the following formula has been ascribed to it $(K, Na)O—Si_nO_{2n-1}O(Ca, Pb)O\text{-}Si_n\ O_{2n-1}—O(K, Na)$ According to the predominating constituents glass is classified into

(1) Potash-lime glass—hard, not soluble and resistant to water and acids, d 2 4, generally used for chemical glassware

(2) Soda-lime glass—more fusible and less resistant, d 2 65, used for ordinary window glass or venetian glass Average composition 18 58 % Na_2O, 5 06 % CaO, 73 4 % SiO_2

(3) Potash-lead glass—readily fusible and highly refractive, as crystal glass, d 2 9–3 6, flint glass, d 3 3–3 6, consisting of 13 88 % K_2O, 32 95 % PbO, and 53 17 % SiO_2, paste for artificial gems and lenses, crown glass (containing BaO) d 1 5–1 56

(4) Bottle glass consisting of Na, K, Ca, and Al silicates, d 2 73

(5) Opaque glass—a glass made opaque by the addition of $BaSO_4$, smalts, or bone-ash

(6) Colored glass—a glass colored by the addition of metallic oxides, as

yellow—antimony, iron, silver or uranium,
red—gold chloride, ochre, cuprous oxide or selenium,
green—ferrous sulfate, copper or chromium oxide,
blue—cobalt oxide or traces of copper,
iridescent—the vapors of metallic chlorides on the hot glass,
nacreous—by the addition of scales of mica

		Window (%)	Flint (%)	Bottle (%)	Pyrex (%)
(A)	SiO_2	71 5	54	74	80 6
	Al_2O_3	1 5		0 5	2 6
	B_2O_3				11 9
(B)	Na_2O	14 0		17	4 4
	K_2O		10		
(C)	CaO	13 0		5	1 1
	PbO		36		
	MgO			3 5	

blown- A glass which is blown into shape **Bohemian-** Potash glass **borax-** A glass with a low expansion coefficient, which contains borax **boro-silicate-** An optical glass containing lead boro-silicate **bottle-** A glass which is blown into shape in a mold **bullet-proof-** A series of plate-glass sheets cemented together in layers by a transparent medium **canary-** Uranium- **cast-** Plate- **chemical-** An acid- or alkali-resistant glass used for chemical apparatus **chromium-** A glass colored yellow by chromium compounds **clock-** A circular piece of glass similar in shape to that used for covering clock faces, used to cover beakers etc , and may contain a hole to take a rod **cobalt-** A glass colored purple-blue by cobalt compounds, used as a light filter in analytical chemistry **copper-** A glass colored blue or red by copper compounds **cover-** A thin glass square used to cover microscope specimens on the slide **crown-** A hard optical glass consisting of a silicate of sodium with calcium and aluminum oxides **cryolite-** Milk- **crystal-** Flint- **electric bulb-** A lime glass used for electric bulbs **flint-** A soft optical glass consisting of potassium and lead silicates **frosted-** A glass having a roughened surface **iron-** A glass colored yellow, olive-green, or pale blue by iron compounds **jena-** A group of optical and heat-resisting glasses made at Jena **laminated-** Safety g G made by cementing thin sheets of g together with a plastic at 200–260°F and 250–350 pounds pressure per square inch It may crack but will not splinter or shatter under impact **lead-** A soft glass with a low melting point, containing lead oxide, *e g* , flint glass **lime-** A glass containing calcium oxide, *e g* , venetian- **manganese-** A glass colored violet by manganese compounds **milk-** An opaque glass colored milky-white by cryolite **opal-** An opaque glass colored milky-white by calcium phosphate or bone ash **organic-** A term used for certain synthetic resins which have the appearance of glass, *e g* , perspex **muscovy-** Muscovite **normal-** A g of definite chemical composition **optical-** A glass used for optical purposes, *e g* , crown, flint, jena glass etc **plate-** A thick sheet of glass manufactured by pouring the molten glass on iron tables, then rolling and polishing it Used for mirrors or windows **potash-** Bohemian glass A glass containing more potassium than sodium, *e g* , crown, flint, etc **pyrex-** A heat-resisting glass, d 2 25, m 750, used extensively for chemical glass-ware and household dishes It contains a high proportion of silica **rolled-** An inferior quality of plate glass. **ruby-** A dark-red glass containing copper **compound**s or colloidal gold **safety-** Laminated g **silica-** Though not a true glass, fused silica is often used where a transparent, resistant **glass** is required **silicate-flint-** A jena glass used for optical purposes containing SiO_2 (29–53 %), PbO (67–36 %), K_2O (3–8 %), Na_2O (0–1 %), Mn_2O_3 (0 04–0 06 %), and As_2O_3 (0 2–0 3 %) **soda-** A glass containing more sodium than potassium, *e g* , venetian glass **soluble-** Waterglass **spun-** G wool **synthetic-** A glass-like, transparent plastic made (e g) by the condensation of urea and formaldehyde, as, pollopas, perspex **thallium-** A g containing Tl in place of Pb **toughened-** Plate glass which has been specially heat-treated to prevent splintering under impact Cf *bullet-proof g laminated g* **uranium-** A dichroic greenish-yellow glass containing uranium compounds, used for light filters **watch-** A small concave-convex glass used for watches, and in laboratories **water-** An aqueous solution of sodium or potassium tetrasilicate **window-** Ordinary glass plates manufactured by blowing the molten glass into cylinders, then slitting and flattening them out on tables **zinc-crown-** An optical glass consisting of 65 4 % SiO_2, 15 % K_2O, 5 % Na_2O, 9 6 % BaO, 2 0 % ZnO, 0 4 % As_2O_3, 0 1 % Mn_2O_3, and 2 5 % B_2O_3

g -beads Solid or hollow glass spheres, used to prevent excessive ebullition of heated liquids or, when properly calibrated, to determine the specific gravity of liquids **g colors** A metal or oxide used to give color to a glass, cf *glass* (6) **g cullet** (1) Broken g waste (2) The waste g left over in g manufacture, which is powdered and used as abrasive in matches, primers, polishes soaps and cements **g -cutter** Small mounted diamond fragments or a steel knife used for cutting glass plates or tubing **g -drops** Prince Rupert drops **g -gage** A circular metal disc with round holes used for measuring the outside diameter of glass tubing **g marking** Ceramic ink **g of antimony** The fused mass which results from the incomplete oxidation of stibnite **g -paper** Calico or paper covered with thin glue and sprinkled with powdered glass, used for levelling and polishing wood and metal **g -rods** A solid stick of glass **g -stirrer** A glass rod, either straight or suitably shaped **g -tubing** A hollow glass rod, used in making chemical and physical apparatus, having various diameters heavy or thin walls (*barometer-*) Capillary (*capillary-*) A thick-walled glass tube having a bore less than one millimeter in diameter **g tank** The container in which g is melted, it is lined with aluminum silicate **g -wool** Fine thin glass threads used for filtering, or in place of cotton wool

glassine A thin, hard and almost transparent paper made from well beaten chemical wood pulp

Glauber, Johann Rudolf 1603–1668 A Dutch iatrochemist who prepared sodium sulfate, hydrochloric acid and many metallic salts, and suggested improvements in industrial chemistry **g salt** Crystalline sodium sulfate

glauberite $CaSO_4 Na_2SO_4$ A calcium sodium sulfate found at Stassfurt

glaucine $C_{21}H_{25}O_4N$ = 355 3 An alkaloid from the sap of *Glaucium flavum* or yellow horned poppy, a Papaveraceae Yellow rhombic prisms, m 119 It is related to dicentrine and laurotetanine

glaucinic acid An acid from certain lichens

glaucochroite $CaMnSiO_4$ A rare calcium manganese silicate of the olivine group

glaucodot $(Fe,Co)S_2$, $(Fe,Co)As_2$ A cobalt iron sulfarsenide Cf *alloclasite*

glaucomelanic acid $C_{12}H_2O_6$ = 242 0 A black compound derived from ellagic acid

glauconite Bravaisite An amorphous, olive green, granular iron, potassium, aluminum, magnesium, calcium silicate formed from oceanic sediments, and occurring in the rocks of all ages

glaucophane $NaAlSi_2O_6 (Fe,Mg)SiO_3$ A rock-forming mineral of the amphibole series, occur-

ring in monoclinic, bluish-gray masses, d 3–3 1, hardness 6–6 5

glaucopicrine An alkaloid from the roots of *Glaucium flavum* and *Chelidonium majus*

glaze A glassy coating **enamel-** A suspension of metallic oxides in a glass which is burned into pottery or iron ware **porcelain-** A mixture of feldspar, lime and quartz fused into ware **salt-** A glassy covering of a silicate of sodium and aluminum produced on earthenware by adding salt to the kiln during firing **transparent-** A glass covering for earthenware

glazed Having a glassy or glossy appearance **g paper** A paper with a glossy surface, used in the laboratory for transferring precipitates, or for obtaining curves from delicate instruments, *e g*, from the kymograph, in which case the paper is previously smoked with carbon

gleditschine Stenocarpine An alkaloid from the leaves of *Gleditschia triacanthos*, three-thorned acacia or honey locust tree, a Leguminosae of the United States

glendonite A pseudomorphous variety of calcite found in Australia

gliadin Prolamin, vegetable protein A group of simple proteins or globulins derived from gluten, the protein of wheat, rye, durum, spelt, etc Wheat gliadin has the composition 52 72 % C, 6 86 % H, 17 66 % N, 1 03 % S, 21 73 % O, corresponding with the empirical formula $C_{685}H_{1068}O_{11}N_{196}S_5$ = 15,578 0

glidin An albuminous preparation from wheat flour, used as nutrient **arsenic-** Arsan **bromo-** G containing bromides **ferro-** G containing iron salts **iodo-** G containing iodides

gliode A complex gliadin-lipoid combination, of physiological importance

globin An animal protein in hemoglobin It is a stone-like body, insoluble in water, soluble in acids and alkalis, coagulated by heat, but redissolved by acids Proposed formula $C_{700}H_{1098}O_{196}N_{184}S_2$ = 15,283 **hemo-** See *hemoglobin* **oxyhemo-** See *hemoglobin*

globularesin $C_2H_{36}O_8$ = 404 4 A resin-like substance from *Globularia alypum*, the wild senna of Southern Europe

globularetin C_9H_6O = 130 0 A split-product of globularin

globularin $C_{15}H_{20}O_8$ = 328 2 An amorphous glucoside from the leaves of *Globularia alypum*, a Globulariaceae of Southern Europe

globulin A simple protein, coagulated by heat, insoluble in water, soluble in dilute solutions of salts **acid-** Syntonin **crystalline-** A g derived from the lens of the eye **serum-** A simple protein occurring in the blood That of the horse has the proposed formula $C_{629}H_{1002}O_{209}N_{160}S_5$

globulins A group of simple proteins (q v), as serum globulin, edestin, etc , in vegetable and animal tissues (blood, wheat, cotton seed, squash seed)

globulol $C_{15}H_{26}O$ = 222 20 A sesquiterpene alcohol from eucalyptus oil

globulose A split-product of globulins produced by peptic digestion

globulus A small sphere, *e g*, a button or drop of metal

glonoin Nitroglycerin

Glover tower A tower in sulfuric acid plants See *sulfuric acid manufacture*

glucal $C_6H_8O_3$ = 128 1 An unstable and toxic aldehyde derivative of glucose

glucase An obsolete term for maltase

glucic acid $C_3H_4O_3$ = 88 0 Acrolactic acid, β-hydroxyacrylic acid, 3-hydroxypropenoic acid* A colorless liquid, soluble in water

glucide A group-term including carbohydrates and glucosides, q v

glucin Sodium aminotriazinesulfonate A sweetening agent resembling saccharin

glucinic acid $C_{12}H_{16}O_9 \cdot 3H_2O$ = 358 2 A hexabasic acid formed in the decomposition of glucose by acids or alkalis Colorless crystals

glucinum Gl An obsolete name for beryllium, q v

gluco- See also *glyco-*

glucochloral Chloralose

glucocholic acid $C_{24}H_{39}O_4NHCH_2COOH$ = 465 52 Colorless needles, m 134, slightly soluble in water, soluble in alcohol or ether

glucofurone $C_6H_{10}O_6$ = 178 07 The γ-lactone of gluconic acid Cf *glucopyrone*

glucogen Glycogen

glucohydrazones A group of intermediate compounds formed during the ozasone reaction of carbohydrates by heating aromatic hydrazines and hexoses, *e g*, phenyl hydrazine and glucose $PhNHNH_2 + C_6H_{12}O_6 = C_6H_{11}O_5 N NHPh + H_2O$

glucokinin Insulin

gluconate A salt of gluconic acid containing the $HOCH_2(CHOH)_5COO—$ radical, usually a homogeneous paste **aluminum-** A salt of varying composition, partly a colloidal suspension of $Al(OH)_3$ in gluconic acid, used in tanning **calcium-** $[CH_2OH(CHOH)_5COO]_2Ca$ A white powder, used medicinally to obtain a calcium effect

gluconic acid $C_6H_{12}O_7$ = 196 1 Pentahydroxyhexoic acid*, dextronic acid, glycogenic acid *2 3 4 5 6*-hexapentol acid An isomer of mannonic acid, derived from glucose by oxidation Two optically-active isomers **dextro-** (Dextronic acid maltonic acid) A white powder, m 125, of pleasant sour taste In 65 % solution it forms lactones and becomes plastic Used for fruit jellies, baking powders, etc **levo-** $C_5H_6(OH)_5COOH$ A white crystalline solid, soluble in water, insoluble in alcohol

glucophore A group of atoms which form sweet compounds with atoms or radicals (auxoglucs) (Analogous to chromophore and auxochrome), *e g* —CHOH CH_2OH, $—NH_2$-CH COOH, and $—CH_2I$

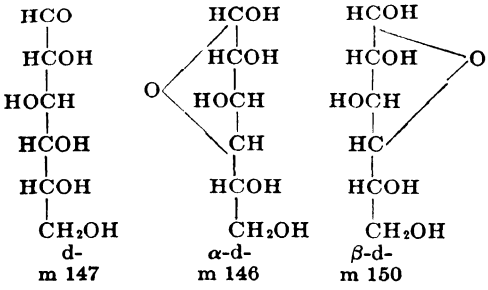
glucopyrone $C_6H_{10}O_6$ = 176 07 The δ-lactone of gluconic acid Cf *glucofurone*

glucosamine $C_6H_{13}O_5N$ = 179 2 An amino sugar, $CH_2OH(CHOH)_3CHNH_2CHO$ The amine of glucose and a split-product of chitin, b 110 (decomp)

glucosazone $C_{18}H_{22}O_4N_4$ = 358 31 A reaction product of monosaccharides and aryl hydrazines $C_6H_{12}O_6 + 3PhNHNHNH_2 = C_4H_9O_4C$ NNHPh —CH NNHPh + $PhNH_2$ (phenylglucosazone) + NH_3 + $2H_2O$ Their characteristic crystalline forms and melting points are used to separate, identify and distinguish monosaccharides

glucose $C_6H_{12}O_6$ = 180 15 Dextrose, phlorose, grape sugar, saccharum amylaceum A monosaccharide or carbohydrate constituent of many animal and vegetable fluids (blood, sweet fruits, etc), formed by hydrolysis of starch, cane sugar, and glucosides **dextro-** Colorless needles, d 1 562, m 147, soluble in alcohol or water Used as a reagent for

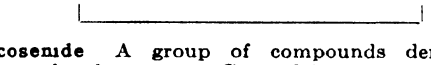
detecting carbon dioxide in blood, tellurous acid, etc , and in the form of glucose liquid or syrup, as a nutrient in pharmacy, industrially, in the manufacture of confectionery and the production of beer and alcoholic liquors, curing of tobacco, tanning, and as reducing agent The following structures are ascribed to its isomers



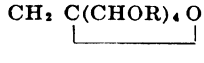
Instead of the 1,4-oxygen bridge (furanose) there is also the 1,5-linkage (pyranose) Cf *furanoside, pyranoside*

g agar-agar A culture medium containing 10 pts glucose, 15 pts agar, 10 pts peptone, 5 pts sodium chloride, and 1000 pts bouillon stock, neutralized with NaOH **g amine** $C_6H_{13}O_5N$ = 179 11 $C_5H_{11}O_5NH_2$, decomp 110 **g bouillon** A culture medium containing 10 pts glucose, 10 pts peptone, 5 pts salt, and 1000 pts bouillon stock, neutralized with NaOH **g evolué** A bacteriological medium having high reducing properties Prepared by heating a 10 % solution of g in 0 1 *N* NaOH at 110°C for 15 mins **g gelatin** A culture medium containing 10 pts glucose 100 pts gelatin, 10 pts, peptone, 5 pts salt, and 1000 pts bouillon stock, neutralized with NaOH **g imine** $C_6H_{13}O_5N$ = 179 11 $C_6H_{12}O_5NH$ A solid, m 128 **g liquid** Glucosum, syrup A thick liquid made by the incomplete hydrolysis of starch, and containing glucose and dextrins Used pharmaceutically as a nutrient **g oxime** $C_6H_{12}O_5NOH$ = 195 14 A reaction product of hydroxylamine and glucose, m 138

glucosene $C_6H_{10}O_5$ = 162 08 An unsaturated anhydroglucose of the type



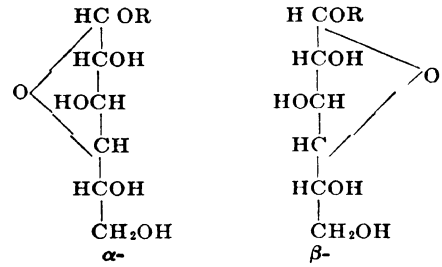
glucosenide A group of compounds derived from the glucosenes General formula



where R is Ac, Me, etc , they may occur in both α- and β-forms

glucosidase A hydrolytic enzyme which decomposes glucosides

glucoside (1) A compound of glucose, as, glucose-α-glucoside or maltose (2) See *glycosides* A neutral, non-nitrogenous, vegetable constituent decomposed by heat, dilute acids, alkalis, enzymes, bacteria or fungi to form a sugar (glucose) and another compound, (*e g* , salicin,strophanthin, amygdalin etc) Chemically they are the ethers of monosaccharides, and may occur in two types, **alpha-** and **beta-**glucosides



thus **methyl-** $C_7H_{14}O_6$ = 194 11, where R is CH_3 α- Long needles, m 168, [a] + 157° β- Rectangular prisms, m 104, [a] −33° In its derivatives the oxygen bridge may be between other carbon atoms, and is then indicated by numerals

<1, 3>, <1, 4>, or <1, 5>

Natural glucosides have the suffix *-in* and are classified as

1 Ethylene derivatives jalapin, sinapin, sinalbin, sinigrin

2 Benzene derivatives arbutin, populin salicin

3 Styrolene derivatives coniferin, phlorhizin, naringin, hesperidin, esculin, daphnin

4 Anthracene derivatives emodin, chrysophanic acid, frangulin, digitoxin

5 Cyanogen derivatives amygdalin

glucosimine Obsolete term for amino sugar

glucosin A group of ptomaine bases obtained by the action of ammonia on carbohydrates

glucosone $C_6H_{10}O_6$ = 178 1 An osone of glucose and aldehyde ketone formed as a reaction-product from glucosazone $CH_2OH-(CHOH)_3COCHO$

glucosophosphoric acid $C_6H_{13}O_9P$ = 260 1 The dibasic acid $(C_6H_{11}O_6)H_2PO_3$

glucothionic acid A substance obtained from nucleoproteins

glucotin A cement, a mixture of isinglass, gelatin and acetic acid

glucuronic acid $CHO(CHOH)_4COOH$ = 194 11 Glycuronic acid An aldehyde-hydroxy acid in urine, m 175, soluble in alcohol

glue Colla An impure gelatin obtained from animal organs by boiling with water, straining and drying, thin, hard and brittle cakes, used as a cement and adhesive **albumen-** G obtained from flour in starch manufacture **bone-** Artificial isinglass, a glue made from hides and bones **cartilage-** Chondrin **casein-** A solution of casein and borax, used as bookbinder's glue **elastic-** G containing glycerin and used for printer's rollers and flexible molds **fish-** Isinglass **liquid-** G acidified with acetic or nitric acid **marine-** A waterproof g or cement made of caoutchouc or shellac in turpentine, benzene, or other **skin-** G made from hides **vegetable-** Acacia **waterproof-** A fish glue dissolved in hot milk

glukagon An insulin-like albumin from the pancreas

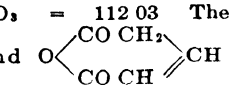
Glumiflorae An order of monocotyledonous plants, comprising the families of Cyperaceae and Gramineae

gluside, glusidum The official name for saccharin

glutaconic acid $C_5H_6O_4$ = 130 1 Propene dicarboxylic acid, pentenedioic acid* The dibasic, unsaturated acid,

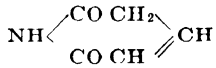
$$HOOC\,CH_2\,CH\,CH\,COOH$$
$$\alpha\quad\beta\quad\gamma$$

Colorless crystals, m 134 Cf *fumaric acid glutaric acid* **oxymethylene-** $C_6H_8O_5$ = 158 1 A dibasic, unsaturated acid

g anhydride $C_5H_4O_3$ = 112 03 The heterocyclic compound 

Colorless crystals, m 87, b $_{15mm}$152 An isomer of pyronone

glutaconimide $C_5H_5O_2N$ = 111 1 1 5-dioxypyridine The heterocyclic compound



Colorless crystals, m 182

glutamic acid $C_5H_9O_4N$ = 147 14 α-Aminoglutaric acid, glutaminic acid, glutanic acid $NH_2\,CH(COOH)CH_2\,CH_2\,COOH$ A colorless crystalline acid, decomp 208, soluble in water or alcohol It is a constituent of proteins and occurs chiefly in seeds and beets, also in the Japanese flavoring, ajinimoto **g a hydrochloride** A white powder which yields HCl with water, used medicinally

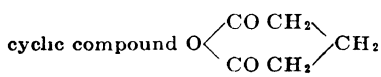
glutamine $C_5H_{10}O_3N_2$ = 146 13 The optically inactive amino acid $C_3H_5\,NH_2CONH_2$-COOH, slightly soluble in water, insoluble in ether or alcohol

glutaminic acid Glutamic acid

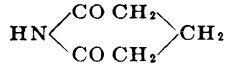
glutamyl The bivalent radical —OC CHNH$_2$-$CH_2\,CH_2\,CO$—

glutanic acid Glutamic acid

glutaric acid $C_5H_8O_4$ = 132 09 n-pyrotartaric acid, pentane-diacid, deoxyglutaric acid, pentanedioic acid*, $COOH(CH_2)_3COOH$ A dibasic acid in sheep wool Colorless monoclinic crystals, soluble in water, alcohol, or ether, m 97, b 290, a constituent of the grease of sheep wool, pus, etc **amino-** Glutamic acid **dimethyl-** $C_7H_{12}O_4$ = 160 1 Colorless crystals, m 127 **α-ethyl-** $C_7H_{12}O_4$ = 160 1 Colorless crystals, m 60, **β-ethyl-** Propidene diacetic acid Colorless crystals, m 67 **α-methyl-** $C_6H_{10}O_4$ = 146 1 Colorless crystals, m 76 **β-methyl-** Ethidene diacetic acid, colorless crystals, m 86

g anhydride $C_5H_6O_3$ = 114 1 The heterocyclic compound 

glutarimide $C_5H_7O_2N$ = 113 1 2,6-Piperidinedione The heterocyclic compound



Colorless crystals, m 152

glutaronitrile $C_5H_6N_2$ = 94 2 Trimethylenecyanide, pentane dinitrile*, $CN(CH_2)_3CN$ A colorless liquid, b 286

glutaryl The bivalent radical, $—OC(CH_2)_3-CO—$

glutathione $(NH_2)_2(C_4H_5O)CONH(C_2H_4S)CO-NHCH_2\,COOH$ γ-glutamyl cysteyl glycine A tripeptide occurring in blood and many animal organs, in embryos and germinating plants, etc Cf *thioneine* It is a hydrogen acceptor,

$$2RSH \rightleftharpoons RS\,SR + 2H,$$

and plays an important part in metabolism

glutazine $C_5H_6O_2N_2$ = 126 2 Betaimidoglutarimide Colorless crystals, m 300

glutelins A group of simple vegetable proteins, coagulated by heat and insoluble in water or dilute salts, soluble in very dilute acids or alkalis as glutenin, oryzenin

gluten A mixture of proteins occurring in the seeds of cereals, a grayish brown, sticky and tough mass remaining after washing the starch out of wheat flour with water It confers the property of toughness on dough The amino acids of glutens are

	Wheat	*Oats*	*Maize*
glutamic acid	24 0	18 4	12 7
leucine	4 1	15 0	6 2
proline	4 0	5 4	5 0
arginine	4 4		7 1
other amino acids	10 2	14 0	14 7
total amino acids	46 7 %	52 8 %	45 7 %

animal- *Fibrin*

glutenin A protein of wheat, soluble in dilute alkalis

glutin $C_{192}H_{294}N_{60}SO_{70}(?)$ A protein in gelatin

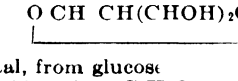
glutinic acid $C_5H_4O_4$ = 128 09 Pentinedioic acid, propine-1 3-dicarboxylic acid, HOOC C-C CH_2 COOH A white solid, m 146

glutol A reaction product of starch and formaldehyde Cf *amyloform*

glutolin $C_{204}H_{336}N_{60}SO_{70}$ Formalin gelatin A protein derived from gelatin

glutose The principal product formed by the action of alkali on invert sugar, probably a 3-ketohexose

glycals A group of derivatives of sugars obtained by removing H_2O_2, as



glucal, from glucose

glyceraldehyde $C_3H_6O_3$ = 90 1 Glyceric aldehyde, glyceryl aldehyde, *2 3*-dihydroxypropanal* $CH_2OH\,CHOH\,CHO$ A colorless solid, m 132, soluble in water, alcohol or ether

glycerals A group of compounds derived from glycerol and aldehydes, similar to the acetals

glyceramine $C_3H_9O_2N$ = 91 1 The amine of glycerol, $(CH_2OH)_2\,CH\,NH_2$

glyceric acid $C_3H_6O_4$ = 106 1 *1 2*-Dihydroxypropionic acid, *2 3*-dihydroxypropanoic acid*, the hydroxyacid $CH_2OH\,CHOH\,COOH$, which occurs in two stereoisomeric forms as *d-* and *l-* acids A colorless syrup-like liquid, soluble in water, alcohol or ether It is formed during alcoholic fermentation **α-phenyl-** Atroglyceric acid

glyceric aldehyde Glyceraldehyde

glyceride A group of ethers or esters derived from glycerol, *e g*, (R = fatty acid radical)

$CH_2O—R$	$CH_2O—R$	$CH_2O—R$
$CHOH$	$CHO—R$	$CHO—R$
CH_2OH	CH_2OH	$CH_2O—R$
mono-	di-	tri-

The fats and oils are mainly triglycerides of fatty-acids, *e g*, tripalmitin, tristearin, etc

glycerin Glycerol **g agar-agar** A culture media containing 60 cc glycerol, 15 gm agar,

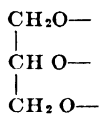
10 gm peptone, 5 gm sodium chloride, and 1000 cc bouillon stock, neutralized with NaOH

glycerinate A salt of glyceric acid indicated by the $C_3H_5O_4$— radical

glycerino- Glycero-

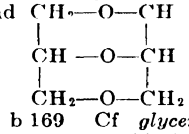
glycerinum Glycerol

glycero (1) Same as glyceryl (2) The trivalent radical from glycerol



glycerol $C_3H_8O_3$ = 92 08 Glycerin, glycerinum *1 2 3*-propanetriol*, propenyl hydrate $(CH_2OH)_2CHOH$ A clear, colorless, syrupy, sweet liquid, d 1 260, m 17, (but solidifies at much lower temperature), b 290, soluble in water or alcohol, insoluble in ether, chloroform, benzene, or carbon disulfide It is obtained by the saponification of fats in the soap industry, used as a solvent and reagent, technically in the manufacture of printer's ink and rolls, and in medicine for application to the skin It is the basis of many explosives and is used as a mordant, and with boric acid, as a preservative **absolute-** A glycerol entirely free from water **amyl-** Quintenyl glycerin, $C_5H_9(OH)_3$ **diethyl-** Diethylglycerol **mesitylene-** Mesicerin

g diacetate Diacetin **g dilaurate** Dilaurin **g dinitrate** Dinitroglycerin **g diphenylether** $C_{15}H_{16}O_3$ = 244 2 *1 3*-diphenoxy-*2*-propanol* A white crystalline solid m 80, b_{2mm} 175, used as plasticizer for nitrocellulose **g distearate** Distearin **g ether** $C_6H_{10}O_3$ = 130 2 Glyceryl ether The heterocyclic compound



A colorless liquid, d 0 091, b 169 Cf *glycerides, ethylin allylin, protosal* **g monochlorhydrin** $C_3H_7O_2Cl$ = 110 51 α- or 3-chloro-1 2-dihydroxypropane, *3*-chloro-*1 2*-propanediol* A colorless liquid, d 1 322, n_D^{25} 1 4811, $b_{0\ 5mm}$ 81 miscible with water, alcohol or ether, used in the synthesis of glycidol β- or 2-chloro-1 3-dihydroxy propane A liquid, d 1 321, b_{14mm} 124 **g monophenylether** $C_9H_{12}O_3$ = 168 1 *1*-phenoxy-*2 3*-propanediol*, autodyne A white solid m 53 $b_{0\ 6mm}$ 145, used as a plasticizer in lacquers, and medicinally in nervous diseases **g phosphoric acid** $C_3H_5(OH)_2H_2PO_4$ = 172 1 A dibasic acid An oily liquid and constituent of lecithins and nerve tissues, used in medicinal preparations **g sulfuric acid** $C_3H_5(OH)_2HSO_4$ **g tributyrate** Tributyrin **g trilaurate** Laurin **g trinitrate** Nitroglycerin **g tripalmitate** Palmitin **g tristearate** Stearin

glycerophosphate Lecithin A salt of glycerol phosphoric acid containing the bivalent $=PO_4C_3H_5(OH)_2$ radical

glycerophosphoric acid See *glycerol phosphoric acid*

glycerose $C_3H_6O_3$ = 90 1 A triose derived from glycerol, a mixture of glyceraldehyde and dioxyacetone, obtained by oxidation of glycerol It changes to acrose when treated with dilute NaOH

glycerosulfate A salt of glycerol sulfuric acid containing the monovalent $—SO_4—C_3H_5(OH)_2$ radical

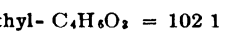
glycerosulfuric acid Glycerol sulfuric acid

glyceryl Propenyl The trivalent $\equiv C_3H_5$ radical, $—CH_2\,CH\,CH_2—$ derived from glycerol Cf *propenyl allyl* **g aldehyde** Glyceraldehyde **g chloride** Trichlorhydrin **g ether** Glycerol ether **g hydroxide** Glycerol **g laurate** Trilaurin **g linoleate** Trilinolein **g nitrate** Nitroglycerin

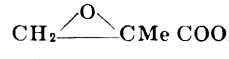
glycide Glycidol

glycides A compound containing the atomic group $—CH\langle O \rangle CH—$

glycidic acid $C_3H_4O_3$ = 88 0 Epihydrinic acid, epoxypropionic acid

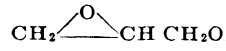


alphamethyl- $C_4H_6O_3$ = 102 1

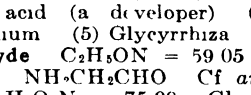


betamethyl- $C_4H_6O_3$ = 102 1 Colorless crystals m 84 an isomer of epihydrinecarboxylic acid **dimethyl-** $C_5H_6O_3$ = 114 1 Colorless crystals m 62

glycidol $C_3H_6O_2$ = 74 05 Glycide, epihydrin alcohol, ephidric alcohol, *2 3*-epoxy-1-propanol*



A colorless liquid, d 1 114, n_D^{25} 1 4032, b_{751mm} 162, miscible with water, alcohol or ether, used in organic synthesis **di-** $C_6H_{12}O_4$ = 148 96 The heterocyclic compound

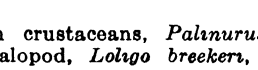


glycin (1) Glycine (2) p-Hydroxyphenyl aminoacetic acid (a developer) (3) Mannite (4) Beryllium (5) Glycyrrhiza

glycinaldehyde C_2H_5ON = 59 05 Aminoacetaldehyde NH_2CH_2CHO Cf *aminoacetal*

glycine $C_2H_5O_2N$ = 75 09 Glycocoll, aminoacetic acid, aminoethanoic acid*, glycocin, gelatin sugar, $NH_2\,CH_2\,COOH$ Colorless monoclinic crystals, d 1 575, m 232, slightly soluble in water, alcohol or ether It is a constituent of many proteins, and has a sweet taste **acetyl-** q v **benzoyl-** Hippuric acid **carbamyl-** Hydantoic acid **glycyl-** The simplest peptide $NH_2CH_2CONHCH_2COOH$ **guanylmethyl-** Creatine **N-methyl-** Sarcosine **α-methyl-** Alanine **trimethyl-** Betaine

g anhydride 2 5-Piperazinedione **g betaine** $C_5H_{11}O_2N$ = 117 08



occurs in crustaceans, *Palinurus Japanicus*, the cephalopod, *Loligo breekeri*, and in the octopus

glycine anhydride 2 5-Piperazinedione

glycinin The principal protein of the soya bean

glycirrhiza Glycyrrhiza

glycocholate A salt of glycocholic acid

glycocholeate A salt of glycocholeic acid

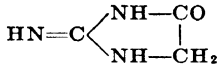
glycocholeic acid $C_{27}H_{45}O_5N$ = 465 3 A bile acid, a combination of glycogen and choleic acid Colorless, thick prisms, m 175, slightly soluble in hot water

glycocholic acid $C_{26}H_{43}O_6N$ = 465 4 A bile acid consisting of glycine and cholic acid Colorless crystalline needles, m 134, soluble in water, alcohol, or ether, insoluble in benzene or chloroform

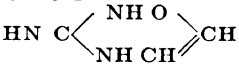
glycoclastic Glycolytic

glycocoll Glycine **g betaine** Glycine betaine

glycocyamidine $C_3H_5ON_3$ = 99 1 A colorless crystalline compound formed on dehydration of glycocyamine



iso- Glycolylguanidine The heterocyclic system



methyl- Creatinine

glycocyamine $C_3H_7O_2N_3$ = 117 2 Guanido acetic acid A colorless crystalline compound obtained from cyanamide and glycine HN=C(NH$_2$) NH CH$_2$ COOH **methyl-** Creatine

glycogen $(C_6H_{10}O_5)_x$ Animal starch, glucogen, liver sugar, hepatin A carbohydrate occurring in large amounts in the animal organism, especially liver (600 gm in human body) A colorless tasteless powder, readily hydrolysed to glucose, and giving a deep red color with iodine Acids hydrolyse it to dextrose, and enzymes to maltose

glycogenase An enzyme of the liver, which hydrolyses glycogen to maltose and dextrin

glycogenolysis The successive breaking down of glycogen in animal tissues (cf *staircase reaction*), including the final splitting and oxidation of glucose In *normal* tissue one glucose splits into lactic acid and one is oxidized, in *cancer* tissue thirteen split into lactic acid and one is oxidized

glycol (1) A member of the glycols, q v (2) $C_2H_6O_2$ = 62 06 The simplest diatomic alcohol CH$_2$OH CH$_2$OH Ethylene glycol, 1 2-ethane-diol*, dihydroxyethane A colorless liquid, d 1 115, m −17 4, b$_{20mm}$ 197 5, insoluble in ether, miscible with water or alcohol Used in antifreeze solutions for automobiles

60 % in water freezes at −49°C (−56°F)
35 % in water freezes at −20 6°C (−5°F),

as a solvent for cellulose esters in lacquers, and in the manufacture of low-freezing dynamites **benzylene-** Hydrobenzoin **butylene-** Butanediol **diethylene-** Carbitol **diphenyl-** Hydrobenzoin **ethylidene-** MeCH(OH)$_2$, known only in derivatives, as, acetals, chloral hydrate **mesitylene-** Mesitylene glycol **phenyl-** Cinnamic alcohol **propylene-** Propanediol **tetramethylene-** Butanediol **thiodi-** Dioxyethylene sulfide **tetramethylethylene-** Pinacone **tetraphenyl-** Benzopinacol **trimethylene-** Propanediol

g acetate See *g monoacetate, g diacetate*

g aldehyde $C_2H_4O_2$ = 60 04 Hydroxyaldehyde, hydroxyacetaldehyde, glycolal, hydroxyethanal* The simplest alcohol-aldehyde, CH$_2$OH CHO Colorless plates, m 96, soluble in water or alcohol, slightly soluble in ether

g amide $C_2H_5O_2N$ = 75 09 *2*-Hydroxyethaneamide*, *α*-hydroxyacetamide The simplest alcohol-amide, CH$_2$OH CONH$_2$ A colorless solid, m 120, b 147, soluble in water or alcohol

g bromohydrin C_2H_5OBr = 124 97 Ethylene bromhydrin, 2-bromo-1-hydroxyethane, CH$_2$OH CH$_2$Br A colorless liquid, b 147, soluble in water

g chlorohydrin C_2H_5OCl = 80 51 Ethylene chlorhydrin, 2-chloro-1-hydroxyethane CH$_2$OH CH$_2$Cl A colorless liquid, d 1 223, b 128, miscible with water

g cyanohydrin C_3H_5ON = 71 07 Ethylene cyanhydrin, 2-cyano-1-hydroxyethane, CH$_2$OH CH$_2$CN A colorless liquid, d$_0$° 1 059, b 222, miscible with water, alcohol, or ether

g diacetate Ethylene acetate **g dibromide** Ethylene bromide **g dichloride** Ethylene chloride **g dicyanide** Ethylene cyanide **g diiodide** Ethylene iodide **g dinitrate** Ethylene nitrate **g dinitrite** Ethylene nitrite

g ethers A group of compounds used as lacquer solvents, as

g butylether	see *butylcellosolve*
g dimethylether	see *dimethoxyethane*
g ethylether	see *cellosolve*
g methylether	see *methylcellosolve*

g leucine Norleucine **g monoacetate** Ethylene monacetate **g mercaptan** $C_2H_6S_2$ = 94 1 Dithioethylene glycol, (CH$_2$SH)$_2$ A colorless liquid, d 1 120, b 146, slightly soluble in water

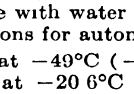
g salicylate Spirosal **g sulfhydrate** Ethylene mercaptan **g thiourea** $C_3H_4ON_2S$ = 116 13 A solid, soluble in water, alcohol or ether, m 200 (decomp)

glycolal Glycol aldehyde

glycoleucine Norleucine

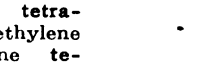
glycollic acid $C_2H_4O_3$ = 76 04 Glycolic acid Hydroxyacetic acid, hydroxyethanoic acid*, the simplest hydroxy-acid, CH$_2$OH COOH Colorless leaflets, m 78, decomp on heating, soluble in water, alcohol, or ether **diphenyl-** Benzilic acid **phenyl-** See *mandelic* and *amygdalic acids*

g aldehyde Glycol aldehyde **g amide** Glycol amide **g anhydride** $C_4H_6O_5$ = 134 07 (CH$_2$OH CO)$_2$O A colorless powder, m 129, insoluble in water, alcohol or ether

glycolide $C_4H_4O_4$ = 116 0 $(C_2H_2O_2)_x$ = (58 0)$_x$ Glycollide The anhydride of glycollic acid  Colorless leaflets, m 86, insoluble in water, soluble in alcohol, ether or acetic acid

glycolipins A group of fatty substances, yielding, on hydrolysis fatty acids and a carbohydrate, usually glucose They contain no phosphorus *e g*, cerebron, phrenosin, kerasin

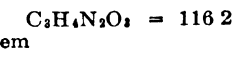
glycolocide A compound of the type



glycols Diols A group of diatomic alcohols of the aliphatic series, *e g*, aliphatic compounds containing two —OH groups, as *e g*, ethandiol (glycol), propandiol, butandiol, etc Analogous to alcohols there are

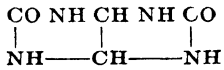
diprimary	two —CH$_2$OH groups
disecondary	two =CHOH groups
ditertiary	two ≡C OH groups
primary-secondary	one CH$_2$OH and CHOH groups
primary-tertiary	one CH$_2$OH and C OH groups
secondary-tertiary	one CHOH and C OH groups

glycolureine $C_3H_4N_2O_3$ = 116 2 The heterocyclic system



glycoluric acid Hydantoic acid

glycoluril $C_4H_6O_2N_4$ = 142 10 Acetylene diureine



White needles, soluble in water or alcohol

glycolyl (1) The monovalent radical, $HOCH_2$-CO— (2) The bivalent $=C_2H_2O$ radical

g guanidine Glycocyamidine

glycolysis The decomposition of glucose and other sugars by enzymes

glycolytic Glycoclastic The degradation of sugars to lactic acid, alcohol, carbon dioxide, etc , by the enzymes of animal tissues or blood

glycophospholipin A group of fatty substances which yield a fatty acid, a carbohydrate and phosphoric acid on hydrolysis

glycoproteins Glucoproteins A group of conjugated proteins containing a carbohydrate radical and a simple protein, *e g* , ichthulin, mucin, mucoids

glycosal Glycerol salicylate

glycosamine $C_6H_{11}O_5NH_2$ = 179 2 A decomposition product of chitin A colorless crystalline powder, slightly soluble in water

glycoside A compound of a sugar with some other substance, which occurs in nature and hydrolyses to the carbohydrate and some other substance, there are *glucosides* yielding glucose, *fructosides* yielding fructose, *galactosides* yielding galactose, etc Many pigments (as anthoxanthins and anthocyanins), saponins and tannins are glycosides

(ar) = arabinoside (di) = digitoxoside
(ga) = galactoside (gl) = glucoside
(ri) = riboside (rh) = rhammoside

1 ethylene derivatives

sinigrin, $C_{10}H_{16}NO_9S_2K$ (gl)	black mustard
sinalbin, $C_{30}H_{44}N_2O_{16}S_2$ (gl)	white mustard
jalapin, $C_{34}H_{56}O_{16}$ (gl)	jalap

2 benzene derivatives

arbutin, $C_{12}H_{16}O_7$ (gl)	bearberry
helicin, $C_{13}H_{16}O_7$ (gl)	willow bark
salicin, $C_{13}H_{18}O_7$ (gl)	willow bark
populin, $C_{20}H_{22}O_8$	aspen
gallotannic acid, $C_{76}H_{52}O_{46}$	tea, sumac
gaultherin, $C_{14}H_{18}O_8$ (gl)	gaultheria

3 styrolene derivatives

esculin, $C_{15}H_{16}O_9$	horse chestnut
daphnin, $C_{15}H_{16}O_9$	laurel
coniferin, $C_{16}H_{22}O_8$ (gl)	conifers
datiscin, $C_{21}H_{22}O_{12}$	datisca
phlorizin, $C_{21}H_{24}O_{10}$ (gl)	cherry bark
naringin, $C_{21}H_{26}O_{11}$	grapefruits
hesperidin, $C_{22}H_{26}O_{12}$	oranges

4 flavone derivatives (anthoxanthins)

quercitrin, $C_{21}H_{22}O_{12}$ (rh)	oak bark
(anthocyanins)	
cyanin $C_{27}H_{30}O_{16}$	cornflowers
delphinin, $C_{51}H_{38}O_{21}Cl$	larkspur

5 anthracene derivatives

frangulin, $C_{21}H_{20}O_9$ (rh)	buckthorn
saponin, $C_{32}H_{54}O_{18}$	soapwort
rubianic acid, $C_{26}H_{28}O_{14}$	madder
caulosaponin, $C_{55}H_{88}O_{17}$	caulophyllum
caulophyllosapogenin, $C_{56}H_{88}O_9$	caulophyllum

6 cyanogen derivatives

gynocardine, $C_{13}H_{19}NO_6$ (gl)	gynocardia oil
sambunigrin, $C_{14}H_{17}NO_6$	elder
prulaurasin, $C_{14}H_{17}NO_6$	cherry laurel
prunosin, $C_{14}H_{17}NO_6$	prunes
phaseolunatin, $C_{14}H_{17}NO_6$	lima beans
dhurrin, $C_{14}H_{17}NO_7$	sorghum
amygdalin, $C_{20}H_{27}NO_{11}$ (gl)	almonds
lotusin, $C_{28}H_{31}NO_{16}$	lotus

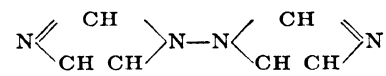
7 indoxyl derivatives

indican, $C_{14}H_{17}NO_6$ (gl)	indigo

8 cholane derivatives

digitalin, $C_{35}H_{56}O_{14}$ (gl)	digitalis
digitonin, $C_{54}H_{92}O_{28}$ (gl)	digitalis
digitoxin, $C_{34}H_{54}O_{11}$ (di)	digitalis

glycosine $C_6H_6N_4$ = 134 3 Bisglyoxaline The heterocyclic system



glycotropin A hormone similar in effect to prolactin, q v

glycuronate A salt of glucuronic acid

glycuronic acid Glucuronic acid

glycyl The monovalent NH_2CH_2COO—, or bivalent —NH CH_2 COO— radical derived from glycine (aminoacetic acid), it occurs in peptides, as, glycyl-alanine, glycyl-glycine, glycyl-alanyl-glycine, etc

glycyrrhetin $C_{18}H_{26}O_4$ = 306 3 An amorphous bitter substance derived from licorice root

glycyrrhiza (1) Licorice The dried aqueous extract of licorice root A lustrous, black, brittle mass, soluble in water (2) The rhizome and roots of *G glabra typical* (Spanish licorice), or *G glabra glandulifera* (Russian licorice), a Leguminosae

glycyrrhizic acid $C_{44}H_{64}O_{19}N$ = 910 50 A crystalline acid, m 220, derived from licorice

glycyrrhizin $C_{44}H_{66}O_{18}N$ = 896 6 A sweet principle from the roots of licorice Dark-brown scales, soluble in water or alcohol

glyoxal $C_2H_2O_2$ = 58 03 Oxalaldehyde, ethanedial*, diformyl, oxal, $(CHO)_2$ A colorless, amorphous and deliquescent powder or liquid, d 1 14, m 15, b 50 5, soluble in water, alcohol, or ether **difuryl-** Furil **dimethyl-** Biacetyl **diphenyl-** Benzil **methyl-** Pyruvaldehyde **phenyl-** Benzoyl formaldehyde

glyoxalase An enzyme which occurs in all animal tissues, except pancreas and lymph-glands It converts glyoxal or its substitution compounds into glycollic acid or its substitution compounds

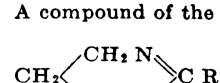
$$R—COCHO + H_2O = R\,CHOHCOOH$$

glyoxalcarbonic acid $C_3H_2O_4$ = 102 0 H CO-CO COOH

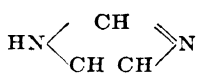
glyoxalene Imidazole

glyoxalic acid (1) $C_2H_2O_3$ = 74 0 Glyoxylic acid, ethanal acid, oxoethanoic acid*, oxaldehydic acid, the simplest aldehyde acid HCO-COOH Colorless rhombic crystals, soluble in water, forming the hydrated acid $(HO)_2$-CH COOH Cf *glyoxylic acid* **g hydrate** Glyoxylic acid

glyoxalidine A compound of the type



glyoxaline $C_3H_4N_2$ = 68 13 The azole



Imideazole, 1 3-diazole Colorless prisms, m - 88°, b 255, very soluble in water, alcohol or ether **bis-** Glycosine **triphenyldihydro-** Amarine **g alkaloids.** A group of alkaloids containing the imidazole nucleus, *e g*, pilocarpine, pilocarpidine

glyoxime $C_2H_4O_2N_2$ = 88 12 The diimide $(CH\ NOH)_2$ Colorless, rhombic tablets, m - 178, soluble in water, alcohol or ether Cf *dimethylglyoxime, Tschugajew's reaction*

glyoxyl The monovalent CHO CO— radical, derived from glyoxal **g carboxylic acid** Glyoxal carbonic acid

glyoxylase Glyoxalase

glyoxylic acid $C_2H_4O_3$ = 92 04 Glyoxalic acid hydrate, dihydro-acetic acid, *1 1*-dihydroxyethanoic acid*, $(HO)_2CHCOOH$ The hydrated and crystalline form of glyoxalic acid, q v It occurs in unripe fruit **amino-** Oxamic acid **aminophenyl-** Isatic acid **carboxyphenyl-, o-** Phthalonic acid **p-** Terephthalic acid **methyl-** Pyruvic acid **phenyl-** Benzoyl formic acid

glyoxylic aldehyde Glyoxal

glyptal A trade name for synthetic resins prepared from a polyhydric alcohol and phthalic anhydride

gm An abbreviation for grams (Gm in U S Phar XI)

Gmelin, Christian Gottlieb 1792–1860 A German chemist noted for making artificial ultramarine **G, Johann Friedrich** 1748–1804 German physician and writer on chemistry and pharmacy **G, Leopold** 1788–1853 A German chemist noted as a discoverer of potassium ferricyanide and a prolific author **G test** The detection of bile acids in urine by means of nitric acid, which is dropped on filter paper saturated with urine, a series of concentric rings of various colors appears

gmelinite $(Ca,Na_2)Al_2Si_3O_{12}$ A native chabazite

gneiss A group of crystalline metamorphic rocks, which consist typically of quartz or feldspar

gnoscopine $C_{34}H_{35}O_{11}N_2$ = 648 4 *dl*-Narcotine An opium alkaloid, m 229 Found in the mother liquor of narceine and synthesized by dehydration of a molecular mixture of meconine and cotarnine

goa Araroba, crude chrysarobin, goa powder, Brazil powder A light yellow powder from the cavities in the trunks of *Andira araroba*, a Leguminosae of Brazil It contains 80 % chrysarobin, and resin, gum, etc, and is used in skin diseases (taenifuge) and as a source of chrysarobin Cf *yaba bark, andirin*

Gockel condenser A condenser, similar to Liebig's, in which the inside tube is U-shaped, one arm is connected to the distilling flask, the other to a hood, etc, while at the base the tube may be connected with an air-tight receiver

goethite FeO OH Ruby mica A hydrated oxide of iron (cf *göthite*)

Goethlin See *Göthlin*

gold Au = 197 2 Aurum An element of atomic number 79 A yellow ductile, noble metal, $d_{17.5°}$ 19 32, m 1065, b 2500, insoluble in acids or alkali, soluble in aqua regia It occurs in nature as an uncombined metal, has valencies of 1 and 3, and tends to form complex compounds

aurous	Au^+
auric	Au^{+++}
dicyano aurate	$Au(CN)_2^-$
tetroxy aurate	$Au(OH)_4^-$
tetrachlor-aurate	$AuCl_4^-$
disulfo aurate	AuS_2^-

The world's gold production (in million fine ounces) was

	1933	1934	1935	1939
South Africa	11 0	10 5	10 7	12 8
Russia	2 8	4 2	5 3	5 0
U S A	2 5	2 9	3 4	4 3
Canada	2 9	2 9	3 3	5 1

coinage- An alloy of 90 % Au and 10 % Cu **fulminating-** Aurodiamine **hall-marked** Standard **g liquid-** A mixture of a solution of a complex organic g compound in an essential oil with an adhesive It is brushed on to pottery, and burned in to form a pattern **mosaic-** q v **rhodium-** Rhodite A native alloy of 57–66 % Au and 34–43 % Rh **standard-** Pure gold (24 karats) and 4 alloys of 22, 18, 14 and 9 karats are legal standards in England Four alloys are used in the U S A — 22, 18, 14 and 10 karats **white-** An alloy of g with 20 % of Pd, used in jewelry **g alloys** An alloy of gold and another metal, see *coinage metal, gold plate, standard gold* The melting points of the principal alloys are

Gold with	21 6 90 % 10 %	19 2 80 % 20 %	16 8 70 % 30 %	14 4 60 % 40 %	12 karats 50 % 50 %
Ag	1062°	1061°	1058°	1054°	1049°
Al	675	1055	1025	970	915
Cu	910	890	895	905	925
Pt	1125	1190	1250	1320	1380

The gold content of alloys is indicated (1) in "karats" (q v), or parts in twenty-four (2) By the fineness (parts per 1,000) **g amalgam** A fusible crumbling amalgam of gold (40 %), silver, and mercury **g bromide** See *auric* or *aurous bromide* **g chloride** See *auric chloride* **g cyanide** See *auric*, or *aurous cyanide* **g dichloride** $AuCl_2$ = 267 9 A reddish crystalline powder, decomp by water **g foil** Thin leaves of hammered gold, used for gilding, lettering, or in dental work **g iodide** See *auric iodide* or *aurous iodide* **g leaf** G foil **g monobromide** Aurous bromide **g monochloride** Aurous chloride **g monoiodide** Aurous iodide **g number** A measure of the protecting action of a colloid The weight (in mgms) which, when added to 10 cc of a 0 005–0 006 % red g sol, just prevents the color change to blue (due to coagulation) on addition of 1 cc of 10 % sodium chloride

solution **g perchloride** Auric chloride **g plate** An alloy of gold, silver and copper *E g*, 18 karats 18 pt Au, 2 pt Ag, and 4 pt Cu 20 karats 20 pt Au, 2 pt Ag, and 2 pt Cu **g plating** The electrodeposition of gold from a solution of gold cyanide in potassium cyanide **g salt** G sodium chloride **g size** A solution of white and red lead and yellow ochre in linseed oil, used to seal permanent microscopical preparations **g sodium bromide** $NaAuBr_4$, $2H_2O$, sodium aurobromide A yellow, water-soluble salt used in photography **g sodium chloride** $NaAuCl_4\,2H_2O$ = 398 1 Sodium aurochloride A yellow hygroscopic crystalline mass, soluble in water, used in photography for toning **g sponge** A porous spongy form of metallic gold obtained by precipitating gold solution with oxalic acid, and drying and heating the precipitate **g terchloride** Auric chloride **g tribromide** Auric bromide **g trichloride** Auric chloride **g tricyanide** Auric cyanide **g triodide** Auric iodide **g trioxide** Auric oxide **g trisulfide** Auric sulfide

golden g rod Solidago **g seal** Hydrastis **g yellow** Naphthalene yellow

Goldschmidt's process Thermite process

Golo process A process of bleaching flour with nitrosyl chloride

gomabrea An exudation from a Chilean tree, used as a substitute for gum arabic

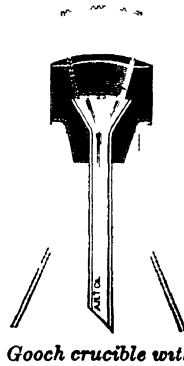
Gomberg, Moses 1866– An American chemist, noted as pioneer in the study of free radicals

gonan The luteinsing sex hormone of pregnancy urine

gondoic acid $C_{20}H_{38}O_2$ = 310 31 An eicosenoic acid from the oil of the pilot whale

goniometer An optical device for measuring angles, especially of crystals

Gooch, Frank Austin 1852– An American chemist, noted for analytical methods **G crucible** A crucible with a perforated bottom It is used in analytical work for filtering through glass or asbestos The precipitate is then dried and weighed (see figure)



Gooch crucible with funnel and holder

goose foot Chenopodium

Gordon, Neil Elbridge 1886– An American chemist noted for his work in chemical education

Gore phenomenon The recalescence of an alloy or steel on cooling, due to transition into another crystalline form

gorgonin A scleroprotein from the skeletal tissue of the coral *Gorgonia cavollisa* (sea fans), which contain 9 % di-iodo-tyrosine

gorli oil The fixed oil of *Oucoba echinata*, a Flacourtiaceae of South Africa, which resembles chaulmoogra oil

gosio gas C_3H_9As = 119 91 Trimethyl arsine, $AsMe_3$ A gas of garlic odor generated by certain molds growing in media containing carbohydrates and arsenic compounds

goslarite $ZnSO_4,7H_2O$ A mineral zinc sulfate

gossypetin $C_{15}H_{10}O_8$ = 318 08 3 5 7 8 3′ 4′-hexahydroflavone A flavone (q v) of gossypium, m 230

gossypiin Gossypoid

gossypin The cellulose of cotton

Gossypium (1) The cotton plant, a genus of Malvaceae (2) Cotton, or the hairs of the seeds of *G herbaceum*

gossypoid The combined principles from the bark of the root of *Gossypium herbaceum* (cotton root bark), used as an emmenagogue

gossypol The toxic principle of cotton seeds **bound-** An ether-insoluble product formed from **g** in the commercial manufacture of cottonseed meal

göthite Fe_2O_3,H_2O Pyrrhosiderite A crystalline hydrated ferric oxide (cf *goethite*)

Gothlin solution An artificial serum consisting of 6 5 gm NaCl, 1 gm $NaHCO_3$, 0 1 gm KCl, 0 13 g $CaCl_2$ per liter water

Gottling, Johann Friedrich August 1755–1809 A German apothecary, and the first in Germany to accept Lavoisier's theory

Göulard's extract A solution of basic lead acetate, $Pb(OH)_2\,Pb(OAc)_2$, used as a reagent for phenols

goutine Citarin

gr An abbreviation for grain

Grabe See *Graebe*

grade The ratio of the rise of a slope to its length, the sine of the angle of slope

graded Differentiated **g potential** A method of analysis by electro-deposition in which various metals are separated at specific voltages

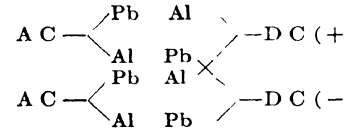
grading The sorting of materials on the commercial scale according to size, quality, rank, etc by gravity action (air separators), centrifugal force (cyclone separators), or mechanical action (screening)

graduate (1) A measuring device for liquids, generally a cone-shaped or cylindrical vessel marked with lines showing the volume (2) One who has earned a degree from a college or university

graduated Divided into units by a series of lines, as a vessel which is marked for measuring liquids *E g*, cylinders, thermometers, rulers etc

Graebe, Carl 1841–1927 A German organic chemist who established the constitution of naphthalene, anthracene and phthalic acid, etc Co-synthesizer (with Liebermann) of alizarin

Graetz rectifier A device for converting alternating current to direct current, consisting essentially of four electric cells with lead and aluminum plates in a solution of sodium bicarbonate and connected as follows



Graham, Thomas 1805–1869 A Scottish chemist, and pioneer in the study of colloids, the diffusion of gases and dialysis He introduced bronze coinage **G law** The velocities of diffusion of any two gases are inversely proportional to the square roots of their densities, hence $\frac{v_1}{v_2} = \frac{\sqrt{d_2}}{\sqrt{d_1}}$ Cf *diffusion law* **G salt**

Soluble sodium hexametaphosphate Prepared by strongly heating monosodium dihydrogen orthophosphate, and rapidly cooling the molten mass

grain (1) A unit of the apothecaries avoirdupois, and troy weights (originally that of an average wheat grain)
1 gr = 64 798918 mg = 0 064798918 gm ,
1 gr = $\frac{1}{20}$ scruple = $\frac{1}{60}$ dram = $\frac{1}{480}$ ounce = $\frac{1}{5760}$ pd
(2) The seeds of Gramineae or the cereals (3) The appearance of a heterogeneous surface, *e g* the size of particles in a photographic plate or alloy **g alcohol** Ethanol **g germinator** Germinator **g oil** Fusel oil **g tester** (1) Germinator (2) A device for sectioning grains

graininess The lack of homogenity of deposits due to aggregations of particles, as shown in photomicrographs

gram (1) As suffix a mechanical record, as, photogram, spectrogram Cf *graph* (2) Gramme, g , gm , (Gm , U S P XI) A unit of weight in the C G S system the mass of 1 000027 cc water at 4°C See *liter*
1 g = 1000 mg = 1000000γ = $\frac{1}{1000}$ kg
1 g = 15 43248 gr = 0 03527 av oz = 0 03215 ap oz
kilo- One thousand grams = 1 kg
micro- The one-millionth part of a gram, 1μg or 1γ
milli- The one-thousandth part of a gram, 1 mg
g -atom- The atomic weight of an element expressed in grams **g calorie** Small *calorie* **g centimeter** The gravitational unit of work, g ergs **g equivalent** The equivalent weight of a substance expressed in grams, or n grams of a substance, where n is atomic weight/valency **g molecular solution** Molar solution **g molecular volume** The volume at 0°C and 760 mm pressure occupied by 1 mol of an element For a gas it equals the volume of 2 gm hydrogen at N T P /limiting density = 22 242 liters **g molecular weight** G molecule **g molecule** The molecular weight of a substance expressed in grams, or one mol

Gram, Hans C J 1853–1938 A Danish bacteriologist noted for his methods of identifying bacteria **G -negative** Gram-negative Bacteria which are decolorized by G method of staining **G -positive** Gram-positive Bacteria which retain the Gram stain **G 's iodine solution** A solution of 1 pt iodine, 2 pts potassium iodide in 200 pts water, used for staining microscopical sections and bacteria **G 's stain** A solution of 15 cc aniline, 7 cc saturated alcoholic solution of methylviolet, 10 cc absolute alcohol in 100 cc water Used as a test stain in bacteriological work

gramicidin A compound isolated from cultures of certain bacteria in phosphate-enriched soils, which is toxic to all Gram-positive organisms

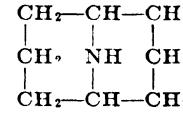
Graminaceae, Gramineae The grass family, a group of plants that yield cereals, sugar, starch and essential oils

Saccharum officinarum	cane sugar
Agropyron repens	triticum
Zea mays	Zea or Indian corn maize oil corn starch dextrin
Avena sativa	oatmeal
Triticum vulgare	wheat flour
Lolium temulentum	temulentine
Cf *ergot, andropogon bamboo esparto*	
Metroxylon sagu	pearl sago
Colocasia esculenta	taro flour or poi
Oryza sativa	rice rice starch
Hordeum distichum	barley malt malt extract

gramine A protein m 133, from barley

gramme Gram Used in the B P

granatanine $C_8H_{15}N$ = 125 2 *1 5*-Imino-cyclo-octane The heterocyclic compound



granatine An alkaloid from pomegranate

granatonine Pseudo-*pelletierine*

granatotannic acid $C_{20}H_{16}O_{13}$ = 464 1 An amorphous substance from the root-bark of *Punica granatum* or pomegranate

granatum Pomegranate

grandiflorine An alkaloid from the fruit of *Solanum grandiflorum*

granite A crystalline, igneous rock, consisting of quartz, orthoclase with both muscovite and biotite, which has cooled slowly under great pressure

granular Grain-like

granulated Made of small particles

granulation The process of converting a substance into granules or grain-like particles, *e g* , by rubbing the moist substance through a sieve, or by rapidly quenching drops of a molten metal (as with granulated zinc)

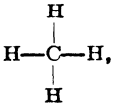
granule (1) A small grain (2) A medicinal substance in the form of small pellets

granulose (1) β-amylose A sugar of starch found in plants, enclosed by an envelope of starch cellulose It gives the blue color with iodine solution (2) The product obtained when cotton wool is charred

grape (1) Vine The plant *Vitis vinifera* (2) The edible fruit of *Vitis* species **mountain-** The root of *Berberis aquifolium*, a Berberidaceae, used as an alterative and tonic **Oregon-** Mountain
g fruit The edible fruit of *Citrus maxima*, rich in vitamin C **g juice** The expressed and sterilized, unfermented juice of g used as beverage **g pomace** A fertilizer consisting of the dried cake remaining after pressing the juice from grapes It contains about 1 2 % N, small amounts of P and K **g seed oil** An oil expressed from g seeds, and used as lubricant for watches and for coating raisins, d 0 923, n_D 1 477, acid value 4–5, sapon no 182 **g sugar** Glucose

graph As suffix (1) a pictorial record, *e g* , photograph Cf *gram, diagram* (2) An instrument to make mechanical records, (gram), as, spectrograph, telegraph
As noun (1) A record obtained by physical means, as, electrochemical spectrum (2) A line drawing showing the frequency or periodicity of a phenomenon or relating 2 variables

graphic Pertaining to diagrams **g formula** A spacial structure formula, *e g* ,



or a geometrical drawing indicating the isomeric forms of certain carbon compounds **g symbol** See *structure symbol, molecular diagram*

graphite Black lead, plumbago A native or artificially-made allotropic carbon, shining amorphous masses or hexagonal lamellae, d 1 9–2 3, hardness 0 5–1 0 Used as pigment, as material for crucibles, retorts, electrodes and pencils, and as a lubricant **colloidal-** Deflocculated suspensions of graphite in oil (oildag) or in water (aquadag), used as lubricants Cf *dag*

graphitic acid $C_{11}H_4O_5$ = 216 0 An acid produced from native graphite by the action of potassium chlorate and nitric acid, as a yellow-green powder **pyro-** See *pyrographitic acid*

graphon sulfate The black substance produced by the slow action on graphite of potassium chlorate and concentrated sulfuric acid

grappa A brandy prepared by fermenting pressed pomace, adding grape residues etc , and distilling

grasses See *Graminaceae* **g time factor** A supposed vitamin (q v) in grass juice, the absence of which affects the optimum growth-rates of rats and guinea pigs

grating A lattice work or screen composed of lines, *e g* , a glass, metal, or film with minute fine rulings (often 20,000 per centimeter) and producing a series of spectra by the dispersion of a ray of light Cf *diffraction* **concave-** A slightly concave piece of speculum metal on which the lines are ruled, it focuses the light and no collimator is needed **plane-** A g which requires parallel rays of light, hence a slit, collimator and telescope **g spectroscope** A spectroscope in which the spectrum is produced by diffraction (by means of a grating), and not by refraction (prisms)

gratiolin $C_{20}H_{24}O_7$ = 386 3 A glucoside from *Gratiola officinalis* or hedge hyssop, a Scrophulariaceae, yellow silky needles

gratiolirhetin $C_{17}H_{28}O_{21}$ = 728 3 A resinous decomposition product of gratiolin

gratioloic acid $C_{28}H_{56}O_4$ = 456 5 An acid from *Gratiola officinalis*, pearly white scales

gratiosoletin $C_{20}H_{68}O_{17}$ = 586 7 A decomposition product of gratiosolin

gratiosolin $C_{46}H_{84}O_{21}$ = 1036 8 A glucoside from *Gratiola officinalis*, hydrolysed by water to gratiosoletin

graukalk Technical calcium acetate

gravimetric Measurement by weight **g analysis** Quantitative analysis by weighing precipitates

gravimetry The science of measurement by weight

gravitation (1) The universal attraction between material bodies Its intensity varies directly as the product of the two masses (2) The tendency of substances to move toward the center of the earth, as measured by the gravitation constant, *g* **g constant** A measure of the attractive force of the earth *g* = 666 07 × 10^{-10} cm /^{3}gs ^{2} = 980 665 cm /sec ^{2} **g formula** The force, f, of gravitational attraction between two masses, m and m_1, separated by the distance r = $G\frac{mm_1}{r_2}$, where G is the gravitation constant = 6 658 × 10^{-8} dynes cm ^{3}/gs ^{2}

gravitational Pertaining to gravitation **g constant** Gravitation constant **g effect.** Westling effect The loss of weight of body A weighed underneath body B on a beam balance The effect is specific for those pairs of elements whose atomic numbers are related by $B^2/A^2 = n$, where n is an integer **g force** Gravitation formula

gravity (1) The tendency of substances to move toward the center of the earth, *e g* , the attractive force of the earth for bodies, measured by the gravitation constant (2) Specific gravity Cf *Helmert's equation* **distillation-** The specific gravity of 200 cc of distillate from 200 cc of an alcoholic liquor **original-** O G The specific gravity of a wort before fermentation as determined from the amount of alcohol in the fermented liquor It is given by the residual gravity plus the gravity lost according to the spirit indication (q v) **present-** The actual specific gravity of a fermented liquor **residual-** The specific gravity of the liquid remaining after all the alcohol has been removed by distillation from 200 cc of a fermented liquor, and the residue made up to 200 cc **specific-** See *density* and *specific gravity*

gravure A process of printing from an inked metal surface which has been etched with acid in such a way that the darker the shade the deeper the etch and the more ink it holds available for transfer to the paper

gray, grey Ash color, a mixture of white and black pigments See **grey**

grease (1) Any soft, butter-like fat (2) Any low-grade waste products containing lard, tallow, bone, horse or fish fat, stearins etc Greases usually have an unpleasant odor, high unsaponifiable matter and free fatty acids, and are dark colored They are used as lubricants **black-** A dark fatty matter obtained from cotton-seed oil, and used in candle manufacture **cup-** An emulsion of mineral oil (80 %), lime soaps, water (1 %) used as a lubricant **Yorkshire-** Lanolin

Greek alphabet

				*
A	α	alpha (*al'-fah*)	a	1
B	β (δ)	beta (*be'-tah*)	b	2
Γ	γ	gamma (*gam'-ah*)	g (hard)	3
Δ	δ (∂)	delta (*del'-tah*)	d	4
E	ϵ (ε)	epsilon (*ep-si'-lon*)	e (short)	5
Z	ζ	zeta (*ze'-tah*)	z	6
H	η	eta (*e'-tah*)	e (long)	7
Θ	θ (ϑ)	theta (*the'-tah*)	th	8
I	ι	iota (*i-o'-tah*)	i	9
K	$\varkappa$ (κ)	kappa (*kap'-ah*)	k	10
Λ	λ	lambda (*lam'-dah*)	l	11
M	μ	mu (*mū*)	m	12
N	ν	nu (*nū*)	n	13
Ξ	ξ	xi (*ksi*)	x	14
O	o	omicron (*om-i'-kron*)	o (short)	15
Π	π	pi (*pi*)	p	16
P	ρ (ϱ)	rho (*ro*)	r	17
Σ	σ s	sigma (*sig'-mah*)	s	18
T	τ	tov, tau (*taw*)	t	19
Υ	υ	upsilon (*up-si'-lon*)	u	20
Φ	φ (ϕ)	phi (*fi*)	ph (f)	21
X	χ	chi (*ki*)	ch (hard)	22
Ψ	ψ	psi (*psi, si*)	ps	23
Ω	ω	omega (*o'-me-gah*)	o (long)	24

* In chemical names the Greek letters are used to indicate the carbon atoms, thus "λ-hydroxy" means a hydroxyl radical on the eleventh carbon atom

Greek numerals (as used in chemistry)

1 hen (mono)	18 octadeka
2 duo (bi)	19 nonadeka
3 tria	20 eicosa
4 tetra	21 heneicosa
5 penta	22 docosa
6 hexa	23 tricosa
7 hepta	30 triakonta
8 octo	40 tetrakonta
9 nona	50 pentekonta
10 deka	60 hexekonta
11 hendeka	70 heptakonta
12 dodeka	80 octokonta
13 trideka	90 nonakonta
14 tetradeka	100 hekaton (hekta)
15 pentadeka	1000 chilioi (kilo)
16 hexadeka	10,000 myria
17 heptadeka	

green (1) Grass color, a hue obtained by mixing yellow and blue pigments (2) Unused or raw, untreated or incompletely treated **g pigments** See *arsenic green, brunswick green, chrome green, copper green Guignet green ultramarine green, Rinman green, etc* **g vitriol** Ferrous sulfate

greenockite CdS A rare mineral cadmium sulfide

greensalt A wood preserving solution containing potassium dichromate, copper sulfate and arsenic acid

greensand (1) A sandy deposit containing glauconite (2) Natural sand dampened for molding

greenstone A variety of jade

greisen A granite in which feldspar is replaced by quartz

Grenacher stain Three solutions (alum-, borax- and hydrochloric acid-carmines), used for staining the nucleic and muscle tissues

Grenet battery An electrolytic cell of the carbon-zinc type

grenz rays Infra-rontgen rays, Bucky rays, long-wave x-rays Very soft x-rays produced at low voltages and absorbable by glass, used in skin diseases Cf *radiations*

Grethen weighing bottle A small glass tube with a ground glass stopper holding a glass tube and stopcock, used for weighing corrosive and fuming liquids

grey oil Gray oil A mixture of 40–50 % finely-divided mercury in an oil base, used as an ointment and in hypodermic medication **g powder** A dried finely-divided mixture of 38 % mercury, 57 % chalk with 10 % honey

Griess, Peter 1829–1888 A German-born English chemist, noted for his work on diazo-compounds **G reaction** The substitution of amino radicals by hydroxyl, halogen, or cyan radicals The amine is diazotized, and treated with water or a solution of a cuprous halide **G -Ilosva reagent** A solution of sulfanilic acid and α-naphthylamine in acetic acid, used as a reagent for nitrites

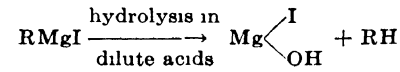
grifa Lithium acetyl salicylate

Griffith white Lithopone

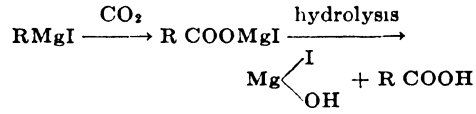
Grignard, Victor 1871–1935 A French chemist and Nobel Prize winner (1912), noted for organic syntheses **G 's reaction** Magnesium alkyl-condensation A synthetic reaction, by which a carbon atom is introduced into the hydrocarbon radical of a compound by G 's reagent It offers a ready means of passing from a lower member of a homologous series to a higher member, and has become one of the most valuable methods of organic synthesis **G 's reagent** Any one of a group of organic magnesium compounds of the general type R Mg X, where R is an organic radical and X a halogen

Typical Grignard reactions

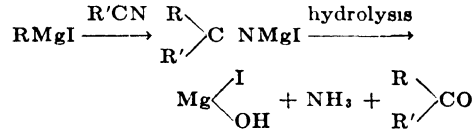
1 Formation of a *hydrocarbon*



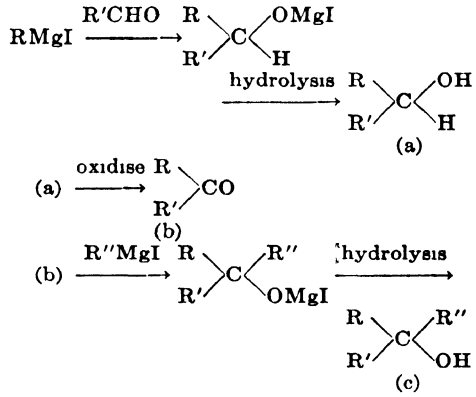
2 Preparation of an *acid*



3 Preparation of a *ketone*



4 Preparation of a *secondary alcohol* (a), *ketone* (b), or *tertiary alcohol* (c) Polaises reaction



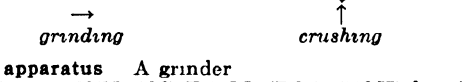
grindelia Gum plant, tar weed The dried leaves and flowering tops of *Grindelia* species, a Compositae used as an antispasmodic and anticatarrhal

grindeline An alkaloid from *Grindelia robusta*, colorless crystals

grindeloid The combined principles of *Grindelia* species, containing an alkaloid resin and oily substance

grinder A power-operated device for pulverizing materials by grinding Cf *crusher, mill*

grinding The process of powdering a substance by lateral motion, as opposed to perpendicular motion (crushing)



g apparatus A grinder

griphite $8[(NaAlCaFe)_3Mn(PO_4)_2\ 5(OH)_2]$ A native hydrophosphate of the garnet type

griserin Sodium lorinate

grm An abbreviation for gram

grog Broken bricks, or burnt ground fireclay, used as a refractory

Grossmann reagent An ammoniacal solution of dicyandiamidine sulfate, $(C_2H_6ON_4)_2H_2SO_4$,

which gives a yellow precipitate with traces of nickel

grossularite A pale green calcium aluminum garnet

Grotthus' law Radiation must be absorbed in order to produce a reaction

ground Powdered or pulverized **g cherry** Physalis **g nut** Arachis **g wood** Mechanical pulp

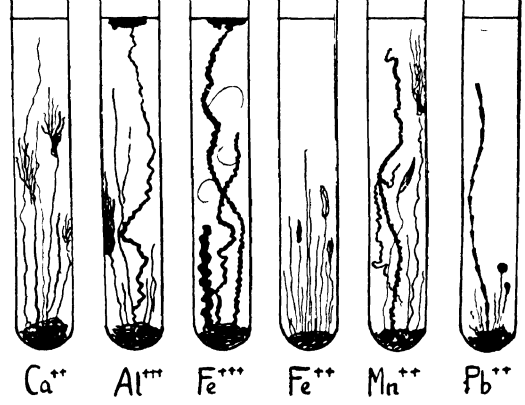
ground-nut oil Arachis oil

group (1) A number of elements having similar properties *e g*, the alkali metals See *periodic system* (2) A number of atoms that pass through a series of reactions unseparated See *radical* (3) A number of elements with similar reactions See qualitative *analysis* **functioning-** A g which has a replaceable hydrogen, as, —OH, —CHO, —NH_2, —SO_3H Cf *Beilstein, derivative* **negative-** A negatively-ionised atom of an acid radical, *e g*, SO_4 **nonfunctioning-** A g which has no replaceable hydrogen Beilstein mentions seven —F, —Cl, —Br, —I, —NO —NO_2, —N_3 Cf *derivative* **positive-** A positively-ionised atom of a metal or radical, *e g*, NH_4

g precipitant A reagent which precipitates elements of the same group, *e g*, H_2S, NH_4OH **g properties** The properties of elements belonging to the same group, *e g*, those characteristic of a vertical division of the periodic system as opposed to period properties **g reaction** The precipitation of elements in a definite analytical group, *e g*, salts of Ag, Hg, Pb by HCl etc **g relation** The relation among elements of a group (vertical division) of the periodic system

Grove, Sir William Robert (1811–1896) British scientist, noted principally for the Grove voltaic cell **G cell** A voltaic cell consisting of amalgamated zinc in sulfuric acid (d 1 136) and platinum in concentrated nitric acid (potential, 1 91 volts)

growth An increase in size **bacterial-** The appearance of a bacterial colony after incubation, see *arborescent, beaded, brittle, bullate, butyrous, coriaceous, cretaceous, curled, echinulate, effuse, erose, filamentous, filiform, floccose, fimbriate, lobate, membranous, mycelioid, napiform, pulvinate, punctiform, raised, rhizoid, rim, ring* **colloidal-** A phenomenon observed when a few crystals of any soluble metallic salt (whose silicate is insoluble) is placed in a 50 % solution of waterglass Each metallic salt produces within a few minutes its characteristic structure as a result of osmotic pressure and the breaking of the insoluble membrane of metal silicate Previous addition of small amounts of sodium carbonate or phosphate to the waterglass effects a change of structure Most active are the salts of Fe, Ni, Co, Mn, Al, Mg, Ca Ba, etc , least active are Cu, Pb, U See figure **inorganic-** The aggregation of solid particles, either by (1) crystallization, (2) periodic precipitation, or (3) colloidal growth



Colloidal growth, about ½ natural size

g factor A supposed vitamin (q v), the absence of which hinders the growth of *Lactobacillus casei*

grumose Clotted

grundy Granulated pig iron

grunerite $Fe_7H_2(SiO_3)_8$ The mineral found in Massachusetts

guachamacine Gauchamacine An alkaloid from *guachamaca*, the bark of *Malouetia nitida*, an Apocynaceae of Venezuela It is said to have properties like curarine, and is used by the natives as a virulent arrow poison

guacin A resin extracted from the leaves of *Mikania guaco*, said to be isomeric with eupatorin The leaves are used by South American natives to cure snake bites

guaethol Thanatol

guaiac The resin from the wood of *Guaiacum officinale*, a Zygophyllaceae of South America and the West Indies **g resinic acid** $C_{20}H_{26}O_4$ = 330 3 Yellow crystals An acid of guaiac **g wood** Lignum vitae, guaiaci lignum The heartwood of *Guaiacum* species, used as a dye **g wood oil** The essential oil of g d 0 965–0 975, soluble in alcohol It contains triglic aldehyde **g yellow** The coloring matter of guaiac wood, pale yellow crystals

guaiacene C_5H_8O = 84 0 Triglic aldehyde A clear, oily liquid obtained by distillation of guaiac wood

guaiacic acid $C_6H_8O_3$ = 128 1 An acid of guaiac

guaiaci lignum Guaiac wood

guaiacin $C_{14}H_{24}O$ = 208 3 An alcohol, the odorous principle of balsam wood Colorless crystals, m 91, soluble in alcohol, used in perfumery

guaiacol $C_7H_8O_2$ = 124 1 Methylpyrocatechin, o-methoxyphenol, o-hydroxyanisole, *1*-hydroxy-*2*-methoxy benzene A phenol ether, $C_6H_4(OH)OMe$, in wood tar Colorless prisms, $d_{15°}$ 1 140, m 32, b 205, soluble in water, alcohol, or ether Used as a reagent in detecting lignin, narceine, chelidonine, nitrous acid and acacia, and medicinally, as an antiseptic **allyl-** *4*-Eugenol *5*- Chavibetol **cinnamyl-** Styracol **methyl-** Creosol **methylenedi-** Pulmoform **propenyl-** Isoeugenol **vinyl-** Hesperetol

g acetate $C_9H_{10}O_3$ = 166 1 Eucol A colorless fluid, d 1 138, b 238 **g benzoate** Benzosol **g benzylic ether** Benzeain **g biniodide** $C_7H_6O_2I_2$ = 374 7 A reddish-brown powder, used medicinally in tuberculosis **g cacodylate** Cacodilacol A reddish-brown crystalline compound, used medicinally **g. carbonate** $(C_7H_7O)_2CO_3$ = 274 1 A white crystalline powder, m 87, soluble in ether, slightly soluble in alcohol, insoluble in water Used as a tasteless and non-irritant substitute for g **oleate** Oleoguaiacol A mixture of g and oleic acid in ether **g valerate** Creosote

guaiaconic acid $C_{20}H_{24}O_5$ = 344 2 A resinous acid, derived from guaiac An amorphous brown powder, used in the guaiac test for blood

guaiacum Guaiac

guaiacyl (1) o-Anisyl (2) $[C_6H_3(OH)(OCH_3)\text{-}SO_3]_2Ca$ Calcium-o-guaiacolsulfonate, guajacyl A bluish-gray powder, soluble in water or alcohol, used medicinally as a local anesthetic

guaiaretic acid $C_{20}H_{26}O_4$ = 330 22 An acid from guaiac

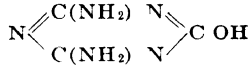
guaiene $C_{12}H_{12}$ = 156 09 *2 3*-Dimethylnaphthalene* Colorless liquid, d 1 008, m −20, b 266, insoluble in water Cf *guajene*

guaiol Tiglic aldehyde

guaj A variant of *guai*

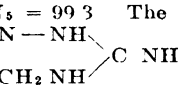
guajene $C_{15}H_{24}$ = 204 19 A liquid hydrocarbon, d 0 8954, b 124, from guaiac Cf *guaiene*

guanamine A compound containing the trivalent =N C(NH$_2$) N C(NH$_2$) N— group, as **acet-** $C_4H_7N_3$ = 97 2 Colorless crystals, m 265 **formo-** $C_3H_5N_5$ = 111 08 The heterocyclic system



guanase An enzyme converting guanine into xanthine, found in thymus, adrenals and pancreas

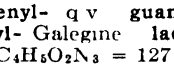
guanazole $C_2H_5N_5$ = 99 3 The heterocyclic compound



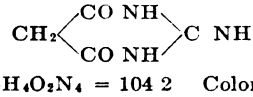
Colorless crystals, m 206

guanazyl The bivalent —N NC(N NH CNH-NH$_2$)— radical g **benzene** $Ph_2C_2H_4N_6$ = 266 3 Colorless crystals, m 199

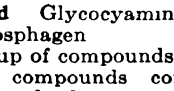
guanidine CH_5N_3 = 59 17 Carbamidine, aminomethanamidine*, carbondiamide imide, uramine, $(NH_2)_2C(NH)$ Colorless crystals, soluble in water or alcohol It is an isolog of urea Cf *synthalin* **amidophenol-** See *amidophenolguanidine* **aminobutyl-** Agmatine **benzoylene-** q v **bi-** Guanylguanidine **carbamyl-** Guanylurea **cyan-** $C_2H_4N_4$ = 84 06 Dicyandiamide, param



Colorless crystals m 205 **decamethylenebis-** Synthalin **diphenyl-** q v **guanyl-** Biguanidine **isopentenyl-** Galegine **lactyl-** Alacreatine **malonyl-** $C_4H_5O_2N_3$ = 127 2 The heterocyclic system



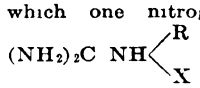
nitro-* $CH_4O_2N_4$ = 104 2 Colorless crystals, m 240 **nitroso-** CH_4ON_4 = 88 2 $NH_2C\text{-}NH\ NH\ NO$ **oxalyl-** $C_3H_3O_2N_3$ = 113 2 The heterocyclic system



g acetic acid Glycocyamine **g phosphoric acid** Phosphagen

guanidines A group of compounds derived from guanidine, *e g*, compounds containing the =N C(NH) N= radical, as methylguanidine, $NH_2CNH\ NHMe$ See *creatine, glycocyamine, guanidine*

guanidinium A salt derived from guanidine, in which one nitrogen atom is pentavalent



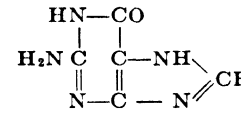
guanidino phosphoric acid. Phosphagen

guanido The monovalent —NH C(NH)NH$_2$ radical

guanidoacetic acid Glycocyamine **methyl-** Creatine

guanidopropionic acid Alacreatine

guanine $C_5H_5ON_5$ = 151 27 Imidoxanthine, 2-amino-6-oxypurine, 2-aminohypoxanthine,



A leucomain found in guano, excrements of spiders, scales of fishes swine, human liver, pancreas and spleen, and formed as a decomposition product of nucleins Colorless needles, decomp above 360, insoluble in water, soluble in alcohol, ether, or alkalis

guano Bird manure The partly decomposed excrements of sea birds found on the islands off the Western Coast of South America, especially Peru It is an excellent fertilizer and a source of guanine

guanoline $C_4H_9O_2N_3$ = 131 1 Guanidocarbonic ethylester Colorless crystals, m 114

guanosin $C_{10}H_{13}N_5O_5$ = 283 4 A pentoside in the pancreas **g phosphoric acid** Guanylic acid

guanyl The monovalent radical, —C(NH)NH$_2$ **g guanidine** $C_2H_7N_5$ = 101 3 Biguanide $NH_2C(NH)NH\ C(NH)NH_2$ **g urea** $C_7H_6ON_4$ = 100 3 Dicyandiamidine, carbamylguanidine, $NH_2CO\ NH\ C(NH)NH_2$ An isolog of guanylguanidine

guanylic acid $C_{10}H_{13}O_8N_5P$ = 362 4 A nucleic acid consisting of guanosine, phosphoric acid and a pentose, $H_2PO_4\ C_5H_7O_3\ C_5H_4ON_5$, occurring in pancreas, ox liver, and yeast

guarana Brazilian cocoa A dried paste from the ground seeds of *Paullinia sorbilis*, a Sapindaceae, used for migraine **g tannin** Paullinio tannin

guaranine $C_8H_{10}O_2N_4$ = 194 3 An alkaloid resembling caffeine, from guarana

guard tube A tube which usually contains calcium chloride, and is used to prevent access of atmospheric moisture to gas absorption bulbs while they are being weighed Cf *witness*

guavacine Guvacine

guayule The shrub, *Parthenium argentatum*, a Compositae of the Chihuahuan Desert (Mexico), which is cultivated in Central California **g rubber** A commercial rubber made from g by a mechanical process

Guericke, Otto von 1602–1688 A German philosopher noted for experiments with the air pump, vacuum (Magdeburg hemispheres), and hydrometer

Guignet's green $3CrO_3,B_2O_3,4H_2O$(?) A green pigment resulting from the fusion of potassium dichromate and crystalline boric acid

guinea green $C_{37}H_{35}N_2O_6S_2Na$ A dye used as food color and hydrogen ion indicator, changing at pH 6 0 from magenta (acid) to green (alkaline)

Guldberg, Cato 1836–1902 A Norwegian chemist **G rule** The boiling point of a liquid is ⅔ the critical temperature (°A) of the gas **G and Waage law** Mass law, law of mass action, law of chemical kinetics The velocity of a reaction is proportional to the active masses of reacting substances, velocity =

amount transformed/time See *mass law* **G Guye rule** The critical temperature of a substance is about 3/2 of the absolute boiling point $T_c/T_b = 1.5$ (varying from 1.4 to 1.9)

gulonic acid $C_6H_{12}O_7 = 202.1$ A monobasic acid derived from gulose

gulose $C_6H_{12}O_6 = 180.2$ A hexose, isomeric with glucose

gum A thick, mucilaginous excretion from various plants, consisting of complex carbohydrates which yield sugars on hydrolysis They are the products of disintegration of internal tissues, and exude from the stems, they dissolve or swell in water, and are insoluble in and precipitated by alcohol

Classification

A Arabin-type completely soluble in water

Acacia senegal	gum arabic
Piptadenia rigida	angico gum
Piptadenia cebil	cebil gum
Prosopis juliflora	mesquite gum
Cedrela australis	cedar gum
Anogeissus latifolia	Indian gum

B Bassorin type slightly soluble in water

Astragalus gummifer	tragacanth
Sterculia species	sterculia
Sterculia urens	hog gum
Feronia elephantum	amrad gum
Chloroxylon swietenia	satinwood gum

C Cerasin type swelling in water

Prunus cerasus	cherry gum
Covillea tridentata	sonora gum
Albizzia fastigiata	sassa gum

acacia- See *acacia* **acaroid-** See *acaroid* **ammoniacum-** See *ammoniac* **angico-** See *angico* **arabic-** See *acacia* **benjamin-** Benzoin **g** (2) **benzoin-** See *benzoin* (2) **blue-** See *eucalyptus* **british-** Dextrin **cebil-** See *cebil* **cedar-** See *cedar* **chewing-** Chicle **chicle-** See *chicle* **doctor-** Hog gum **dragon-** Tragacanth **elastic-** Caoutchouc **gettania-** Guttapercha **guiac-** Guaiac **hog-** See *hog* **Indian-** See *Indian* **kauri-** See *kauri* **ladanum** See *labdanum* **mango-** See *mango* **mesquite-** See *mesquite* **red-** See *gum-tree* **sassa-** See *sassa* **sonora-** See *sonora* **starch-** Dextrin **sweet-** Storax

G arabic Acacia **G benjamin** See *benzoin* (2) **G cistus** See *labdanum* **G copal** Copal **G dragon** Tragacanth **G. elastic** Caoutchouc- **G galbanum** See *galbanum* **G kino** See *kino* **G lac** See *lac* **G olibanum** See *olibanum* **G plant.** Grindelia **G resin** See *gum-resins* **g running** The process of melting gums in varnish manufacture **G sandarach** See *sandarac* **g sugar** Arabinose **G thus** Olibanum **G tragacanth** Tragacanth **g tree** See *gum-tree*

gummeline Dextrin

gummon Trade name for an insulating material of tar and asbestos

gummy Sticky or resembling gum

gum-resins Oleoresins A group of aromatic exudations of plants which consist of a mixture of various substances (as essential oils) with the gum The following are official (U S P) ammoniac, asafetida, gamboge, myrrh, and scammony Cf *resins*

gums The dried gummy exudations of plants, formed by conversion of the cell walls, soluble in water, insoluble in alcohol Acacia, and tragacanth are official (U S P)

gum-tree Red gum, sweet gum A large tree, *Liquidambar styraciflua*, which grows in the swamps of the Mississippi, and yield valuable lumber **blue-** Eucalyptus **cotton-** A tree, *Nyssa sylvatica*, of Asia, which yields timber and an edible fruit

guncotton $C_{12}H_{14}O_4(NO_3)_6 = 594.17$ Cellulose hexanitrate A highly nitrated and sparingly soluble cellulose, used as an explosive **soluble g-** Pyroxylin

gunmetal Bronze An alloy consisting of 90 % copper and approximately 10 % Sn, 2 % Zn, and 1 % Pb, Ni, Sb, Fe, Al, etc

Gunning reagent A 10 % solution of iodine in alcohol, used for detecting acetone in urine **G test** The formation of iodoform by adding Gunning reagent and ammonia to urine, it indicates the presence of acetone

gunny A jute bagging cloth

gunpowder A granulated explosive mixture of about 2 pts charcoal, 3 pts sulfur and 15 pts potassium nitrate Its character depends largely on the size and shape of the grains, their density and hardness, glazing, and moisture-content

Gunter's chain A measurement of length = 20.1168 meters

Günzberg reagent A solution of 1 pt phloroglucinol, 1 pt vanillin in 30 pts alcohol, or two solutions (a) phloroglucinol 1.15, (b) vanillin 1.15, mixed shortly before applying the test Used for detecting free mineral acids **G test** A drop of Gunzberg reagent is carefully evaporated on white porcelain plate, after adding the unknown solution and again evaporating, a pink color indicates the presence of hydrochloric acid

guoethol Thanatol

gur Jaggery A crude Indian sugar obtained by evaporating unclarified cane juice in open pans over fires

gurjun A balsam obtained from several *Dipterocarpus* species of India, used as a varnish **g oil** The essential oil of g, d 0.915–0.925, b 255, containing sesquiterpenes

gutta (pl guttae) The Latin for "drop"

guttameter A device for measuring surface tension by the number of drops formed

guttapercha Gummi plasticum $(C_{10}H_{16})_2$ A group of hydrocarbons consisting of the purified and coagulated milky exudate of various trees of *Palaquium* species, (Sapotaceae) Colorless masses, sticks, or sheets, usually yellowish with red streaks, insoluble in water, partly soluble in chloroform, benzene, oil of turpentine It consists of hydrocarbons, fluavil, alban and a volatile oil It softens at 65°C, and burns with a bright flame Used for insulating purposes, in dentistry, and as a rubber substitute

Gutzeit, Heinrich Wilhelm 1845–1888 A German chemist noted for analyses of vegetable products **G test** A test for arsenic performed by adding zinc and dilute sulfuric acid to the substance in a test tube, covering the tube with a filter paper moistened with mercuric chloride solution and observing the formation of a yellowish spot on the filter paper, due to $AsH(HgCl)_2$ This turns black with the formation of $As(HgCl)_3$, and then As_2Hg_3

G w a Grams of water in air See Mohr *liter*

guvacine $C_6H_9O_2N = 127.1$ An alkaloid, m- 271, from the betel nut, the fruit of *Areca catechu*, an East Indian palm, used medicinally as an anthelminthic

Guyton de Morveau, Louis Bernard 1737–1816 A French lawyer who made chemistry a hobby, and introduced the first nomenclature, promoted the antiphlogiston theory and translated many books

gymnemic acid $C_{32}H_{56}O_{12}$ = 631 4 The active constituent of *Gymnema sylvestre*, an Asclepiadaceae of Australia, India and Africa

gymnosperm A large group of plants in which the seeds are not enclosed in an ovary *e g* , the conifers Cf *angiosperm*

gynergen $C_{70}H_{76}N_{10}O_{16}$ = 1313 13 Ergotamine tartrate Colorless crystals, decomp 180, soluble in water or alcohol A constituent of ergot, increases the blood pressure

gynesin $C_{19}H_{23}O_3N_3$ = 341 4 A basic substance isolated from urine from females

gynocardic acid (1) $C_{18}H_{34}O_2$ = 282 2 An acid from the oils of *Gynocardia odorata* and *G Prainii*, m 67, insoluble in water (2) A mixture of unsaturated acids from gynocardia and chaulmoogra oils, containing hydnocarpic, taraktogenic and gadoleic acids

gynocardine $C_{13}H_{19}O_9N$ = 333 15 A glucoside, m 162, from the seeds of *Gynocardia odorata* It yields on hydrolysis glucose, HCN and $C_6H_8O_4$ Cf *chaulmoogra oil*

gynoval $C_{15}H_{26}O_2$ = 238 3 The isovaleric ester of isoborneol $MeCHMeCH_2COOC_{10}H_{17}$ A colorless neutral liquid of peculiar aromatic odor, d 0 952–0 957, b 135, used medicinally as a hypnotic and sedative

gypsum Selenite A native hydrated calcium sulfate (q v) or plaster of Paris (q v) Cf *anhydrite*

gyration Revolving in a circle.

gyrophoric acid $C_{16}H_{14}O_7$ = 318 11 An acid from the lichen, *Gyrophora vellea*

H

H (1) The symbol for hydrogen, H^+ hydrogen ion, H^* excited hydrogen atom, H_2 hydrogen molecule, H_2^+ ionized hydrogen molecule, H_2^* excited hydrogen molecule H^1 or H^a hydrogen isotope of mass 1, protium H^2 or H^b hydrogen isotope of mass 2, deuterium H^3 or H^c hydrogen isotope of mass 3, tritium (2) The symbol for the unit of strength of a magnetic field (gauss) (3) Henry, the unit of inductance (4) The symbol for enthalpy (q v) **H acid** 8-Amino-1-naphthol-3,6-disulfonic acid **H ion** See *hydrogen-ion* **H line** (1) The spectrum lines due to hydrogen, as,

Hα or Fraunhofer line C	λ 6573	(red)
Hβ or Fraunhofer line F	λ 4861	(blue)
Hγ or Fraunhofer line G	λ 4340	(blue)
Hδ or Fraunhofer line h	λ 4101	(violet)

(2) The Fraunhofer line H, λ 3968, due to calcium **H M** Abbreviation for heavy metals **H rays** A stream of hydrogen nuclei, they can be detected by electrometer or photographic plate **H salt** The sodium salt of H-acid

h An abbreviation for (1) hour, (2) height, (3) hundred, (4) hetero-

h Planck's constant (q v), or (6 559 ± 0 008) × 10^{-27} erg-seconds

H and D Abbreviation for Hurter and Driffield curve, the basis of measurement of the sensitiveness of photographic materials It is obtained by plotting log (exposure time) against the density of the photographic negative produced by the exposure

ha Abbreviation for hectare

Haber, Fritz 1868–1934 A German chemist and Nobel prize winner **H process** A method of producing ammonia synthetically from nitrogen and hydrogen in presence of a catalyzer Cf *nitrogen fixation*

habitat The abode or region in which a living organism, either plant or animal, is located or found **abyssal-** A h in the deep sea **alpine-** A h in high mountains **fossorial-** A h in burrows and caves **littoral-** A h near the shores **pelagic-** A h in the open sea

Hackh symbols Structure symbols **H 's table** See *periodic table* **H theory** The atomic nucleus consists of I neutrons, and A positrons, where I is the isotopic mass and A the atomic number

Hadfield, Sir Robert 1859–1940 A British metallurgical chemist, noted for the development of stainless steels **H process** A metal oxide is reduced by heating with granulated aluminum and fluorspar in a crucible

hadromal Ferulaldehyde

hæ- See *hae-, he-*

haem $C_{34}H_{35}O_3N_4Fe$ The essential unit of the group of cellular and blood pigments, related to aetioporphyrin

haema-, haemo- A prefix indicating a relationship to blood, see *hema-, hemo-*

haemanthine $C_{18}H_{23}O_7N$ = 365 19 An alkaloid from buphane

haematoxylin Hematoxylin

haematoxylon, hematoxylon (a) A genus of leguminous trees of Central America, specifically *H campechianum* (b) The heart-wood of *H campechianum*, log-wood or campeachy wood, which contains a purple-red coloring material, hematoxylon, also used as an astringent

Haeser's coefficient The number 2 33, with which the last two figures of the specific gravity of urine are multiplied in order to obtain the amount of solids in 1000 cc of urine Cf *Haine's coefficient*

haeterolite The mineral ZnO Mn_2O_3

hafnium Hf = 178 6 Celtium, Ct Oceanum An element of the carbon group, atomic number 72, discovered in 1924 by Coster and Hevesy in zirconium minerals It has a valency of 4, d 13 31, m 2500, and occurs in thortveitite, zircon and baddeleyite **h carbide** HfC = 190 6 A gray powder, m 3887 A mixture of 25 % HfC and 75 % TaC has the highest known melting point of 4200°C **h hydroxide** $Hf(OH)_4$ = 246 6 A white powder, insoluble in water **h oxide** HfO_2 = 210 6 A white powder, m 3025 insoluble in water, soluble in acids **h oxychloride** $HfOCl_2$ = 265 6 A white powder, insoluble in water, soluble in hydrochloric acid **h sulfate** $Hf(SO_4)_2$ = 370 6 A white crystalline powder, soluble in water

Hahn, Otto 1879– A German physical chemist, noted for his work on radium

Hahnemann's mercury Soluble mercury

Haine's coefficient The number 1 1, which when multiplied by the last two figures of the specific gravity of urine, gives the amount of solids in grains for each fluid ounce Cf *Haeser's coefficient*

hairari root The roots of *Lonchocarpus* species containing rotenone Cf *cubé root*

halazone $C_7H_5O_4NSCl_2$ = 269 9 p-dichloramidobenzo-sulfonic acid, $C_6H_4(SO_2NCl_2)$-COOH A white powder with a strong chlorine odor, m 213, soluble in water or chloroform, used as an antiseptic

half period The period in which the activity of a radioactive substance decreases to half of its initial value It varies from 3 × 10^{10} years (thorium) to 0 002 sec (AcA)

half-stuff A pulp intended for paper-making, before it goes to the paper-making machine

halide A binary compound of the general type MX, MX_2, or MX_3, in which M is a metal, X a halogen (F, Cl, Br, I) **acid-** A compound of the type R COX **alkylaryl-** A compound of the type RX, where R is an alkyl or aryl radical **magnesium-** A compound of the type RMgX, *e g* Grignard's reagent

h lamp An alcohol torch with copper tube, which ordinarily burns colorless but gives a green flame in presence of organic halides, used to detect leaks in refrigerators using halides as refrigerants

halite A native sodium chloride

haliver oil Halibut liver oil, which is rich in vitamins A and D

Hall, Arthur Daniel, Sir 1864–1942 A British agricultural chemist **H, Carl von** 1819–1880 An Austrian chemist, noted for work on vanadium compounds **H, Charles M** 1863–1914 An American chemist noted as inventor of the electrolytic aluminum process

H effect Galvanomagnetic difference of potential A difference of potential is produced in a metal plate placed transversely between two magnetic poles, when the electric current passes from left to right, and the upper edge of the metal plate becomes positive, the effect is called positive **H formula** If E is the difference of potential between the lower and upper edge of the metal plate of thickness t, then $E = R(Hi/t)$, where R is a constant specific for different metals, H the magnetic field strength in gausses, and i the electric current in C G S units

Hall purinometer A graduated glass tube of special construction, used for the determination of purine bodies in urine

Hallwachs effect Photoelectric effect

halloylite Halloysite

halloysite $Al_2O_3\ 2SiO_2\ nH_2O$ Halloylite A refringent, micaceous silicate constituent of clay

halo (1) A series of luminous concentric circles around a source of illumination caused by the refraction of light in passing through solid or liquid particles suspended in the atmosphere (2) A circular photographic image produced when x-rays pass through an *amorphous* substance Cf *x-ray crystallogram*

halo- A prefix indicating the presence of a halogen, as haloplatinates

halochromism (1) The formation of colored salts from colorless organic bases by the addition of acids Cf *solvatochromism* (2) The production of colorless solutions in some solvents and colored solutions in others

haloform A compound of the type CHX_3, as, chloroform **h reaction** The reaction analogous to that by which iodoform is made from alcohol or acetone

halogen The non-metallic elements of the seventh group of the periodic system F, Cl, Br, and I Halogens are multivalent and have a valence number of −1 (*e g*, chlorides), 1 (*e g*, hypochlorites), 3 (*e g* chlorites), 5 (*e g*, chlorates), and 7 (*e g*, perchlorates) **h acids** The hydrogen compounds of the halogens HF, HCl, HBr, and HI

halogenide A compound containing a halogen

halophile A bacterium which can grow in saline media

halogenation The introduction of a halogen into an organic compound, either by addition or substitution, as chlorination or bromination

halohydrin An organic compound of the type X—R—OH, as Cl—CH_2 CH_2 OH, where X is a halogen

haloid Resembling or derived from halogens, as, chlorohydrin, bromohydrin **h acid** An inorganic acid, HX, containing a halogen but no oxygen **h elements** The halogens

halowax $C_{10}H_7Cl$ = 762 51 β-chloronaphthalene Colorless solid, m 56, b 264, used in gasoline to lubricate valve-stems in internal combustion engines

Halphen reagent A solution of sulfur (1 %) in carbon disulfide, used for the H test for cotton-seed oil **H test** To 1 cc of oil add 1 cc of H reagent and 1 cc of amyl alcohol and heat in a brine bath for 30 mins, 1 % of cotton-seed oil gives a red color

hamamelidin An extract from *Hamamelis virginiana*, witch-hazel, used as a tonic

Hamamelidaceae Witch-hazel family, a group of trees or shrubs which yield the following drugs

Hamamelis virginiana	witch-hazel
Liquidambar orientalis	storax
Liquidambar styraciflua	sweet gum

hamamelin A precipitate from the extract of the bark of *Hamamelis virginiana*, used as a tonic and astringent

Hamamelis A genus of trees or shrubs, *e g*, witch-hazel, whose leaves or barks are used as tonic and sedative

hamamelitannin $C_{20}H_{20}O_{14}\ 6H_2O$ A tannic acid from the bark of witch-hazel Fine white needles, m 115, soluble in hot water alcohol or acetone

hamartite Bastnasite

hamathionic acid Euxanthic acid

hand An obsolete unit of length 1 hand = 4 inches = 10 16 cm

hanfangchine $C_{36}H_{40}N_2O_6$ = 596 4 An alkaloid from the Chinese plant han-fang-chin, *Cocculus japonicus*, the root of which is used for cholera and pulmonary diseases

Hanovia lamp An evacuated quartz tube with two mercury reservoir electrodes, used to produce mercury vapor radiations rich in ultraviolet light

Hantzsch, Arthur 1857–1935 A German organic chemist noted for studies of the stereochemistry of nitrogen compounds

Hanus solution A solution of iodine monobromide in glacial acetic acid, used in the determination of iodine values of fats and other materials containing unsaturated organic compounds

haptaphore The chemical group which unites with the amboceptor

hapten(e) An alcohol-soluble substance present in the organs of various animal species, capable of producing anti-bodies *in vitro* but devoid of antigenic properties

haptin A receptor in Ehrlich's side chain theory (q v)

haptogen The protein substance constituting the membrane surrounding the globules of fat in milk

hard (a) Firm or resistant (b) A condition of water, due to the presence of calcium and magnesium salts (see *hardness*) **h salt** Hartsalz

Harden, Sir Arthur 1865–1940 A British biochemist, noted for his work on yeast and fermentation **H-Young ester** Fructose diphosphate, produced in the fermentation of sugar by yeast

hardening A process which makes a material more resistant to cutting, breaking or bending **-of fats** Hydrogenation **-of steel** Tempering

hardness (1) The state or quality of being hard The resistance in differing degrees to cutting, bruising, scratching or grinding Cf *penetrometer*, *sclerometer*, *Keen tester* (2) The presence of calcium and magnesium salts in water (usually carbonates and bicarbonates), which causes incrustations in boilers, and im-

pairs the lathering qualities of soap These salts combine with the fatty acids of the soap, and form insoluble soap salts **Brinnell-** See *Brinnell hardness* **Moh's-** See *h scale* **Shore-** See *Shore*

h scale Moh's scale An empirical scale of minerals arranged so that each substance will scratch the preceding one in the list

1	talc, kaolin	6	feldspar, augite
2	rocksalt, alum	7	quartz, agate, flint
3	calcite, serpentine	8	topaz, beryl
4	fluorite, marble	9	corundum
5	apatite, asbestos	10	diamond

N B finger nail—2 5 penknife—6 5

Extended or new Moh's scale

6	*orthoclase, periclase*	*12*	*fused alumina, tungsten carbide*
7	*vitreous pure silica*		
8	*quartz, stellite*	*13*	*silicon carbide*
9	*topaz*	*14*	*boron carbide*
10	*garnet*	*15*	*diamond*
11	*fused zirconia, tantalum carbide*		

h of water A measure of the calcium and magnesium content of water, as *permanent-* The presence of magnesium or calcium sulfate or carbonate or other calcium salts (except bicarbonates) in water These salts cannot be removed by simple boiling and must be removed by chemical treatment (see *permutite*) *temporary-* The presence of magnesium or calcium bicarbonate in water, the water is softened by boiling, as insoluble calcium carbonate is formed $Ca(HCO_3)_2 = CaCO_3 + CO_2 + H_2O$ *total-* The total amount of calcium and magnesium salts in water, expressed in degrees of hardness

English degree of hardness = 1 grain $CaCO_3$ in 1 gallon H_2O, or 1 mg $CaCO_3$ in 70 gram water = 1 Clark degree

German degree of hardness = 1 pt CaO or MgO in 100,000 pt H_2O, or 1 mg CaO in 100 gm water

French degree of hardness = 1 pt $CaCO_3$ in 100,000 pts H_2O, or 1 mg $CaCO_3$ in 100 gm water

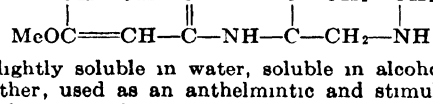
Hare, Robert 1781–1858 An American chemist noted for work on the oxy-hydrogen flame, colorimeter, gas analysis and artificial graphite

Hargreaves-Bird cell An electrolytic cell for the manufacture of chlorine and caustic soda from brine The cathode is copper gauze, and the anode gas carbon on a lead core

Harkins, William Draper 1873– An American chemist noted for research on isotopic weights and atomic structure **H theory** The atomic nucleus consists of He and H kernels, and those containing even numbers are the more stable Cf *Hackh theory*

harmala red A red dye from harmel, used in the Orient

harmaline $C_{13}H_{14}ON_2 = 202\ 09$ Harmine dihydride 3,4-dihydroharmine An alkaloid from the seeds of *Peganum harmala*, a Rutaceae of the steppes of Southern Russia and Turkey Trimetric, octahedric, colorless crystals, m 238,



slightly soluble in water, soluble in alcohol or ether, used as an anthelmintic and stimulant Cf *turkey red*

harman Aribine

harmel The wild rue, *Peganum harmala*, the commonest weed of the Russian and Turkish steppes, used as a vermifuge Its seeds contain the alkaloids harmaline, harmine and aribine Cf *harmala red*

harmine $C_{13}H_{12}ON_2 = 212\ 0$ Yajeine An alkaloid from the seeds of *Peganum harmala* **3 4-dihydro-** Harmaline **h dihydride.** See *harmaline, banisterine, yajenine*

harminic acid $C_{10}H_8O_4N_2 = 220\ 1$ A crystalline acid obtained by the oxidation of harmine or harmaline

harmonic progression A series whose terms are the reciprocals of an arithmetic progression

harmony The adaptation of component parts to a state of equilibrium, or a joining or fitting together, as, the harmony of milk

Harrison Narcotic Act (U S A) An Internal Revenue regulation to govern the production, importation manufacturing, compounding, dispensing selling, or giving away of opium or coca leaves, their salts, derivatives or preparations

hartin $C_{20}H_{34}O_4 = 338\ 3$ A substance found in fossil wood or in lignite Cf *hartite*

hartite $(C_6H_{10})_x$ A hydrocarbon found with hartine in lignite and fossil wood

Hartman's solution A solution of 12 5 gm thymol, 10 gm ethyl alcohol and 20 gm sulfuric ether Used to desensitize dentin selectively, it burns the flesh

hartsalz A mixture of sylvinite and kainite, used as a fertilizer (16 % K)

hartshorn Spirit of hartshorn A popular name for ammonia water **h salt** A popular name for ammonium carbonate, q v

harvel coating A paint made with cashew nut oil, used for waterproofing materials, *e g*, cement, wood, etc

hashish The dried leaves and stalks of *Cannabis indica* (q v), used as a narcotic by the races of India

hatchettenine Rock tallow A white or yellow native waxy hydrocarbon of the type C_nH_{2n+2} It is amorphous, and is soluble in ether

hausmannite A native manganese oxide, Mn_3O_4, or mangano-manganite, Mn_2MnO_4, dark brown masses

hawthorn The fruits of *Crataegus oxycantha*, a Rosaceae used as a cardiac and tonic

hay fever extract Pollen extract

Hayem solution A solution consisting of 5 pts sodium sulfate, 1 pt sodium chloride, 0 5 pt mercuric chloride and 200 pts water, used in the microscopical analysis of blood

hazard The danger to life or property caused by improper or neglectful handling of chemicals Hazards fall into two groups,

LIFE HAZARDS

1 Materials which are corrosive or caustic (Acids, bases)
2 Materials which are poisonous (Alkaloids, etc)
3 Materials which emit suffocating vapors (Bromine)
4 Materials which form irritating gases
5 Materials which produce toxic fumes when heated
6 Materials which are highly explosive

FIRE HAZARDS

1 Substances which are combustible or inflammable
2 Substances which are explosive
3 Substances which form inflammable vapors
4 Substances which form inflammable dusts
5 Substances which ignite by friction
6 Substances which ignite with water
7 Substances which produce a combustible gas with water
8 Substances which produce explosive mixtures with water
9 Substances which are oxidizing agents, and which may ignite or explode in contact with organic substances
10 Substances which may cause spontaneous combustion

hazardous chemicals A group of materials which may cause loss of life or property by improper handling, shipping, or storing Cf *explosives, poisons, compressed gases, storage, shipping, label* and the following tables

hb An abbreviation for hemoglobin

H C A mixture of Zn and herachloroethane used to produce artificial smokes in warfare

HCN discoids Wood-pulp or filter paper disks impregnated with liquid hydrocyanic acid and used in fumigation Cf *zyklon*

He The symbol for helium

heart sugar Inositol

heat A form of energy which can be transmitted from one body to another by (a) radiation, *e g*, vibrations or waves in the ether which, when stopped by a substance, cause the molecules of that substance to vibrate faster, and so produce the effect of heat (b) By contact, where the molecular vibrations are transmitted directly by conduction and convection It is supposed that all bodies possess molecular vibrations to varying extents at ordinary temperatures, and that at −273°C, the absolute zero, these vibrations cease **animal-** The heat evolved during the life processes of an animal by oxidation of carbonaceous materials to carbon dioxide **atomic-** The amount of heat required to raise the temperature of a gram-atom of substance from 0°C to 1°C **latent-** The heat absorbed by a substance which does not cause a rise in its temperature, as h of fusion, h of evaporation The heat is used to produce a change of state, *e g*, liquid to vapor **mechanical equivalent of-** See *h equivalent* **molecular-** The amount of heat required to raise the temperature of one mole of a substance by one degree centigrade, *i e*, the specific h of a substance multiplied by its molecular weight Cf *Kopp's law* **radiant-** Heat waves transmitted through space **radioactive-** Heat evolved during radioactive decomposition **specific-** The amount of heat required to raise one gram of a substance through one degree centigrade under specific conditions (see *calorie*)

h capacity The amount of heat required to raise the temperature of a body 1°C, usually expressed in calories *atomic-* Specific heat Cf *Dulong and Petit law molecular-* Cf *Kopp's law* The molecular heat capacity is the sum of the atomic heat capacities **h conductivity** The number of calories transmitted per second through a plate one centimeter thick across an area of one square centimeter when the temperature difference is one degree centigrade If Q is the conductivity, $Q = k\frac{(t_2 - t_1)aT}{d}$ where k is a constant, depending on the nature of the substance, t_1 and t_2 the temperatures of the two bodies, a the area, and d the thickness of the conductor, and T the time in seconds *specific-* The constant k in the above equation **h degree** The intensity of heat (see *thermometer scale*) The entire absence of h is considered the "absolute zero" or "zero-degree," which equals −273 13°C, −459 60°R or 0°K **h effect** Joule effect The number of calories developed by an electric current in a metallic circuit It is proportional to the quantity of electricity (in coulombs) multiplied by the fall in potential (volts), thus

$$H = \frac{(\text{Coulombs} \times \text{Volts})}{4\ 181 \text{ small cal}} = \frac{\text{Watts}}{4\ 181}$$

where H is expressed in small calories, or $H = ri^2t/4\ 181 = Eit/4\ 181$, where r is the internal resistance, i the electric current equal to E/R, or the electromotive force divided by the total resistance ($i = E/R + r$), and t the time in seconds, (cf *Peltier effect*) **h engine** An arrangement for converting heat into work **h equivalent** A factor used to convert heat into energy units 1 mean calorie = $4\ 1816 \times 10^7$ ergs, 1 calorie (15°C) = $4\ 1809 \times 10^7$ ergs The conversion factors for the gas constant, (q v) are

R = 82 07 cc atm per degree
= 1 9885 calories per degree
= 8 316 joules per degree

h function When a system passes from one state to another the heat absorbed is the difference of a function (known as the heat function, W) for the initial and final states At constant pressure, $W = U + pu$, where U is the intrinsic energy, p the pressure and u the volume **h index** Maumené number The rise in temperature produced by mixing 50 cc of an oil with 10 cc of conc sulfuric acid It is expressed in degrees centigrade and used to evaluate oils **h number** H index **h of activation** H involved in catalytic processes **h of absorption** The quantity of heat consumed or liberated when a gaseous substance is dissolved **h of adhesion** The quantity of h consumed or liberated in the formation of heterogeneous mixtures, *e g*, rubber with filler **h of admixture** H of mixing **h of adsorption** The quantity of heat liberated when a substance is adsorbed or condensed on the surface of a solid, as hydrogen gas on platinum sponge **h of aggregation** The h involved in the formation of aggregates, as *h of condensation, h of cooling, h of crystallization* **h of association** The quantity of h needed to form co-ordinate compounds **h of combination** *H of formation* or *h of hydration* **h of combustion** The number of calories liberated per gram-atom or gram-molecule when an element or compound, respectively, is completely oxidized **h of compression** The heat produced when a gas is compressed **h of condensation** The reverse of h of evaporation (q v) **h of cooling** The h liberated at a certain temperature during cooling, it indicates the existence of an allotropic rearrangement **h of crystallization** The number of calories liberated or absorbed per

COMMON HAZARDOUS CHEMICALS

(Condensed from Reports by the Committees of National Fire Protection Association U S A , and the American Chemical Society)

	Life hazard	Fire hazard	Storage	Shipping container	I C C * label
Acetic acid		3	Away from Ox M	Carboys, barrels	w
Aluminum dust		4	Dry	Barrels, boxes	
Ammonium perchlorate		2	Away from acids	Barrels, bottles	y
Barium chlorate	p	9	Isolate	Boxes, barrels	y
Barium peroxide	p	8	Away from Comb M	Metal containers	y
Borneol		3	Ventilated	Barrels, tins	
Bromine	s	9	Isolate	Glass, earthenware	w
Butane		3	Cool	Steel cylinders	r
Caesium nitrate	p	9	Dry	Kegs, bottles	y
Calcium carbide		7	Dry	Kegs, drums	
Calcium chlorate		9	Away from Comb M	Iron or glass	
Camphor, camphene		3	Cool, ventilated	Tins	y
Charcoal		10	Isolate	Boxes, barrels	y
Chinese wax		1		Burlap, barrels	
Chromic acid	p	9	Isolate	Metal or glass	y
Cobaltous nitrate		9		Barrels	y
Colophony		1	Cool, ventilated	Barrels	
Copper nitrate	p	9	Isolate	Barrels, kegs	y
Ferric nitrate		9	Isolate	Barrels	y
Formic acid	c	3		Barrels carboys	w
Fulminates		2	Highly explosive		
Hydrochloric acid	c		Away from chlorates	Tank cars, glass	w
Hydrofluoric acid	c			Lead or paraffin	w
Lead nitrate	p	9	Isolate	Barrels	y
Magnesium, powder		4	Dry, avoid dust	Metal containers	y
Magnesium nitrate		9	Isolate	Boxes	y
Naphthalene		3	Cool, ventilated	Barrels	
Nickel nitrate	p	9		Kegs	y
Nitric acid	c	9	Away from Comb M	Glass containers	w
Nitroaniline	p	8	Dry	Kegs	
Nitrochlorobenzene	p	3	In the open	Kegs	
Phenol	p	3		Glass	
Phosphorus, red		1	Isolate	Tin cans	y
Phosphorus, white	p	5	In water	Tins (in water)	y
Phosphorous sulfide		5	Isolate	Drums, bottles	
Picric acid	c	9	Isolate	Wood or glass	
Potassium	c	6	In kerosene dry	Glass (in oil)	y
Potassium chlorate		9	Away from Comb M	Barrels, kegs	y
Potassium hydroxide	c		Dry	Barrels, glass	
Potassium nitrate		9	Dry	Tins, bottles	y
Potassium permanganate		9	Isolate	Tins, bottles	y
Potassium peroxide	c	8	Dry	Tins	y
Potassium persulfate		9	Dry	Glass or stoneware	y
Potassium sulfide		3		Drums, bottles	
Silver nitrate	c	9	Cool and dark	Brown glass bottles	y
Sodium	c	6	In kerosene	Metal or glass	y
Sodium chlorate		9	Away from Comb M	Barrels, bottles	y
Sodium hydroxide	c		Dry	Barrels, drums	y
Sodium nitrate		9	Dry	Tins, bottles	y
Sodium perchlorate	c	9	Isolate	Iron or glass	y
Sodium peroxide	c	8	Dry	Tins	y
Sodium sulfide		3		Drums, bottles,	y
Strontium nitrate		9	Isolate	Barrels, boxes	y
Sulfur		1	Ventilated	Box cars, barrels	
Sulfuric acid	c		Away from Ox and Comb M	Tank cars, drums	w
Thorium nitrate		9	Dry	Kegs	y
Uranium nitrate	p	9	Dry	Glass bottles	y
Zinc chlorate		9	Away from Comb M	Bottles, drums	y

* Interstate Commerce Commission (I C C) label r–red, w–white, y–yellow

Life Hazard c–corrosive or caustic, e–explosive, p–poisonous, s–suffocating vapors

Fire Hazard The numbers refer to the types of hazard, q v

Storage Comb M = combustible materials Ox M = oxidizing materials

mol when a substance passes into the crystalline state **h of decomposition** The number of calories liberated or absorbed during the complete decomposition of a mol of substance **h of dilution** The quantity of heat consumed or liberated when a liquid or solution is diluted **h of dissociation** The h involved in the disruption of certain bonds **h of dissolution** H of solution **h of evaporation.** H of vaporization The quantity of heat required to convert a definite amount of a liquid at its boiling point into the gaseous state, *e g* ,

H_2O (liquid) $\rightarrow$ H_2O(steam)—9720 calories

Such equations refer to moles, and hence must be divided by the molecular weight in order to find the number of calories per gram, *e g* , 9720/18 = 540 calories per gram water at 100°C Cf *latent heat* **h of explosion** The calories liberated from a mole of explosive **h of foods** See *h value* **h of formation** The quantity of heat liberated or consumed when a compound is formed from its component elements The quantity of h depends on the physical condition (solid, liquid or gaseous) of the reacting molecules, thus,

$2H_2$ (g) + O_2 (g) = $2H_2O$ (l) −136,000 calories
$2H_2$ (g) + O_2 (g) = $2H_2O$ (g) −118,000 calories

as well as on their crystalline forms
S (rhombic) = S (monoclinic) + 77 calories
h of fuels See *h value* **h of fusion** H of melting The quantity of heat required to convert a definite amount of a solid at its melting point into the liquid state as,

H_2O (ice) $\rightarrow$ H_2O (liquid)—1438 calories,

hence 1438/18 = 79 8 cal per gram of water at 0°C **h of hydration** The amount of heat consumed or liberated when a substance takes up water, *e g* ,

$CdCl_2$ + H_2O (l) $\rightarrow$ $CdCl_2$ H_2O—1320 cal
$CaCl_2$ + $6H_2O$ (l) $\rightarrow$ $CaCl_2$ $6H_2O$ + 21,750 cal

h of ionization The number of calories consumed or liberated when a gram-equivalent of a molecule ionizes **h of isomerization** The h involved in the formation of isomers **h of linkage** The amount of h required to form or disrupt certain atomic bonds **h of mixing** For solid and liquid, see *h of solution,* for liquid and liquid see *h of dilution,* for gas and liquid see *h of absorption* **h of neutralization** The number of calories liberated on neutralization, or $H^+ + OH^- \rightarrow H_2O$ + 13,700 calories (at 18°C) **h of oxidation** See *h of combustion* **h of racemization** The quantity of heat consumed or liberated during the change from one stereoisomer to the other **h of reaction** The quantity of heat consumed or liberated in a chemical reaction, as *h of combustion, h of neutralization, h of formation,* etc The condition of the reacting substance as well as of the reaction product is an important factor in the amount of heat produced or consumed, hence it is generally indicated in the equation by the abbreviations (s) for solid, (l) for liquid, (g) for gas **h regenerators** Stoves used in the blast furnace process for iron, which are heated up by waste hot gases, and then cooled by heating up cold gases for the blast (See *Cowper stoves*) **h shocking** A process similar to pasteurisation, in which a preliminary heat treatment is used to ensure that only the most virile and heat-resistant organisms in a culture are surviving The resulting culture has thus increased virility **h of solidification** The quantity of heat liberated on freezing or solidifying **h of solution** H of dissolution The quantity of heat liberated or consumed when a solid is dissolved in a liquid Cf *h of hydration* and *h of ionization* **h of sublimation** The number of calories required to convert a solid into a gas at constant temperature **h of swelling** The heat evolved when a colloid (*e g* , gelatin) is placed in water and absorbs the latter **h of transition** The quantity of heat liberated or consumed at the transition temperature, when a substance passes from one into another allotropic form **h of vaporization** See *h of evaporation* **h quantity** The amount of heat energy expressed in calories **h rays** See *infrared, radiation* **h summation** See *Hess law* **h units** Heat (H) may be expressed in dynamical units (ML^2T^2), in thermal units ($M\theta$) or thermometric units ($L^3\theta$), to the last two types belong respectively the practical units

heat quantity	calories,
heat intensity	degree centigrade

h value The number of calories obtained by the complete combustion of a substance *E g* , *Foods* The heat liberated on oxidation of 100 grams of food is

4 1C + 4 1P + 9 3F = calories per 100 gms

where C, P, and F are the number of grams or the percentage of carbohydrates, proteins and fats, respectively *Fuels* The heat obtained on the complete combustion of fuels is given approximately by

$8149C + 34{,}500H—3000(O–N)/100$ cals

where C, H, O and N are, respectively, the percentage of carbon, hydrogen oxygen and nitrogen in the fuel The A S M E formula for coals approximates to this heat value

$$\text{B t u per pound} = 14{,}600C + 62\,000\left(H - \frac{O}{8}\right) + 4000S$$

where C, H, O and N are the respective weights of carbon, hydrogen, oxygen and sulfur in one pound of fuel

heater A device by which the temperature of a body can be raised Cf *furnace* **direct-** An open fire or flame, *e g* , burners, lamps, ovens **indirect-** A water-bath, steam-bath, air-bath, oil-bath, etc or an electric heater

Heaviside layer See *Kennelly-Heaviside*

heavy - (1) Not light (2) Large in quantity **h acids** Those which are used in large quantities, as, sulfuric, hydrochloric and nitric acids **h chemicals** Those which were formerly manufactured in ton lots, as, sodium carbonate potassium cyanide, oxalic acid, etc **h hydrogen** Deuterium **h metal** A metal whose specific gravity is greater than four The heavy metals are all located in the lower half of the new periodic table, they have complex spectra, form colored salts and double-salts, have a low electrode potential, are mainly amphoteric, and yield weak bases and weak acids They have usually more than one valency forming more than one series of compounds, and therefore behaving as oxidizing or reducing agents *E g* ,

valence number	Fe 0 metallic iron	Fe^{++} 2 ferrous compounds	Fe^{+++} 3 ferric compounds	FeO_4^{--} 6 ferrates

OXIDATION →
← REDUCTION

h spar Barite **h water** See *water, deuterium*

hectare A unit of area in the metric system 1 hectare = 100 acres = 2 471 acres

hecto- A prefix indicating "hundred" In the metric system it indicates one hundred units

hectogram In the C G S system 1 hgm = 100 gm = 3 oz 230 7 grains (seldom used)

hectoliter In the C G S system 1 hl = 100 liters = 2 8378 bushels = 22 Imperial gallons = 26 4 U S gallons

hectometer. In the C G S system 1 hm = 0 1 km = 100 m = 328 ft 1 inch

Hector's base $C_{14}H_{12}N_4S$ An oxidation product of phenyl thiocarbamide

hedenbergite $CaO\ FeO\ 2SiO_2$ A silica mineral (q v) of the pyroxene group, q v

hedeoma The dried leaves and tops of *H pulegioides*, American pennyroyal, an annual herb of U S and Canada, used as stimulant, carminative and emmenagogue **h oil** The essential oil of *Hedeoma pulegioides* A colorless or yellowish liquid of pungent odor, used to drive off mosquitos and fleas

hedeomol $C_{10}H_{18}O$ = 154 2 The ketone of the oil from hedeoma A colorless liquid, b 217 Cf *pulegone*

hedera Ivy

hederagenin $C_{31}H_{50}O_4$ = 486 5 A glucoside from the seeds of *Hedera* species (ivy), a genus of araliaceous plants Cf *hederaglucoside*

hederaglucoside $C_{32}H_{54}O_{11}$ = 614 43 Helexin A glucoside from *Hedera helix*, ivy, a common Araliaceae White powder, m 233, soluble in alcohol

hederic acid $C_{15}H_{26}O_4$ = 270 2 A crystalline acid from the seeds of ivy, *Hedera helix*

hederine $C_{42}H_{66}O_{11}$ = 746 7 An organic principle from the seeds of ivy, *Hedera helix*

hedgehog crystals Crystals of ammonium urate found in urinary deposits

hedonal $C_6H_{13}O_2N$ = 131 1 Methyl-propyl-carbinol-urethane, pentan-2-ol-urethane NH_2-CO OCH(Me)Pr A white crystalline powder, m 74, b 215, soluble in 120 pts water, used as a hypnotic and diuretic Cf *aponal*

Heerwagen pipette A glass tube with outlet tube and piston for delivering small quantities of mercury

Hefner lamp A device for burning amyl acetate and regulating and measuring the height of the flame, which should be 4 cm high Used as a standard for photometric measurements in Germany **H unit** The horizontal illuminating intensity of the Hefner lamp burning at a pressure of 760 mm in an atmosphere containing 8 8 % of water vapor 1 Hefner unit corresponds with 0 9 candle power

Hehner Number A measure of the percentage of water-insoluble fatty acids and unsaponifiable matter in a fat or oil

Heidenhain thermometer A delicate thermometer ranging from −2 5°C to 5°C and graduated in 1/100°C , used in cryoscopes (q v) for molecular weight determination from the depression of the freezing point of solutions

Heim's cage A metal box with a wire screen and two compartments for breeding mice and other small rodents for experimental purposes

Heisenberg, Werner 1901– A German physical chemist **H principle** The uncertainty or indeterminism principle Within the atom it is meaningless to define both position and velocity of the electrons, because Δx, the error in specifying velocity x, multiplied by Δp, the error in specifying position p, is always of the order of magnitude of Planck's constant, h, *i e* ,

$$\Delta x \Delta p \sim h$$

Hence, assuming a definite velocity, only an approximate position is calculable, likewise, assuming a definite position, only an approximate velocity can be calculated Cf *wave mechanics* In simple language The limit to observational experiments is reached when the observational or determining factors begin to interfere with normal happenings in the experiment under observation

Heitler, Walter 1904– A German theoretical physicist **H and London bond** A pair of electrons in opposite spin Cf *bond*

helcosol Bismuth pyrogallate

helenene $C_{19}H_{26}$ = 254 2 A hydrocarbon obtained by distilling crude helenin with phosphoric acid

helenin (1) C_6H_8O = 96 1 Inula camphor True helenin Odorless, colorless crystals, m 72, b 150, from the roots of *Inula helenium* (2) $C_{21}H_{28}O_{31}$ = 776 3 Crude helenin A principle from the root of *Inula helenium* consisting of alantol, alant camphor and alantic anhydride (3) Inulin (4) $C_{20}H_{26}O_5$ = 345 3 A bitter, crystalline substance from the leaves of *Helenium autumnale*, sneezewort, a Compositae It differs from the true or crude helenin obtained from inula (5) Helenene

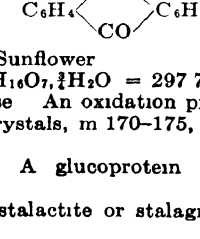
helenite Mineral caoutchouc

helexin Hederaglucoside

helianthic acid $C_{14}H_8O_8$ = 305 1 An acid from the seeds of *Helianthus annuus*, sunflower, a Compositae

helianthin Dimethyl amido azo benzene sulfonic acid $Me_2N—C_6H_4—N\ N—\ C_6H_4SO_3H$ A dye occurring in lustrous red crystals Its sodium salt is methyl-orange

helianthrone $C_{28}H_{14}O_2$ = 382 17 Benzodianthrone dibenzo (α,0) perilene-7 16-dione The homocyclic ketone



helianthus Sunflower

helicin $C_{13}H_{16}O_7,\frac{1}{2}H_2O$ = 297 71 Salicyl aldehyde glucose An oxidation product of salicin Colorless crystals, m 170–175, soluble in water or alcohol

helicoprotein A glucoprotein from the snail, *Helix*

helictite A stalactite or stalagmite of irregular shape

helide A supposed compound of helium, *e g* , mercury helide, $HgHe_{10}$

heliolamp An electric lamp containing a silicon-coated carbon filament, used for the production of artificial sunlight

heliotrope A variety of quartz with a greenish tint and red specks, used as a semiprecious stone

heliotropic acid Piperonylic acid

heliotropin (1) Piperonal (2) A purple diazo dye (3) The odorous principle of *Heliotropium* species, cf *piperonal*

heliotropine An alkaloid from *Heliotropium europaeum*, a Boraginaceae

helisterol $C_{26}H_{44}O_2$ = 388 4 A colorless sterol from plant carotenoids

helium He = 4 003 A chemically-inert gas and element, atomic number 2 It is a constituent of the atmosphere, of radioactive minerals and of natural gases Discovered in 1895 by Ramsay and Cleve, after its presence in the sun was indicated spectroscopically by Lockyer and Frankland in 1869 A colorless gas, $d_{(air=1)}$ 0 137, m −272, b −268 8 Used in America for filling balloons and airships, also for filling incandescent lamps It is transported in steel cylinders **h atom** The h atom is assumed to consist of a nucleus having two positive charges, around which two electrons move in orbits whose planes are inclined at 120° **h compounds** H has a valency of zero, hence it forms no ordinary compounds Excited He molecules however, give compounds, helides, q v **h nucleus** The atomic nucleus of He (mass nearly four times that of hydrogen) is assumed to be a constituent of all other elements (Harkin's theory), and is itself composed of hydrogen nuclei Cf *packing effect* In radioactive disintegration (q v) He nuclei (alpha rays) are thrown off at a high speed Their positive charge is neutralized by attracting two electrons, thus forming the He gas which is always associated with radioactive minerals Cf *petalon, piezoelectron, Hackh theory*

helix (1) The coil of wire in an electromagnet (2) A spiral arrangement of the periodic system, q v (3) A snail

hellebore A genus of ranunculaceous plants **American-** *Veratrum viride* **black-** The root of *Helleborus niger* **false-** American- **green-** The root of *H viride* **white-** *Veratrum album*

helleborein. $C_{87}H_{56}O_{18}$ = 788 6 or $C_{21}H_{34}O_{10}$ = 446 26 A glucoside from the roots and leaves of *Helleborus niger* and *H viridis* Soluble in water or alcohol Used as a local anesthetic and heart stimulant

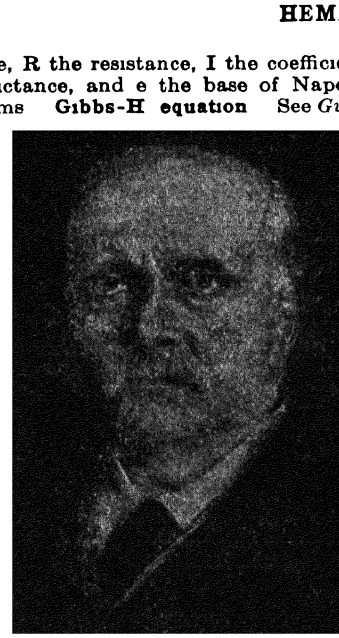
helleboresin $C_{30}H_{38}O_4$ = 462 29 A decomposition product of helleborin

helleboretin $C_{14}H_{20}O_3$ = 236 2 A deep violet decomposition product of helleborein

helleborin $C_{36}H_{42}O_6$ = 570 4 A crystalline glucoside from the roots of *Helleborus niger* Slightly soluble in water, soluble in ether or alcohol Used as a narcotic

Helmert's equation The acceleration due to gravity at sealevel is g = 978 038 (1 + 0 005302 $\sin^2$ H − 0 000007 $\sin^2$ 2I) where I is the latitude Subtract 0 000192 for each meter of height (H) from the value of g

Helmholtz, Herman Ludwig Ferdinand von (1821–1894) A German scientist noted for his generalizations on the conservation of force, physiological optics, electrodynamics, theories of electricity, and his discovery of nerve cells **H equation** of inductance $I = \frac{E}{R}\left(1 - e^{-\frac{R}{T}t}\right)$, where E is the electromotive force, R the resistance, I the coefficient of self-inductance, and e the base of Naperian logarithms **Gibbs-H equation** See *Gibbs*



von Helmholtz

helminth A worm or intestinal parasite

helminthic Anthelminthic

helmitol $C_7H_9O_7(CH_2)_6N_4$ = 344 26 Hexamethylenetetramine anhydromethylene citrate Colorless crystals, m 163, used as urinary antiseptic Cf *cystopurin*

Helmont, Johann Baptist van 1577–1644 A Belgian alchemist whose work represents the transition from speculative to experimental chemistry He originated the term "gas" (chaos)

helonias False unicorn root, starwort The root of *H dioica* (*Chamaelirium luteum*), a Liliaceae, used as tonic and diuretic

helonoid The combined principles from the root of *Chamaelirium luteum*, false unicorn, used medicinally as a tonic, diuretic, and vermifuge Cf *chamaelirin*

helthin KO $C_{10}H_6NH_2$ Potassium-aminonaphthol A reagent for nitrites in water

Helvella A family of cryptogams

helvellic acid $C_{12}H_{20}O_7$ = 276 2 A dibasic, poisonous acid from *Helvella esculenta*, which causes hemoglobinuria

helvetium An element, atomic number 85 Discovered in 1940, by Minder of Berne, in the decomposition products of actinium

helvite $(BeMoFe)_7Si_9O_{12}S$ A brittle, lustrous, yellowish to greenish colored mineral

hema- A prefix denoting blood See *haemo-*

hemachate Blood agate A yellow variety of agate

hemacyanin Hematocyanin A blue coloring matter found in bile, cf *hemocyanin*

hemacytometer Hemocytometer

hemaglobinometer Hemoglobinometer, q v

hemaglutination Hemoglutination

hemaglutinins Substances (agglutinins) which cause the clumping of red blood corpuscles

hemagog An agent that promotes the menstrual or hemorrhoidal discharge of blood

hemanthine An alkaloid of *Haemanthus toxicarus*, an Amaryllidaceae, constituent of Aus-

tralian arrow poisons, resembling scopolamine in its effect

hemase A catalase (q v) derived from blood

hematein $C_{16}H_{12}O_6$ = 300 1 An oxidation product of hematoxylin A brownish powder, insoluble in water, slightly soluble in alcohol, soluble in ether, used as indicator in alkalimetry

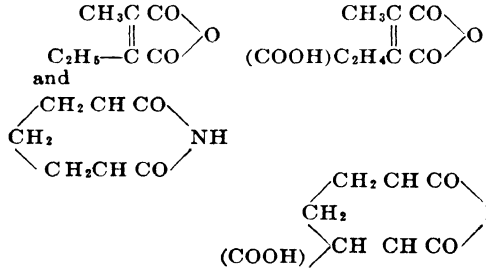
hematic acid Δ^3-1,3,4-pentene tricarboxylic acid A tribasic acid obtained from hematin, HOOC-$(CH_2)_2$C(COOH) C(OOH)Me

hematin $C_{34}H_{32}N_4O_6Fe$ = 648 5 Phenodin, haematin The prosthetic group of the hemoglobin of blood A brownish-black powder, soluble in alkalis **oxy-** $C_{34}H_{32}N_4O_7Fe$ = 664 5 The coloring matter of oxyhemoglobin It yields on strong oxidation hematinic acid, on strong reduction hematoporphyrin, and on heating pyrrole and pyrrole derivatives Cf *porphin*

hematine crystals Hematoxylin **h extract, h paste** Hematoxylin paste, more strictly applied to its oxidation product

hematinic An agent that increases the hematin content of blood

hematinic acids A group of di- and tribasic acids obtained by the strong oxidation of hematin, the anhydrides and imides have the formulae



Cf *hematic acid*

hematite, haematite Fe_2O_3 Red iron ore Raddle The most common iron ore used in metallurgy for the manufacture of iron and steel **brown-** The hydrated variety or limonite **red-** Kidney ore Rhombic or reniform native Fe_2O_3 **specular-** Specularite

hematocrit A small centrifuge, used to separate blood corpuscles in clinical analysis

hematocrystallin Oxy*hemoglobin*

hematocyanin Hemocyanin

hematoglobulin Oxy*hemoglobin*

hematoidin Bilirubin

hematology The science of the properties and diagnostic indications of blood

hematolysis Hemolysis

hematoporphyrin (1) $C_{16}H_{18}N_2O_3$ = 286 16 Porporino A decomposition-product of hematin, occurring with hemoporphyrin in urine, m below 100 (decomp) (2) $C_{34}H_{38}N_4O_6$ Cruentine A dark violet powder obtained by adding hemin to glacial acetic acid saturated with HBr, and neutralizing after some time with NaOH It is insoluble in water, soluble in alcohol Cf *porphin*

hematoxylic acid Hematoxylin

hematoxylin $C_{16}H_{14}O_6 3H_2O$ = 356 2 Haematoxylic acid, haematine, hematine crystals, logwood crystals, campeachy wood, Jamaica wood, steam black The coloring principle of *Haematoxylon campechianum* (logwood) Colorless or slightly yellow crystals, soluble in water, alcohol, or glycerin, slightly soluble in ether or carbon disulfide Soluble in alkalis (ammonia, borax, etc) producing a purple color, with acids the color changes to yellow On exposure it turns black with the formation of hematoxylin Used as a mordant dye, as an indicator in the titration of alkaloids, as a stain in microscopy, and as reagent for copper and iron **h paste** Logwood paste, hematin extract, logwood extract A technical grade of hematoxylin used as coloring material in the textile and leather industries

hematoxylon Haematoxylon

heme compounds Derivatives of hemoglobin and chlorophyll, as, porphyrins and hemins For their structure, see *porphin*

hemellitic acid *2 3*-xylic acid

hemellitol Hemimellitene

hemerythrin A relatively rare iron-protein compound in living tissues

hemi- A prefix derived from Greek meaning "half " See also "*semi-*" (Latin) and "*demi-*" (French)

hemialbumose Propeptone A decomposition product of albumin, related to peptone

hemicellulose (1) A constituent of the cell wall of bacteria (2) Pseudocellulose A group of gummy substances intermediate in composition between cellulose and the sugars (3) A constituent of starch Cf *xylan*

hemicolloid A colloidal particle having a chain length up to 250 Å U and a polymerization of 20 to 100 molecules Cf *mesocolloid*

hemihedral Describing a crystal which has only half the number of faces that the symmetry of the system requires, Cf *holohedral*

hemimellitene C_9H_{12} = 120 1 Hemimellitol, 1 2 3-trimethylbenzene, $C_6H_3Me_3$ A colorless liquid, b 175

hemimellitic acid $C_9H_6O_6$ = 210 05 Benzene-1 2 3-tricarboxylic acid, v-tricarboxybenzene, $C_6H_3(COOH)_3$ Colorless needles, m 196 (decomp), slightly soluble in water, soluble in alcohol or ether Cf *hemellitic acid*

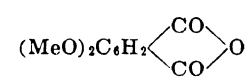
hemimellitol (1) HO $C_6H_2Me_3$ (2) Hemimellitene

hemimorphite Calamine (British usage)

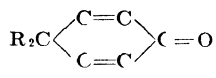
hemin $C_{34}H_{32}O_4N_4FeCl$ = 658 0 Teichmann's crystals, hematin chloride The characteristic microcrystals obtained by heating a crystal of sodium chloride, a drop of glacial acetic acid, and blood on a microscope slide It is an identification test for blood of different species (see figure)

hemipic acid Hemipinic acid **h anhydride.** Hemipinic anhydride

hemipinic acid $C_{10}H_{10}O_6$ = 226 1 Hemipic acid Dimethoxybenzene-dicarboxylic acid, 3 4-dimethoxyphthalic acid, $C_6H_2(OMe)_2(COOH)_2$ Colorless crystals, slightly soluble in water, soluble in alcohol It is a split-product of nicotine, and occurs in the following isomeric forms, where the first two numbers indicate the position of the methoxy groups, the last two numbers the carboxyl groups **3 4 1 2-** m 185, (decomp) **4 5 1 2-** m 178 **5 6 1 2-** m 180 **h anhydride** $C_{10}H_8O_5$ = 208 1 3 4-dimethoxyphthalic anhydride

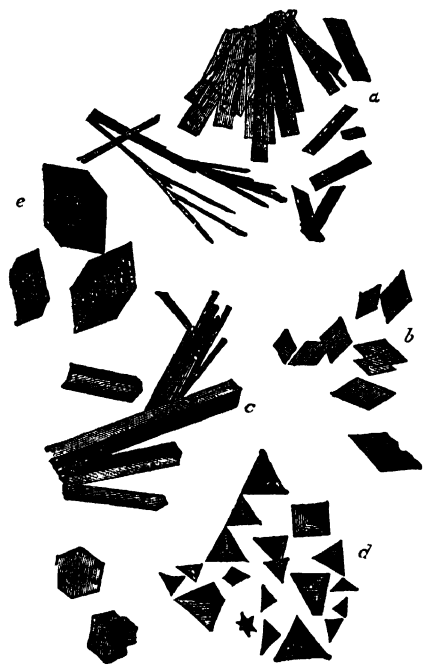


hemiquinoid The structural arrangement



Cf *quinoid*

hemisotonic Having an osmotic pressure equal to that of blood Cf *isotonic*



Hemin crystals,
from the blood of man (a, b) cat (c), guinea pig (d) marmot (e), and squirrel (f) (Gautier)

hemit A trade name for molded tar and asbestos products used for electrical insulation

hemiterpenes A group of hydrocarbons of the general formula C_5H_8, related to the terpenes (q v), as, isoprene

hemlock (1) The fir tree *Tsuga canadensis* of Western and Northern America (2) The poisonous plants and shrubs of the *Conium* species, Umbelliferae **poison-, spotted-** Conium **water-** Cicuta **h alkaloids** Alkaloids from the seeds and bark of *Conium* species conine, conhydrine, coniceine **h bark** The bark of the hemlock fir, used in tanning **h fir** The tree *Tsuga canadensis* of W and N America **h spruce** H fir **h tannin** $C_{20}H_{16}O_{10}$ (?) A tannin from the bark of *Tsuga* species

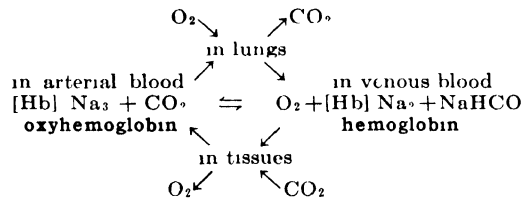
hemocuprein A blue copper-protein compound in the red blood corpuscles and livers of mammals

hemocyanin Haemocyanin A blue coloring matter from the blood of mollusks It is related to hematin, but contains copper instead of iron *Cf hemacyanin, chromoprotein*

hemocytometer Hemacytometer, hemameter, etc A microscope slide with square rulings, used for counting the number of blood corpuscles in a preparation

hemodyn See *periston*

hemoglobin Haemoglobin Hb A chromoprotein and coloring matter of red blood corpuscles of mammals Brownish-red powder, soluble in water It consists of hematin combined with the histon, *globin*, is the oxygen carrier of the blood of mammals and is related chemically to chlorophyll Molecular weight, 68,000 ± 1000 **kat-** A compound of denatured globin and hematoxylin, produced by the action of chloroform on methemoglobin **met-** An oxidation product of h formed when blood is left standing It contains trivalent iron **oxy-** The hemoglobin of arterial blood, containing divalent iron **reduced-** The hemoglobin of venous blood Its reactions and changes in the blood stream are



Cf *cytochromes, respiration, porphin, hemocyanin*

hemoglobinometer An instrument for determining the amount of hemoglobin in the blood

hemoglutination The clumping together or agglutination of the red blood corpuscles

hemolysin A substance that causes hemolysis, such as saponin venoms, or the proteins formed in the body by the introduction of red blood corpuscles from another species which are capable of dissolving the red blood corpuscles of the host species **h-** H made from *Helix pomatia* **l-** H made from *Limulus polyphemus* **o-** H from *Octopus vulgaris*, molecular weight, 2,050,000

hemolysis Hematolysis (1) In the living organism The abnormal loss of hemoglobin of the blood corpuscles, causing the blood to become brighter and clearer, it finally results in death (2) The dissolving of red blood corpuscles by chemicals heating freezing or biological agents, which causes the blood to become transparent and clear Used in certain diagnostic reactions to determine the presence or absence of antibodies See *Wassermann reaction, Ehrlich side-chain theory, heterolysis*

hemolytic An agent that causes the destruction of red blood corpuscles

hemolyzate The product of hemolysis

hemoporphyrin $C_{16}H_{18}O_3N$ = 272 2 A decomposition product of hematin, closely allied to the phylloporphyrin, decomposition product of chlorophyll, both split to hemopyrrole Cf *porphin*

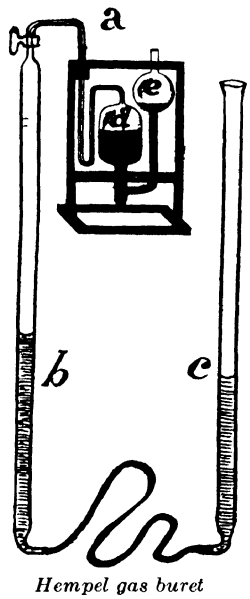
hemopyrrole $C_8H_{13}N$ = 123 2 A pyrrole derivative and decomposition-product of both, hemoglobin (hemoporphyrin) and chlorophyll (phylloporphyrin)

hemostatic An agent which when applied externally checks the flow of blood as tannin, Monsel's solution ferric chloride Cf *styptic*

hemp The plant *Cannabis indica* or *C sativa*, an Urticaceae, of which (a) the flowering tops are the drug cannabis and yield a resin (cannabin, (b) the leaves and stalks are hashish, (c) the seeds yield h seed oil, and (d) the

stems a fiber used for ropes or paper **bowstring-** A tough fiber from *Sansevera Zeylanica*, a Liliaceae of Ceylon **Bombay-** Sunn- **Canadian-** *Apocynum cannabinum* The roots are used medicinally **China-** See China *jute* **Deccan-** The fiber from *Hibiscus cannabinus*, a Malvaceae of India **Manila-** Abaca **Mauritius-** The fiber *Furcraea gigantea*, an Amaryllidaceae **New Zealand-** N Z flax The fiber from *Phormium tenax* **sisal-** See *sisal* **sunn-** Bombay h A fiber obtained from the stems of *Crotalaria juncea*, a Leguminosae of India and Australia

h seed The seeds of Cannabis species **h seed oil** A light-green, non-drying oil, expressed from hemp seeds Its chief constituent is linolein, d_{15} 0 925–0 932 m −15 to 23 Used for soap, paints and varnishes



Hempel gas buret

Hempel, Walther 1851–1916 A German analytical chemist **H gas buret** A glass apparatus used frequently in gas analysis for the absorption of gases by solid or liquid reagents The gas is measured in the buret b and on raising the leveling tube c it enters the absorption bulb d (of which there may be one or more), through the capillary tube a," and pushes the absorbing liquid partly into the levelling bulbs, e the whole being mounted compactly upon a metal frame After absorption the residual gas is pulled back into the buret and measured **H palladium tube** A U-shaped glass tube filled with palladium sponge for use in gas analysis to absorb hydrogen

henbane Hyoscyamus

hendecanal* $C_{11}H_{22}O$ = 170 17 Undecylic aldehyde, undecanal*, $Me(CH_2)_9CHO$ A colorless liquid d 0 825, m −4, b 117

hendecane* Undecane **h carboxylic acid** Lauric acid **h dicarboxylic acid** Brassylic acid

hendecanoic* Undecylic

hendecanol Hendecyl alcohol

hendecanone* $C_{11}H_{22}O$ = 170 17 Undecanone **1-** Hendecanal **2-** Methyl-*n*-nonyl-ketone, $MeCOC_9H_{17}$ A colorless liquid, d 0 826, m 12l 1, b 228, in oils of rue and lime **6-** Diamyl ketone amyl ketone, $C_5H_{11}COC_5H_{11}$ A colorless liquid, d 0 826, m 14 6, b 226 3

hendecene* $C_{11}H_{22}$ = 154 17 Undecylene, undecene* A group of unsaturated hydrocarbons, **as, α-** or **1-** CH_2 $CH(CH_2)_8Me$ A colorless liquid, d 0 763, b 188 **β-** or **2-** MeCH $CH(CH_2)_7Me$ A liquid, d 0 774, b 193, both are insoluble in water, soluble in alcohol or ether

hendecoic acid Undecylic acid

hendecyl Undecyl The monovalent radical, $Me(CH_2)_{10}$— or $C_{11}H_{23}$— **h alcohol** $C_{11}H_{24}O$ = 172 19 **1-** 1-hendecanol*, *n*-undecyl alcohol, undecan-1-ol A colorless liquid, d 0 883, m 19, b_{30mm} 146 **6-** 6-hendecanol*, n-undecan-6-ol A colorless liquid, d 0 833, m 16 b 235 **h amine*** $C_{11}H_{25}N$ = 171 20 *n*-undecylamine, 1-amino-undecane A colorless liquid, m 16 5 b 234

Henderson, George Gerald 1862–1942 A British chemist, noted for his work on terpene chemistry **H process** Roasting copper ores with salt, subsequent leaching of the chlorides, and precipitation of the metals

heneicosane $C_{21}H_{44}$ = 296 4 A saturated hydrocarbon, m 40 5, of the methane series **h dicarboxylic acid** $C_{23}H_{44}O_4$ = 384 3 Colorless crystals, m 124, in Japan wax (3 %)

heneicosanic acid $C_{21}H_{42}O_2$ = 326 3 White needles m 74, in fats

henequen The fiber of *Agave fourcroydes*, a Mexican plant and the West Indies, used for ropes Cf *sisal*

henna The powdered leaves of *Lawsonia inermis* A Lythraceae of Asia Minor Egypt and Persia Used as a brown dye especially for hair

Henry, Joseph 1797–1878 An American physicist noted for his research in magnetism Cf *henry* **H, William** 1775–1836 An English chemist and co-worker of Dalton **H's law** The amount of gas dissolved in a liquid is proportional to the pressure of the gas, hence, the ratio of the concentrations of the gas in gaseous and soluble form is a constant, provided the temperature is constant

henry H The unit of induction If the e m f induced is 1 volt and the inducing current varies at the rate of 1 amp per second, a henry, or quadrant, or secohm is = 10^9 e m u or $\frac{1}{9} \times 10^{-11}$ e s u
1 international henry = 1 00052 absolute henry
1 absolute henry = 0 99948 international henry
= 1 1124 × 10^{-12} c g s e s u = 10^9 c g s e m u
= 1 practical henry

hentriacontane* $C_{31}H_{64}$ = 436 6 A hydrocarbon of the methane series m 69 obtained from the roots of *Oenanthe crocata*, an Umbelliferae also found in beeswax

hepar The Greek term for "liver" **h antimoni** Sodium or potassium antimoniate **h calcis** Calcium sulfide **h reaction** A test for sulfur The compound is reduced with soda and carbon, and the mass moistened on a silver coin A black stain indicates sulfur **h siccum** The powdered dried liver of animals used as food in diabetes **h sulfuris** Liver of *sulfur*

heparin A blood anti-coagulant of the liver a conjugated glucuronic acid glucoside

hepatic gas Hydrogen sulfide

hepatica The dried plant *Hepatica triloba*, liverwort Used as a mild mucilaginous astringent

hepatin Glycogen

hepatocuprein A blue compound containing copper, in mammalian red blood corpuscles and liver

hepatoflavin Vitamin B_2

hepotic acid Oenanthic acid

heptacosane* $C_{27}H_{56}$ = 380 5 A hydrocarbon of the methane series, m 59, found in beeswax

heptad An element or radical having a valency of seven

heptadecane* $C_{17}H_{36}$ = 240 3 Dioctyl-methane A hydrocarbon of the methane series **h carboxylic acid*** Stearic acid **h nitrile*** Margaronitrile

heptadecanoic acid* Margaric acid
heptadecanone* Pelargone
heptadecoic acid Margaric acid
heptadecylic acid Margaric acid
heptadiene* C_7H_{12} = 96 09 **2 4-** MeCH - CH CH CH CH_2Me Colorless liquid, b 107 **h one** Phorone
heptaldehyde Heptyl aldehyde
heptamethylene Suberane
heptanal* Heptyl aldehyde
heptane* C_7H_{16} = 100 2 (a) Normal, heptane, methyl hexane, dipropylmethane hexylmethane, heptyl hydride, dimethylpentane $Me(CH_2)_5Me$ A colorless liquid, d 0 690, b 95, insoluble in water, soluble in alcohol or ether, highly inflammable Used as a solvent and an anesthetic, and occurs in the needles of *Pinus sabiana* (b) Dimethylisopentane, $(CH_3)_2CH(CH_2)_3CH_3$ A colorless liquid, d - 0 680, b 90, soluble in alcohol or ether (c) Triethylmethane $(C_2H_5)_3CH$ A colorless liquid, d 689, b 96, soluble in alcohol or ether (d) Diethyldimethylmethane $(C_2H_5)_2C(CH_3)_2$ A colorless liquid, d 0 711, b 86 insoluble in water, soluble in alcohol or ether **bicyclo-** See *carane, fenchane* **heptahydroxy-** Volemitol
heptane-1,7-dicarboxylic acid Azelaic acid
heptanedioic acid* Pimelic acid
heptanoic acid* Heptoic acid
heptanol* Heptyl alcohol
heptanone* **4-** Butyrone **3-** Ethylbutylketone **2-** Methylamyl ketone
heptatomic (1) Heptavalent (2) A molecule consisting of seven atoms
heptavalent (1) A molecule containing seven replaceable hydrogen atoms or seven hydroxyl groups (2) Septavalent An atom which has seven valence electrons, as, Mn or Cl
heptene* C_7H_{14} = 98 2 Heptylene, pentylethylene, CH_2 $CH(CH_2)_4Me$ A colorless liquid, d 0 703, b 98, soluble in alcohol or ether
heptenyl The monovalent C_7H_{13}- radical derived from heptene **h methyl carbonate** Heptine methyl carbonate
heptenylene Heptine
heptine C_7H_{12} = 96 1 Heptenylene, heptyne*, oenanthine, pentyl-acetylene The unsaturated hydrocarbon, HC $C(CH_2)_4Me$ A colorless liquid d 0 831, b 104 soluble in alcohol or ether **h methyl carbonate** $C_9H_{14}O_2$ = 154 11 Heptenyl methyl carbonate An ester, Me $(CH_2)_4C$ C COOMe, from the ricinoleic acid of castor oil, d 0 930 insoluble in water, used in perfumery
heptitol A group of pentatomic alcohols derived from heptoses
heptoic acid $C_7H_{14}O_2$ = 130 2 n-heptylic acid, amylacetic acid, oenanthic acid oenanthylic acid, heptanoic acid*, enanthic acid, $Me(CH_2)_5COOH$ A colorless oily liquid with an unpleasant odor, d 0 9345 m −10 b 223, insoluble in water, soluble in alcohol, ether or chloroform Used in organic synthesis **iso-** $Me_2CH(CH_2)_3COOH$ iso-heptylic acid, isooenanthic acid Colorless liquid, b 210, soluble in alcohol **h alcohol** Heptyl alcohol **h aldehyde** Heptyl aldehyde
heptose A sugar having seven carbon atoms See *carbohydrates*
hepturonic acid Any pentahydroxy aldehyde acid derived from heptoses, of the general formula CHO $(CHOH)_5COOH$ Cf *uronic acids*
heptyl The monovalent radical C_7H_{15}— or $Me(CH_2)_6$— derived from heptane **h acetate** $C_9H_{18}O_2$ = 158 2 The ester $AcOC_7H_{15}$ A colorless odorous liquid, d 0 874, b 190, insoluble in water, soluble in alcohol, used in artificial flavoring extracts **h alcohol** $C_7H_{16}O$ = 116 2 (1) $C_7H_{15}OH$ Oenanthol heptylic alcohol, *1*-heptanol*, normal hexyl carbinol A colorless, odorous liquid d 0 830, m −36, b - 176, soluble in water, alcohol or ether Used in organic synthesis (2) $Me(CH_2)_2CHOH-(CH_2)_2Me$ Iso-hexyl carbinol, dipropylcarbinol, *4*-heptanol* A colorless liquid, d - 0 814, m −41 5, b 149 soluble in alcohol or ether (3) Me_2CH $CHOH$ CH Me_2 Diisopropylcarbinol, *1 5*-dimethyl-*3*-pentanol* A colorless liquid, d 0 832, b 131, slightly soluble in water, soluble in alcohol or ether (4) Et_3COH Triethylcarbinol, *1 1*-diethyl-1-propanol* A colorless liquid, d 0 860, b 140 slightly soluble in water, soluble in alcohol or ether (5) Me_2COH CH_2 $CHMe_2$ Dimethylisobutylcarbinol, *2 5*-dimethyl-*2*-pentanol* A colorless liquid, b 130, soluble in alcohol or ether (6) Me_3C $COHMe_2$ Pentamethylethanol, *2 3 3*-trimethyl-2-butanol* A colorless liquid, b 132, soluble in alcohol or ether **h aldehyde** $C_7H_{14}O$ = 114 1 Oenanthal, enanthaldehyde*, oenanthylic aldehyde, heptoic aldehyde, normal heptylic aldehyde, heptanal $Me(CH_2)_5CHO$ An aldehyde obtained from castor oil A colorless, refractive, fragrant liquid, d 0 850, m −45, b 155, slightly soluble in water, soluble in alcohol, ether or chloroform Used in organic synthesis **h amine*** $C_7H_{17}N$ = 115 2 1-Aminoheptane $Me(CH_2)_6NH_2$ A colorless liquid, d 0 78 b 155, slightly soluble in water, soluble in alcohol or ether **h ether** $(C_7H_{15})_2O$ = 214 3 Heptylic ether, enanthylic ether, cognac oil, heptyloxyheptane* A colorless liquid, d 0 815, b 265, insoluble in water, soluble in alcohol or ether **h ethyl ether** $C_9H_{20}O$ = 144 2 Oenanthic ether oenanthylic ether, cognac oil, heptylethyloxide ethoxyheptane* $Me(CH_2)_6OEt$ A colorless, fragrant, oily liquid, d 0 840 b 166, insoluble in water, soluble in alcohol or ether Used in flavoring extracts and in organic synthesis **h formate** $C_8H_{16}O_2$ = 114 2 The formic acid ester $HCOOC_7H_{15}$ A colorless, aromatic liquid d 0 894, b 176, insoluble in water, soluble in alcohol or ether Used in organic synthesis **h resorcinol** Dihydranol
heptylene Heptene
heptylic acid Heptoic acid
heptyne* Heptine
Heraeus hot plate An electrically-heated plate or table used to replace gas burners
herapathite $4Qu\ 3H_2SO_4\ 2HI\ 4\ 6H_2O$ Artificial tourmaline Quinine sulfate periodide It is produced as optically-active crystals when iodine vapor is passed into a solution of quinine sulfate, used for polaroids, q v
herb A drug that consists of the leafy, flowering or fruiting stems of the smaller plants Many are used in the form of teas (infusions), others in the manufacture of essential oils The following are official (U S P)

Absinthium	Grindelia
Cetraria	Hedeoma
Chelidonium	Indian cannabis
Chimata	Lobelia
Eupatorium	Marrubium

Melissa	Scutellaria
Peppermint	Spearmint
Pulsatilla	Tansy
Scoparius	

bitter- Snakehead The leaves of *Chelone glabra*, a Scrophulaceae, used as anthelminthic Cf *chelonin* **blanket-** Mullein **felon-** Mugwort **Fuller's-** Saponaria

Hercules stone Magnetite

hercynite $FeAl_2O_4$ Iron spinel A fine granular black mineral d 3 92, hardness 7 5–8

herderite $Be(OH,F)CaPO_4$ A beryllium calcium phosphate mineral, d 3 0 hardness 5

heretine An alkaloid from *Heritiera javanica*, a Sterculiaceae of the Dutch Indies

hermetic Air-tight **h art** Magic or alchemy **h casing** A water-tight casing

Hermite process The manufacture of hypochlorite liquor for bleaching by the electrolysis of a solution containing 0 5 % NaCl and 0 05 % $MgCl_2$

herniarin $C_{10}H_8O_3$ = 176 1 Methylumbelliferone, 7-methoxycoumarin A ketone from *Herniaria glabra*, a Caryophyllaceae Cf *resocyanin*

heroine $C_{21}H_{23}O_5N$ = 369 2 Diacetylmorphine A white odorless powder, m 170, slightly soluble in water soluble in alcohol chloroform or ether It is a very toxic narcotic and considered to be the most habit-forming drug, its manufacture in the United States is prohibited **h hydrochloride** $C_{21}H_{23}O_5N.HCl$ = 405 7 Diacetylmorphine hydrochloride A more soluble form of heroine is used in hypodermic tablets

herpatite Herapathite

herrerite $(Zn,Cu)CO_3$ A cupriferous smithsonite

Hertz, Heinrich Rudolf 1857–1894 A German physicist noted for his research in theoretical physics

hertzian waves A group of electromagnetic oscillations, resembling light waves but much longer (0 2 cm to 1000 meters) Cf *radiations, diffraction*

herudin (1) A constituent of leeches which prevents the coagulation of blood (2) A preparation made from leeches

Herzberg's stain (1) A solution of I KI and $ZnCl_2$ in water, used to stain rag fibers *red*, chemically treated paper pulp *blue*, and mechanical woodpulp or lignin *yellow* (2) A solution of potassium iodide in sulfuric acid

hesperetic acid Hesperitinic acid

hesperetin $C_{16}H_{14}O_6$ = 302 2 A split-product of hesperidin Yellow crystals, decomp 220, soluble in alcohol or ether It is a chalcone of phloroglucinol

hesperetol $C_9H_{10}O_2$ = 150 08 5-Vinylguaiacol, 3-hydroxy-4-methoxystyrene, $CH_2:CH.C_6H_4(OMe)OH$ Colorless crystals, m 57

hesperidene d-Limonene

hesperidin $C_{28}H_{26}O_{12}$ = 482 2 Citrin vitamin P A glucoside from the unripe fruits of *Citrus aurantium* A yellowish powder, or small needles, decomp 251, slightly soluble in water or alcohol, insoluble in ether It splits on hydrolysis to hesperitinic acid, glucose and phloroglucinol Cf *naringin*

hesperidine An alkaloid from the leaves of *Peucedanum galbanum*, wild celery (Umbelliferae)

hesperitinic acid $C_{10}H_{11}O_4$ = 195 1 Isoferulic acid, m-oxy-p-methoxy cinnamic acid, 4-oxy-3-methoxy-cinnamic acid Yellow needles, m 228

Hess, Germain Henri (1802–1850) A German-born Russian chemist, and a founder (1840) of thermochemistry **H, Victor Franz** 1883– A German physicist and Nobel prize winner (1936), noted for pioneer work in cosmic radiations **H's law** The law of constants heat summation The amount of heat liberated or absorbed in a chemical reaction remains the same whether the reaction is performed in one or successive steps, hence the heat change of a chemical reaction is independent of its course and depends on the initial and final states of the substances involved **H photometer** Hess-Ives tint photometer A colorimeter for matching the colors of solutions with a number of colored glasses **H rays** Ultra-γ-rays Cosmic rays **H viscosimeter** A graduated capillary tube with a rubber bulb used for determining the viscosity of blood and other biological or colloidal solutions

hessian Cuttings from jute cloth used for paper manufacture, cf *botany* **h crucible** (1) A sand crucible (2) A large clay crucible

hessite Ag Te Silver telluride A black mineral, d 8 3–9, hardness 2 5–3

hessonite $Al(Ca,Fe)_2Si_3O_{12}$ Cinnamon stone A variety of garnet d 3 5, hardness 6 5–7

hetero- A prefix derived from Greek indicating unlikeness or difference

hetero-albumose A form of albumose, insoluble in water soluble in salt solutions and precipitated by saturation with sodium chloride

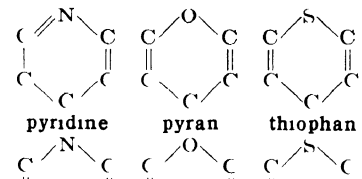
hetero-artose A protein, $C_{74}H_{130}N_{20}O_{24}S$

hetero-atom A heterocyclic atom

heterobaric Possessing different atomic weights as isotopes and heterotopes

heterocycle A ring consisting of different types of atoms Antonym homocycle Cf *heterocyclic compound*

heterocyclic Pertaining to dissimilar atoms in a ring **h atom** Any atom, other than carbon, that is a member of an atomic ring the more common atoms are N, O S Se P, As and others **h compound** A ring compound containing in its nucleus, besides carbon atoms, one or more other types of atoms Antonym, homocyclic The more important heterocycles are



See also *ring compounds*

heterogeneity The condition or state of being composed of particles or aggregates of different substances, hence, matter which is of dissimilar composition or has different properties along any dissecting line or plane Antonym, homogeneity

heterogeneous Heterogeneous Opposed to homogeneous (q v) Describes a substance which consists of more than one phase, and therefore is not uniform, as, granite, colloids,

suspensions, emulsions It has different properties in different parts **h reaction** A reaction in which two or more reactions take place simultaneously

heteroion An adsorption complex ion whose charge is due to an adsorbed simple ion, *e g*, a protein complex with adsorbed OH^-

heterolysis (1) The dissolution of a cell by an external agent, as opposed to autolysis (2) The hemolytic action of the blood serum of one animal species on the blood-corpuscles of another species

heterolyzate The filtered liquid portion of the products of heterolysis

heterophase Forming two or more states of aggregation Cf *phase*

heteropolar An unequal distribution of electric charges in a bond (q v), so that one atom is more positive or negative than the other Cf *homopolar*

heteropolyacids The complex acids of heavy metals with phosphoric acids, as, phosphomolybdic a phosphotungstic a

heterosugars *h*-sugars The structural isomers of the α- and β-mutarotation forms of a sugar, *e g*, the γ-sugars

heterotopes Elements which have different atomic numbers and therefore, occur in different parts of the periodic table Antonym Isotopes **heterobaric-** H having different atomic weights **isobaric-** H having the same atomic weight Cf *isobars*

heterotypes A compound which differs in its properties from compounds of a similar type

hetoform Bismuth cinnamate

hetol Sodium cinnamate

hetralin $C_6H_{12}N_6\,C_6H_6O_2$ = 278 20 Dioxybenzolhexamethylenetetramine Colorless needles decomp 155 soluble in water Used as a substitute for hexamethylenetetramine

heulandite A zeolite, $CaAl_2Si_6O_{16}$

Heusler alloys A group of strongly ferromagnetic alloys containing no iron but a mixture of manganese, copper, and aluminum They do not show the Kerr-effect

hevea See *rubber*

Hevesy, George von 1885– A German chemist, and codiscoverer of hafnium

hex Hexamethylenetetramine

hexa- A prefix derived from Greek, denoting "six"

hexa-atomic (1) Hexavalent (2) A molecule consisting of six atoms

hexabasic An acid or compound in which six hydrogens can be replaced by basic radicals

hexabiose Hexobiose

hexaborane B_6H_{10} = 71 31 A boron hydride, q v

hexabromide number An analytical value of fats, indicating their content of acids with three (or more) double bonds, is the number of mg Br needed to brominate 100 gm fat

hexabromo- A prefix indicating the presence of six bromine atoms **h ethane** C_2Br_6 = 403 8 Yellowish rhombic needles, decomp 210, slightly soluble in water or alcohol **h silico ethane** Silicon tribromide

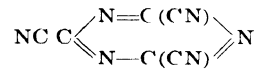
hexachloro- A prefix indicating the presence of six chlorine atoms **h benzene** C_6Cl_6 = 284 7 Colorless rhombic needles, d 2 044, m 229, b 326, insoluble in water or alcohol Used in organic synthesis, in airfield flares and in waterproofing dopes **h ethane** C_2C_6 = 236 8 Carbontrichloride, hexoram White rhombic crystals, d 2 011, m 184, insoluble in water, soluble in alcohol or ether Used in organic synthesis in the manufacture of explosives and fireworks, smoke-screens and disinfectants Cf *H C*

hexacontane $C_{60}H_{122}$ = 843 3 A saturated hydrocarbon of the methane series Colorless crystals, m 102

hexacosane $C_{26}H_{54}$ = 366 42 A saturated hydrocarbon of the methane series Colorless crystals, m 57, b $_{40mm}$296

hexacosanic acid $C_{26}H_{52}O$ = 396 4 White solid m 83, which occurs in peanut oil and in the wax from tubercle bacilli

hexacyan C_6N_6 = 180 5 A polymer of cyan having the structure



hexad (1) An element or radical having a valency of six (2) In crystallography showing six similar faces on rotation of the crystal around its axis of symmetry

hexadecane $C_{16}H_{34}$ = 226 3 Dioctyl, cetane A saturated hydrocarbon of the methane series White leaflets d 0 775, m 18, b 287, insoluble in water, soluble in alcohol or ether

hexadecanoic acid* Palmitic acid *11*-**hydroxy-*** Jalapinolic acid *16*-**hydroxy-*** Juniperic acid

hexadecanol* Cetyl alcohol

hexadecene Cetene

hexadecenoic acid* Zoomaric acid

hexadecine $C_{16}H_{30}$ = 222 2 Hexadecyne* An isomer of cetenylene, m — 25, b 280

hexadecoic acid Palmitic acid

hexadecyl Cetyl The monovalent radical $-C_{16}H_{33}$ derived from hexadecane **h alcohol** Cetyl alcohol **h amine** Cetylamine

hexadecylene Cetene

hexadiene* C_6H_{10} = 82 1 An unsaturated hydrocarbon with two double bonds **1 4-** $CH_2{:}CH\,CH_2\,CH{:}CHMe$ **1 5-** Diallyl **2 4-** $(MeCH{:}CH{-})_2$ Bipropenyl dipropylene A colorless liquid d 0 7108 b 82 *2 5*-**dimethyl-** $(Me_2C{:}CH{-})_2$ = 101 11 Diisocrotyl A colorless liquid, d 0 7158, m −91, b 102 5

hexadienedioic acid*, *2 4-* Muconic acid

hexadienic acid Sorbic acid

hexadienoic acid*, *2 4-* Sorbic acid

hexadiine Bipropargyl

hexadiyne* Bipropargyl

hexaethylbenzene $C_{18}H_{30}$ = 246 3 C_6Et_6 Colorless monoclinic crystals d 0 831, m 129, b 298, insoluble in water, soluble in alcohol or ether

hexafluorodisilane Disilane

hexagalloyl mannite $C_{48}H_{38}O_{30}$ = 1094 45 A tannin occurring as a brown powder, soluble in water

hexagon A plane figure bounded by six sides and having six angles **h tester** An electrically-heated device for determining the flash- and fire-points of oils

hexagonal crystal system A crystal system made up of four axes, 3 equal and intersecting in one plane at 60°, and one of a different length in a plane at right angles

hexahydrate Containing six molecules of water

hexahydric Containing six atoms of replaceable hydrogen

hexahydro- A prefix indicating that a compound contains six more hydrogen atoms than are

normally present **h anthracene** $C_{14}H_{16}$ = 184 2 White leaflets, m 63, b 290, insoluble in water, soluble in alcohol ether or benzene **h anthraquinone** Rufigallol **h benzene** C_6H_{12} = 84 1 Cyclohexane hexamethylene Saturated benzene A hydrocarbon occurring in Austrian and Caucasian petroleum A colorless liquid b 79, d 0 76 insoluble in water **h benzodipyrazolone** Dipyrazolone **h benzoic acid** Naphthenic acid **h cumene** C_9H_{18} = 126 2 Trimethylcyclohexane A colorless liquid d 0 787, b 139, insoluble in water very soluble in alcohol or ether **h cymene** $C_{10}H_{20}$ = 140 3 p-hexahydrocymol A colorless liquid, d 0 802, b 156, insoluble in water soluble in alcohol or ether **h hematoporphyrin** $C_{32}H_{32}O_6N_4$ = 552 5 A reduction product of hematin **h mellitic acid** $C_{12}H_{12}O_{12}$ = 348 2 $C_6H_6(COOH)_6$ Colorless crystals, decomp on heating soluble in water, alcohol or ether **h mesitylene** C_9H_{18} = 126 2 $C_6H_9Me_3$ 1 3-5-trimethylhexahydrobenzene Colorless liquid b 136 **h naphthalene** $C_{10}H_{14}$ = 134 2 A colorless liquid, d 0 924, b 208 **h naphthinoline** $C_{16}H_{16}N_2$ = 236 2 Colorless crystals m 128 **h phenol** Cyclohexanol **h pyridine** Piperidine **h pyrazine** Piperazine **h salicylic acid** $C_7H_{12}O_3$ = 144 1 $C_6H_{10}OH(COOH)$ Colorless crystals, m 110, very soluble in water, alcohol or ether **h thymol** Menthol **h toluene** C_7H_{14} = 98 2 $C_6H_{11}Me$ Colorless liquid, d 0 769 b 101, insoluble in water, miscible with alcohol or ether **h xylene** C_8H_{16} = 112 2 *meta*- Colorless liquid d 0 771 b 118 insoluble in water soluble in alcohol or ether *para*- Colorless liquid d 0 769 b 121 insoluble in water soluble in alcohol or ether

hexahydroxy- A prefix indicating the presence of six hydroxy groups **h benzene** Triquinoyl **h hexahydrobenzene** Inositol $C_6H_6(OH)_6$ **h lene** Hexahydro-xylene

hexaiodo- A prefix indicating the presence of six iodine atoms in a molecule **h benzene** C_6I_6 = 833 6 Reddish-brown needles

hexakontane Hexacontane

hexal Hexamethylenamine sulfosalicylate a compound of salicylic acid and urotropine used as a sedative

hexalet Trade name for hexamethylenetetramine salicylsulfonic acid

hexalin Cyclohexanol*

hexamethylated Describing an organic compound containing six methyl groups

hexamethylbenzene $C_{12}H_{18}$ = 162 2 C_6Me_6 Colorless rhombic crystals m 164, b 264 slightly soluble in alcohol

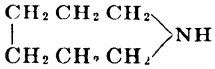
hexamethyldisilicane $Si_2(CH_3)_6$ = 146 26 A white solid or colorless liquid, m 13, b 112 5

hexamethylenamine Hexamethylenetetramine

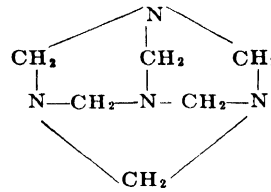
hexamethylene Cyclohexane* **amido-** $C_6H_{11}NH_2$ = 99 11 Aminohexahydrobenzene A colorless liquid, b 133 **diketo-, triketo-** q v **h amine** Hexamethylenetetramine **h diamine** (1) Triethylenediamine (2) See *diamine*

hexamethyleneamine Hexamethylenamine

hexamethyleneimine $C_6H_{13}N$ = 99 1 The heterocyclic ring-compound



hexamethylenetetramine $C_6H_{12}N_4$ = 140 2 Hexamethyleneamine, hexine, urotropine, hexamine, formin, aminoform, hex, naphthamine, uriton (cf *helmitol, galloformin*)



Colorless rhombic crystals, m 280, slightly soluble in alcohol or ether, soluble in water Used extensively in medicine as a urinary antiseptic, as a reagent for metals and alkaloids, as a rubber accelerator in the manufacture of synthetic resins, and as an absorbent for phosgene in gas masks

h alliodide A condensation product of h and allyl iodide, used as a reagent for cadmium **h bromethylene** Bromalin **h camphorate** Amphotropine, hexamethylenetetramine camphorate $(CH_2)_6N_4\ C_8H_{14}(COOH)_2$ A molecular combination of camphoric acid and hexamethylenamine A colorless, light crystalline powder, soluble in water or alcohol **h methylenecitrate** $C_7H_6O_7(CH_2)_6N_4$ = 342 3 Helmitol A white crystalline powder m 165 Used on account of its agreeable acidic taste instead of hexamethylenamine **h quinate** Quinotropine **h salicylate** Saliformin **h salicylsulfonic acid** Hexalet A white odorless crystalline powder, soluble in water, used as a diuretic **h sulfosalicylate** Hexal **h tannin** Tannopin **h tetraiodide** $(CH_2)_6N_4I_4$ = 647 6 Siomine A red powder decomp 138, used therapeutically in place of iodides

hexamethylparafuchsin Crystal violet

hexamethylviolet Crystal violet

hexamine The B P name for hexamethylenetetramine

hexanal* Caproaldehyde

hexanamide* Caproamide

hexanaphthene Cyclohexene

hexane* C_6H_{14} = 86 14 (1) Normal hexane, caproyl hydride, hexyl hydride $Me_2(CH_2)_4$ A colorless liquid d 0 658, m −94, b 69, highly inflammable, insoluble in water soluble in alcohol or ether, used as a solvent (2) $Me(CH_2)_2CHMe_2$ Ethylisobutane A colorless liquid, d 0 701, b 62, soluble in alcohol or ether (3) $Me_2(CH_2)_2Me$ Dusopropane A colorless liquid, d 0 67 b 58 soluble in alcohol or ether (4) Me_3CEt Trimethylethylmethane A colorless liquid, b 44 soluble in alcohol or ether **amino-** Hexylamine **bromo-*** Hexylbromide **chloro-*** Hexylchloride **h carboxylic acid** Heptoic acid **h dial*** Adipaldehyde **h diamide*** Adipamide **h dicarboxylic acid** Suberic acid **h dioic acid*** Adipic acid **h diol*** Hexamethylene glycol **h dioyl chloride*** Adipyl chloride

hexanitrin Mannitol nitrate

hexanitro- A prefix indicating the presence of six nitro groups **h diphenylamine** $C_{15}H_5N_7O_{12}$ = 439 10 Dipicrylamine, [*2 4 6*-$(NO_2)_3$-$C_6H_2]_2NH$ Yellow crystals, used as high explosive **h mannitol** A misnomer for mannitol nitrate **h phenyl sulfide** $C_{12}H_4N_6O_{12}S$ = 466 0 The compound $[C_6H_2(NO_2)_3]_2S$, used as high explosive

hexanoic acid Caproic acid

hexanol* (1) Hexylalcohol (2) Hexan-3-ol See *hexyl alcohol* (3)

hexanone* Ethyl propyl ketone

hexaphenyl (1) Sexiphenyl (2) Six phenyl radicals **h ethane** $C_{38}H_{30}$ = 486 24 The hydrocarbon $Ph_3C—CPh_3$ which is the dimer of a free radical, q v **h tin** $C_{32}H_{30}Sn_2$ = 699 62 $Ph_3Sn\ SnPh_3$ White crystals, m 232 5

hexasaccharose A polysaccharide of the general type $(C_6H_{10}O_5)_6\ H_2O$

hexatomic (1) Consisting of six atoms (2) Hexavalent

hexatriene C_6H_8 = 80 1 The unsaturated hydrocarbon, $CH_2\ CH\ CH\ CH\ CH\ CH_2$

hexavalent (1) Sexavalent An element or radical having six valence electrons, as Os (2) A compound containing six replaceable hydrogen atoms or hydroxyl groups

hexecontane Hexacontane

hexenal* $C_6H_{10}O$ = 98 08 α,β-hexenic aldehyde, propyl acrolein, $PrCH\ CH\ CHO$ An oil, b $_{17mm}$48, constituent of green leaves

hexene* (1) C_6H_{10} = 82 1 Tetrahydrobenzene Colorless crystals m 83 (2) Hexylene

hexenic* See *hexenoic**

hexenoic acid $C_6H_{10}O_2$ = 114 08 Hexenic acid **α- or 1 2-** Prophylacrylic acid, $MeCh_2CH_2CH\ CH\ COOH$ A white solid, d 0 965, m 32, b 217 **β- or 2 3-** Hydrosorbic acid, $MeCH_2$-$CH\ CHCH_2COOH$ A white solid d 0962 b 208 Cf *pyroterebic acid*

hexenoic aldehyde Hexenal*

hexenyl The monovalent unsaturated radical C_6H_{10}— derived from hexylene **h alcohol** $C_6H_{12}O$ = 100 1 The saturated alcohol, C_6-$H_{11}OH$ A colorless liquid d 0 891 b 137, soluble in water, alcohol, or ether

hexetone 3-Methyl-5-isopropyl-Δ^2-cyclohexenone Optically-active white crystals, used as cardiac stimulant

hexine (1) Hexyne* (2) Hexadiene (3) Hexamethylenetetramine

hexinic acid $C_6H_{10}O_3$ = 130 1 α-propyltetronic acid Colorless crystals m 126

hexitols $C_6H_{14}O_6$ = 182 11 A group of hexatomic alcohols as dulcitol mannitol sorbitol derived from hexoses

hexobiose A carbohydrate (disaccharide) consisting of two hexoses *e g* sucrose, lactose, maltose

hexodiose Hexobiose

hexogen Trimethylene trinitramine A constituent of high explosives

hexoic The monovalent radical $-CO(CH_2)_4Me$ **h acid** Caproic acid *pentahydroxy-* Galactonic acid **h aldehyde** Caproaldehyde

hexon(e) $C_6H_{12}O$ = 100 08 Methylisobutyl ketone, $Me_2CH\ CH_2\ COMe$ Colorless liquid, b 118, insoluble in water used as solvent for gums, resins nitrocellulose **h bases** Histon bases A group of organic bases which contain six carbon atoms and are formed by hydrolysis of proteins and histons, *e g* , lysine, histidine, arginine

hexonic acids A group of acids obtained by the oxidation of hexoses $C_5H_5(OH)_6COOH$ Cf *galactonic, gluconic, mannoic acids*

hexoran Hexachloroethane

hexosans A group of hemicelluloses (q v) which are hydrolysed to hexoses Cf *glucosans, fructosans*

hexose A carbohydrate (monosaccharide) containing six carbon atoms dextrose, fructose, glucose They are widely distributed in plants and animals and each occurs in three optical isomers (d-, l-, and i-)

hexotriose A carbohydrate (trisaccharide) consisting of three hexoses, *e g* , raffinose

hexoylene 2-Hexyne*

hexuronic acid A tetrahydroxy aldehyde acid obtained by oxidation of hexoses, $CHO(CHOH)$-$COOH$, as, glucuronic galacturonic, ascorbic acid

hexyl Enanthyl The monovalent radical C_6-H_{13}– or $Me(CH_2)_5$–, derived from n-hexane **h acetate** $C_8H_{16}O_2$ = 144 2 $AcOC_6H_{13}$ A colorless liquid, d 0 890, b 169, insoluble in water, miscible with alcohol or ether **h acetylene** Caprylidene **h alcohol** $C_6H_{14}O$ = 102 2 Hexanol*, capryl alcohol (1) Normal hexylalcohol, amylcarbinol, hexan-1-ol $Me(CH_2)_5OH$ A colorless liquid, d 0 820, b 158, slightly soluble in water, soluble in alcohol or ether (2) $MeCH(OH)(CH_2)_3Me$ Methylbutylcarbinol, hexan-2-ol A colorless liquid, d 0 833 b 137, slightly soluble in water, soluble in alcohol or ether (3) Et-$(CHOH)(CH_2)_2Me$ Ethylpropylcarbinol, hexan-3-ol A colorless liquid, d 0 834, b 134, slightly soluble in water, soluble in alcohol or ether (4) $Me_2C(OH)(CH_2)$ Me Dimethylpropylcarbinol A colorless liquid d 0 830, b 115 soluble in alcohol (5) $Me_2C(OH)$-$CHMe_2$ Dimethylisopropylcarbinol A colorless liquid, d 0 836, m −35 b 112 soluble in water, alcohol or ether (6) $Et_2C(OH)Me$ Diethylmethylcarbinol A colorless liquid, b 120, soluble in alcohol or ether (7) Me_3C-$CH(OH)Me$ Pinacolylalcohol tetramethylethanol A colorless liquid, d 0 835 m 4 b 120, soluble in alcohol **h aldehyde** Caproaldehyde **h amine*** $C_6H_{15}N$ = 101 2 Aminohexane A poisonous (ptomaine) base obtained by autolysis of protoplasm **h bromide** $C_6H_{13}Br$ = 165 02 *1*-Bromohexane*, Me-$(CH_2)_4CH_2Br$ Colorless liquid, d 1 1705 m −85, b 156 **h chloride** $C_6H_{13}Cl$ = 120 56 *1*-Chlorohexane* $Me(CH_2)_5Cl$ Colorless liquid d 0 8741, m −83, b 132 4 **h formate** $C_7H_{14}O_2$ = 130 2 The ester $HCOOC_6H_{13}$ A colorless liquid, d 0 898, b 153, miscible with alcohol or ether **h iodide** $C_6H_{13}I$ = 212 1 Iodohexane* A colorless liquid, d 1 453, b 70 **h methylketone** $C_8H_{16}O$ = 128 12 2-octanone A liquid, d 0 818, m −21 6, b 172 7 **h resorcinol** $C_{12}H_{18}O_2$ = 194 2 n-hexyl 2 4-dihydroxybenzene, caprokol $C_6H_{13}\ C_6H_3$-$(OH)_2$ A colorless crystalline powder, soluble in alcohol Used as a urinary antiseptic being more powerful than phenol and less toxic (Phenol coefficient 45 0–55 0) Cf *dihydranol*

hexylene C_6H_{12} = 84 1 (1) n-hexylene, Δ^1 hexylene, hexene*, $CH_2\ CH(CH_2)_3Me$ Colorless liquid, d 0 683, m −98, b 68, insoluble in water, soluble in alcohol or ether (2) Δ^2-hexylene $MeCH\ CH(CH_2)_2Me$ (3) Δ^3-hexylene, diethylethylene $MeCH_2CH\ CHCH_2Me$

hexylenglycol Pinacone

hexyleniodide $C_6H_{12}I_2$ = 337 8 Diiodohexane A yellowish liquid, decomp on heating, d 2 024

hexylic acid Caproic acid

hexyne* C_6H_{11} = 82 08 **1-** *n*-Butylacetylene 1-hexine, $Me(CH_2)_3C\ CH$ Colorless liquid, d 0 712, m −150, b 71 5 **2-** Methyl propyl acetylene, *2*-hexine hexoylene $MeC\ CPr$ A colorless liquid d 0 7377, b 84

Heyrovsky Jaroslav 1890– A Czechoslovak chemist, co-discoverer of rhenium (1925), and inventor of the polarograph, q v

Hf The symbol for hafnium

h f Abbreviation for high-frequency

Hg The symbol for mercury (hydrargyrum)

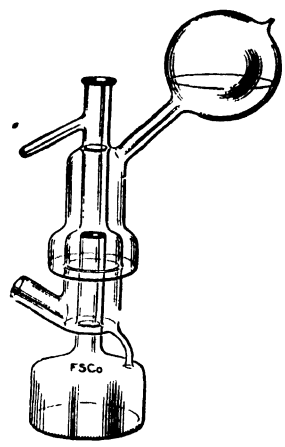
hg An abbreviation for hectogram (100 grams)

Hi The symbol for hibernium

hibernium Thorium-Ω A supposed new radioactive element of atomic number approximately 40, occurring in the black mica of Ytterby It has a half-life period of 10^{16} years (Joly 1922)

hibiscus Musk-seed

Hickman pump A diffusion pump for producing high vacua made of pyrex glass and butyl phthalate instead of mercury Cf *vacuum pump*, and see figure



Hickman pump

hiddenite An emerald-green variety of spodumene, used as gem

hiding power The opacity of a paint

hidrotic A substance that causes sweating as a diaphoretic or sudorific

hielmite Hjelmite A Ca, Fe, Mn and Yt tantalate and stannate found in Sweden as black rhombic crystals, d 5 8 hardness 5

hierro Spanish for iron

hiflash An oil having a high flash point

high Above the average great **h cranberry** Cramp bark **h explosive** A class of unstable chemicals or mixtures which detonate by a blasting cap, *e g*, dynamite, picric acid picrates chlorates, nitrotoluenes, nitrocellulose nitrostarch, tetranitroaniline, tetranitromethylaniline **h flash point** A substance generally a lubricating oil that ignites at high temperatures only **h frequency** Describing a rapidly-alternating electric current **h f spectrum** An x-ray spectrum, produced by a high-frequency current **h furnace** A blast furnace **h grade** (1) A pure substance (2) A concentrated substance (3) A rich ore **h speed steel** A steel rich in carbon used for tools Cf *ferrotungsten*

Hildebrand, Joel Henry 1881– An American chemist noted for his theory of solubility **H electrode** (a) A modified calomel electrode (q v) and cell (b) A platinum electrode in a bell-shaped tube, through which hydrogen passes, used as a hydrogen electrode, being partly immersed in the solution and partly exposed to the gas Cf *hydrogen-ion determination* **H rule** The molal entropy of vaporization, $M\lambda/T$, is a function of the molal concentration of the vapor involved Cf *Trouton's rule, Dieterici rule*

Hill bottle A weighing bottle with ground-in bulb and pipet **H filter** An apparatus for filtering by hydraulic pressure through a diatomaceous cylinder

Hillebrand, William Francis 1853–1925 An American chemist noted for his development of mineralogical analysis

Hilt's law In any single vertical section (*e g*, of coal seams) the deeper seams are of higher rank than the upper seams

hindered settling The resistance, other than that due to specific gravity which a liquid offers to the passage and settling of crushed ores in jigging

hindrance A lag or retarding factor **steric-** See *steric hindrance*

Hinds-Doremus ureometer A graduated glass apparatus for determining urea in urine

Hinman tube A glass apparatus for determining ammonia in illuminating gas

hinokitol $C_{12}H_{12}O_2$(?) A constituent of the coloring matter of certain Japanese woods

H-ion Hydrogen-ion **H-ion concentration** Hydrogen-ion concentration

hippocastanum The horse-chestnut, the seed and bark of *Aesculus hippocastanum* a Sapindaceae used as a tonic, narcotic and febrifuge

hippol $C_{10}H_9O_3N$ = 191 1 Methylene hippuric acid Colorless prisms m 151, soluble in water, used as an antiseptic

hippurate A salt of hippuric acid containing the monovalent $PhCONHCH_2COO-$ radical

hippuric acid $C_9H_9O_4N$ = 179 1 Benzoylglycine urobenzoic acid, benzaminoacetic acid, $PhCONHCH_2COOH$ Colorless crystals d 1 371 m 188, decomp on further heating soluble in hot water, alcohol or ether used as an antirheumatic and in organic synthesis **h aldehyde** $C_9H_9O_3N$ = 178 1 The aldehyde of hippuric acid $PhCONHCH_2CHO$

hippuryl The monovalent radical $PhCONHCH_2CO-$ derived from hippuric acid **h hydrazine** $C_9H_{11}O_2N_3$ = 193 1 or $Ph\,CO\,NH\,CH_2CO\,NHNH_2$ Colorless crystals, m 162, used in organic synthesis

hiptagin $C_{10}H_{14}O_9N_2$ = 306 2 A glucoside from *Hiptage madablota* Colorless silky needles, m 110

hiragashira oil An oil from the livers of *Scoliodon laticaudus*, d 0 9170, n_D 1 4752, containing scoliodinic acid

hiragonic acid $C_{16}H_{30}O_2$ = 244 2 A liquid, unsaturated fatty acid from sardine oil

hirathiol Ammonium sulfoichthyolate A synthetic sulfoichthyolate forming a brownish-black syrup of empyreumatic odor, soluble in water, used as a mild antiseptic

hircine (1) A strongly odorous fossil resin (2) The odorous principle in the suet of goats

Hirsch funnel A porcelain filter funnel, with a fixed perforated porcelain plate

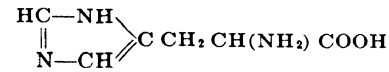
hirudine The active principle of a secretion from the buccal glands of leeches It prevents the coagulation of blood

hirudo The leech *Sanguisuga medicinalis*

histamine $C_5H_9N_3$ = 111 1 Ergamine, β-iminazolylethylamine, 4-imidazolylethylamine $C_3H_3N_2\,CH_2\,CH_2\,NH_2$ An amine derived from histidine, in ergot A powerful uterine stimulant, which lowers the blood pressure **h hydrochloride** The hydrochloride of histamine, which is more readily soluble than histamine

histazarin *2 3*-Dihydroxy anthraquinone

histidine $C_6H_9O_2N_3$ = 155 2 An amino acid derived from the protamin of fishes, or by the action of sulfuric acid on ptomaines



dl- Tetragonal prisms, m 285, soluble in water *d-* White scales, m 288, soluble in water *l-* Colorless leaflets, m 277 **thiol-** A constituent of proteins

histo- A prefix derived from the Greek denoting *tissue*

histochemistry The chemistry of the histological structures of the body

histogram Frequency curve

histology The branch of anatomy dealing with the structure of tissues **normal-** The study of healthy tissues **pathological-** The study of diseased tissues **phyto-** The science of plant-tissues **zoo-** The science of animal tissues

histolysis The disintegration or liquefaction of tissues

histon (1) Hexon bases (2) A protein from cell nuclei soluble in water insoluble in dilute ammonia, and coagulated by heat

Hitschen syringe A Y-shaped glass tube with rubber bulb and needle, used for injecting liquids and subsequently rinsing with salt solution without withdrawing the needle from the tissue

Hittorf, Johan Wilhelm 1824–1914 A German physicist and discoverer of the cathode rays **H cell** Transference cell **H numbers** Transport numbers **H tube** A modified Crookes' tube

hjelmite Hielmite

hl An abbreviation for hectoliter or 100 liters

hm An abbreviation for hectometer, or 100 meters **hm²** An abbreviation for square hectometer or 10 000 square meters **hm³** An abbreviation for cubic hectometer, or 1 000,000 cubic meters

HMT Hexamethylenetetramine

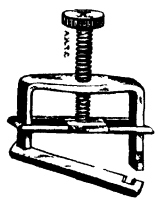
Ho The symbol for holmium

hoangnan The bark of *Strychnos malaccensis* a Loganiaceae used as arrow poison

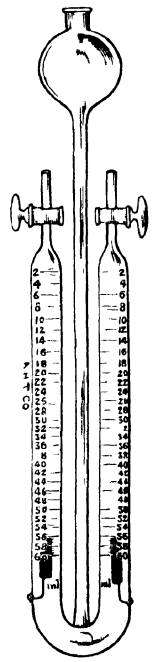
hoarhound Horehound

Hoff, Jacobus Hendricus van't See *van't Hoff*

Hoffman, Friedrich 1660–1742 A German physician and professor of chemistry, noted for analytical methods Cf *Hofmann* **H clamp** A clamp with one V-shaped and one flat jaw (see figure) **H drops**



Hoffman clamp



Hoffman electrolytic apparatus

A mixture of alcohol and ether **H electrolytic apparatus** A device for demonstrating the decomposition of water Two inverted burettes with platinum electrodes with an overflow tube and bulb (see figure)

Hofmann, August Wilhelm von 1818–1892 A German chemist and founder of the coal tar industry **H reaction** The shortening of carbon chains by eliminating CO In general bromine is added to the alkaline solution of an acid amine whereby the amine of the shorter carbon chain is formed according to the general reactions,

(a) $R\,CONH_2 + Br_2 = R\,CONHBr + HBr$
(b) $R\,CONHBr + 3NaOH = R\,NH_2 + Na_2CO_3 + NaBr + H_2O$

H sodium press An iron barrel, piston, and screw used for making sodium wire or ribbon for use in organic synthesis

Hofmeister schaelchen A bell-shaped form of thin glass dishes used in organic analysis **H series** For every emulsoid the anions and cations may be arranged in a definite order according to their powers of coagulation in neutral, acid or alkaline solutions Cf *lyotropic series*

hog bane Hyoscyamus

hog gum Kuteera gum gum hogg A variety of Bassora gum from *Sterculia urens* used in marbling paper

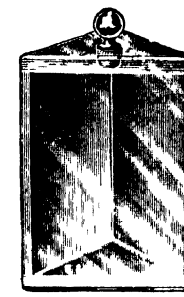
hog weed Scoparius

hogshead (1) A measure (hhd) containing 52 5 imperial gallons or 238 5 liters (2) A cask of varying capacity (100–140 gallons, U S A 50–100 gallons, British) **Irish-** 52 gallons **United Kingdom-** 54 gallons

holadin An extract of the pancreas containing its enzymes A grayish-white hygroscopic powder which slowly dissolves in water leaving an insoluble residue, used in medicine Cf *pancreatic* juice

Holborn-Kurlbaum pyrometer An instrument for determining high temperatures in furnaces

holder A device for retaining or holding objects in a definite position **animal-** A wire net or metal tube, used for keeping small animals in position while inoculating or taking their temperatures **buret-** A clamp to hold burets **clamp-** Boss Two iron screws used to attach clamps to supports **crucible-** A wire clamp or frame for holding crucibles **culture dish-** A wire frame for holding Petri dishes together while in the sterilizer **gas-** Gasometer **plate-** A light-tight box for holding photographic plates **specimen-** (1) A steel plate with notches to hold metallic samples on the microscope stage (2) A sample-bottle or museum jar **watch-glass-** A pair of circular wire springs for holding two watch glasses together



Hollow prism

hollander An early form of beater (q v)

hollow prism Three glass plates forming a hollowed glass prism, used to test the refractivity of liquids, or to obtain a longer (dispersed) spectrum when filled with a highly refractive liquid, *e g*, carbon disulfide

hollyhock (1) Althaea (2) The flowers of *Althaea rosea*, a Malvaceae, used as an emollient

holmia (1) A mixture of the oxides of holmium and dysprosium (2) Holmic oxide

holmic A compound of the trivalent Ho atom **h oxide** $Ho_2O_3 = 375\,0$ A grayish-white powder, insoluble in water

holmium Ho = 164 94 At No 67 A rare earth metal occurring in gadolinite, discovered by Soret in 1878 Its valency is three and its salts are slightly yellow **h chloride** $HoCl_3$ = 269 8 Holmic chloride A colorless powder soluble in water **h oxalate** $Ho_2(C_2O_4)_3$ = 591 0 A colorless powder insoluble in water **h oxide** Holmic oxide

holo- A Greek prefix indicating 'the whole" or entirety

holocaine $C_{18}H_{20}O_2N_2$ = 298 3 Ethenyl-*p*-diethoxydiphenyl amidine phenacaine Small, odorless colorless crystals, m 189 slightly soluble in water or alcohol, used as a local anesthetic **h hydrochloride** Phenacaine chloride The soluble or commercial form of holocaine, $MeC(NC_6H_4OEt)(NHC_6H_4OEt)\,HCl$

holocellulose The total carbohydrate constituents of wood

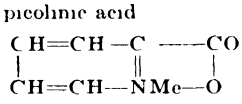
holohedral A crystal which has the full number of faces required for the maximum and complete symmetry of the system Cf *hemihedral*

holopon A trade-name of a preparation said to contain all the alkaloids of opium

holosiderite Meteoric iron

Holtz, Wilhelm 1836–1913 A German physicist **H machine** An induction machine

homarine $C_7H_7NO_2$ = 137 1 The methylbetaine of picolinic acid



found in mussels lobster muscles and *Arbacia pustulosa* Cf *trigonelline*

homatropine $C_{16}H_{21}O_3N$ = 275 2 A condensation product of tropine and mandelic acid tropinemandelate An alkaloid, colorless prisms, m 97, slightly soluble in water, soluble in ether or alcohol **h hydrobromide** $C_{16}H_{21}O_3N\,HBr$ = 356 2 Homotropine hydrobromide A more soluble form of homotropine occurring in colorless prisms m 213, soluble in water, alcohol or ether Used in ophthalmology **h hydrochloride** $C_{16}H_{21}O_3N\,HCl$ = 311 2 Homotropine hydrochloride A more soluble form of homatropine occurring in small white crystals m 216, soluble in water, alcohol or ether Used in ophthalmology

homeopathic Pertaining to homeopathy **h dose** An extremely small amount **h vial** An elongated bottle used for homeopathic tablets

homeopathy A system of medicine employing extremely small doses of agents which if administered in health would produce symptoms similar to those for the relief of which they are given

homilite $FeCa_2B_2Si_2O_{10}$ A borosilicate of calcium and iron d 3 0–3 28, hardness 5 5 soluble in HCl

homo- (1) A prefix derived from Greek indicating "similarity" (2) In names of organic compounds it indicates a difference of $—CH_2—$, but an otherwise similar structure

homoantipyrine $C_{12}H_{14}ON_2$ = 202 2 1 2 3-phenylethylmethylpyrazolone Colorless crystals, m 73

homoarecoline $C_9H_{15}O_2N$ = 169 2 Ethoxyarecaidine A yellow liquid, soluble in water, alcohol, ether, or chloroform **h hydrobromide** $C_7H_{10}EtO_2N\,HBr$ Colorless crystals m 118, soluble in water or alcohol, used as an anthelmintic

homoatomic ring Homocycle

homoatropine Homatropine

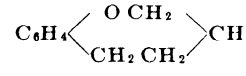
homocamphoric acid $C_{11}H_{18}O_4$ = 214 1 An acid, similar to camphoric acid but having a $—CH_2—$ bridge Distillation of its calcium salts yields camphor

homocentric Having the same center **h rays** Light rays that are parallel or have a common focus

homochelidonine $C_{21}H_{21}O_5N$ = 347 2 An alkaloid from the seeds of *Chelidonium majus* and sanguinaria Colorless crystals, slightly soluble in alcohol or ether, soluble in chloroform

homochemical A compound or molecule which consists of two types of atoms only, as a binary compound

homochroman $C_{10}H_{12}O$ = 148 1 The heterocyclic hydrocarbon



homochromic Possessing the same color, but a different molecular composition

homochromoisomers Substances having similar absorption spectra but different molecular compositions

homocycle A ring compound or closed chain composed of the same type of atoms generally carbon atoms Cf *heterocycle*

homocyclic Pertaining to a compound which contains a closed chain or to a ring consisting of atoms of the same type usually carbon atoms *e g* benzene

homogeneity Matter which is uniform throughout or has at all points the same property or composition Cf *heterogeneity*

homogeneous Of uniform or similar nature throughout Antonym heterogeneous

homogentisic acid $C_8H_8O_4$ = 168 06 2 5-dihydroxytoluic acid $(HO)_2C_6H_3CH_2COOH$ Colorless crystals, m 147 It is formed as an intermediate in the oxidation of tyrosine and phenylalanine, and occurs in urine during alkaptonuria

homoisohydric Having the same ions always present in the solution, and a constant hydrogen ion concentration

homolevulinic acid $C_6H_{10}O_3$ = 130 08 δ-methyl levulinic acid γ-ketocaproic acid $EtCOCH_2CH_2COOH$

homolog, homologue Member of a series of compounds whose structure differs regularly by some radical (*e g* $=CH_2$) from that of its adjacent neighbours in the series

homologous Of similar structure **h lines** A pair of spectrum lines the relative intensities of which are independent of variations in the conditions of the electrical discharge producing them In quantitative spectroscopy one may be due to the main component the other to the impurity to be determined by the logarithmic sector method, q v **h series** A series of organic compounds which differ by CH_2 or some other multiple These series are not limited to hydrocarbons, but refer also to alcohols, ethers, etc Cf *methane series alcohols, acids, phenols, amines, benzene series, etc*

homologue Homolog

homology The similarity of organic compounds and their gradation of properties, as shown by the homologous series obtained when they are arranged in order of the number of carbon atoms they contain

homometric Having the same x-ray pattern

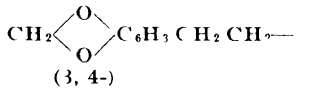
homophase Forming a single and similar state of aggregation Cf *phase*

homophthalic acid $C_9H_8O_4$ = 180 11 $C_6H_4(CH_2COOH)(COOH)$ (ortho-)

homophthalimide $C_6H_4\langle^{CH_2CO}_{CO}\rangle NH$, derived from homophthalic acid

homophthalonitrile Cyanbenzylcyanide

homopiperonyl The monovalent radical



(3, 4-)

homopolar (1) An equal distribution of electric charges between two atoms (generally carbon atoms) neither of which becomes negative or positive, hence a bond, q v, in which both atoms share equally the electron pair (2) Covalent

homopyrocatechol $C_7H_8O_2$ = 124 1 *3 4*-Dihydroxytoluene, *4*-methylpyrocatechol (1 3 - 4) $MeC_6H_3(OH)_2$ Colorless prisms m 51 b 251, very soluble in water, alcohol or ether, used in organic synthesis Cf *orcinol*

homopyrrole Methyl pyrrole

homoquinine $C_{19}H_{22}N_2O_2$ 2H O A crystalline alkaloid from cinchona bark

homorenon $C_{19}H_{11}NO_3$ = 301 1 Ethylamino acetocatechol, $(HO)_2C_6H_3CO\,CH_2\,NHMe$ A white powder

homosalicylic acid $C_8H_8O_3$ = 152 1 Cresotic acid A compound containing a —COOH —OH, and CH_3— group attached to the benzene ring There are the following ten possibilities

Position of (COOH)	(OH)	(CH_3)		
1	2	3	= 3-methyl-o-oxybenzoic acid	m 163
1	2	4	= 4-methyl-o-oxybenzoic acid,	m 177
1	2	5	= 5-methyl-o-oxybenzoic acid,	m 151
1	2	6	= 6-methyl-o-oxybenzoic acid	m 168
1	3	2	= 2-methyl-m-oxybenzoic acid,	m 183
1	3	4	= 4-methyl-m-oxybenzoic acid	m 206
1	3	5	= 5-methyl-m-oxybenzoic acid,	m 208
1	3	6	= 6-methyl-m-oxybenzoic acid	m 172
1	4	2	= 2-methyl-p-oxybenzoic acid,	m 177
1	4	3	= 3-methyl-p-oxybenzoic acid,	m 172

homosaligenin Salicyl alcohol

homotaraxasterol $C_{30}H_{40}O$ = 356 31 A sterol, m 164 from dandelion

homotope Any one of the elements in a vertical group of the periodic system, thus Br is a h of Cl, Tl a h of Ga

homotropine Homatropine

homozyme Vitagen

Honduras bark Cascara amarga

hone A mounted stone used for sharpening razors and dissecting knives

honey Mel

honeystone $Al_2C_{12}O_{18}$ $18H_2O$ Aluminum mellate, mellite A yellowish or reddish, soft, resin-like mineral, d 1 6, hardness 2, soluble in nitric acid or sodium hydroxide

Honigschmid, Otto 1878– A German chemist noted for inorganic work

honing guide A device for keeping the dissecting knife at the proper angle while honing

hood A glass-enclosed ventilator shaft or flue in the laboratory which carries away the acid or poisonous fumes that arise from chemicals manipulated in it, by the worker who stands outside the hood

hoof and horn meal A fertilizer made by processing drying and grinding hoofs and horns It contains 11–15 % N, but is not readily available as plant food

Hooke, Robert 1635–1703 An English philosopher and pioneer in scientific experimentation **H's law** The stress applied to stretch or compress a body is proportional to the strain or alteration in length, so produced This is true so long as the limit of elasticity is not exceeded

hoolamite A mixture of pumice iodine pentoxide and fuming H_2SO_4 used as absorbing agent and reagent for carbon monoxide which changes in color from white through blue-green to violet-brown

hopcalite (1) A mixture of cobalt copper, silver, and manganese oxides, used in gas-masks as a catalyst to oxidize carbon monoxide (2) A mixture of manganese dioxide and cupric oxide (3 2), prepared by heating hydrated manganese oxide and copper carbonate

Hopfner process A method of recovering copper by electrolysis

hopogan A trade name of magnesium peroxide

hop oil A green odorous oil distilled from hops Its chief constituents are terpenes humulene and geraniol, used in flavoring extracts Cf *humulene* **Spanish-** Origanum oil

hopper A funnel-shaped trough or trap

Hoppe-Seyler, Ernst Felix Immanuel 1825–1895 A German physiologist noted for the development of biochemical analysis

hopred $C_{38}H_{26}O_{15}$ = 722 2 A hydrolytic split-product of the coloring matter, phlobabene, from hops

hops Humulus The dried spikes or strobiles of *Humulus lupulus* in Urticaceae (Moraceae) They contain tannin humulon and lupulin (q v) and have a bitter aromatic taste Used, as the extract, as aromatic bitter and stomachic, and in beer as a flavoring and preservative **h oil** See *hop oil* **h substitutes** Bitter principles such as quassia or camomile

horbachite A native sulfide of gold, iron and nickel

hordein A protein of barley, the seeds of *Hordeum sativum*

hordeine Hordenine

hordenine $C_{10}H_{15}ON$ = 165 2 Hordeine, ephedrine p-oxyphenyl-dimethylethylamine An amine alkaloid, m 117 8, from malted barley, which is used to cure diarrhea and dysentery

hordeum Barley

horehound The dried leaves and flowering tops of *Marrubium vulgare* used as a fluid extract as an expectorant and stimulant Cf *marrubiin*

horismascope An albuminometer used in clinical analysis It consists of a U-tube with arms of unequal diameters, with which it is possible to perform ring-reactions

hormone One of a group of substances produced by the internal secretion of glands which acts as an accelerating or retarding catalyst in metabolism and other internal reactions They are specific directive substances of the organism, and considered to be ' chemical mes-

sengers," which by circulation in the bloodstream coordinate the functions of organs by exciting the latter to activity **food-** Vitamin **plant-** H which promote growth of plants, *e g* auxin they especially favor the formation of roots, as indole butyric acid naphthalene acetic acid and phenyl acetic acid

HORMONES

*Class**	*Name and formula*	*Source*
	1 Isolated and synthesized	
1	adrenalin, $C_9H_{12}NO$	suprarenal medulla
1	thyroxin $C_{11}H_{11}NO_4I_4$	thyroid gland
3	progestin $C_{21}H_{30}O$	corpus luteum
3	oestrone, $C_{18}N\ O$, m 257	ovarian follicles
3	oestriol $C_{18}H_{24}O_3$	ovarian follicles
3	androstenedione $C_{19}H_{26}O_2$	testicular extract
	2 Isolated and crystallised	
2	insulin $C_{45}H_{69}N_{11}O_{14}$	pancreas
2	oxytocin	posterior pituitary
2	vasopressin (α,β-hypophamin)	posterior pituitary
	3 Concentrated in form of extracts	
3	relaxin	corpus luteum
3	cortin	suprarenal cortex
2	elityran	anterior pituitary
2	prolan	anterior pituitary
2	rho 1	anterior pituitary
2	rho 2	anterior pituitary
	callicrein	pancreas
	4 Present in organs, but not concentrated	
	secretin	intestines
	sympathin	supposed hormone
	placental hormone	
	thymus hormone	
	pineal hormone	
	mammary hormone	

* *1* = Amino acid *2* = Peptide *3* = Lipoid, or cholane derivative

horn A substance composed mostly of keratin and containing insoluble mineral salts particularly calcium phosphate **h fiber** See *fiber vulcanized* **h scoop** A small shovel made of horn, for handling chemicals, especially in weighing and filling bottles **h spatula** A flattened stick made of horn used for handling chemicals **h spoon** A spoon made of horn used for handling chemicals

hornblende $Ca(MgFe_2)(SiO_3)_4$ A variety of amphibole occurring in colors ranging from black through green and olive to white

hornlead Phosgenite

hornquicksilver A native mercurous chloride

hornsilver Argentum cornu

horsechestnut The seeds of *Aesculus hippocastanum* used (as fluid extract) as a tonic astringent and febrifuge **h bark** The bark of *Aesculus hippocastanum*, used medicinally as a fluid extract **h tannin** $C_{76}H_{24}O_{11}$ = 528 2 A tannin from the wood, leaves and bark of the h and the root of the apple tree, used in tanning

horsehair The hair from the mane or tail of horses, used for mattresses and fabrics **vegetable-** Spanish moss The fibers of *Tillandsia usneoides* a Bromeliaceae of America, used for pillows and mattresses

horsemint oil Monarda oil A reddish-brown essential oil, obtained by distilling the leaves and stems of *Monarda punctata* used in pharmacy in the preparation of liniments Cf *monarda*

horsenettle See *solanum* **h berries** Solanum

horse oil A yellowish-brown oil from horse fat used in soap manufacture

horsepower A unit of power or the rate of doing work 1 HP = 33000 ft pd per minute = 550 ft pd per second = 76 kg m per sec = 745 8 watts = 2 545 B T U **American-** 1 HP = 746 watts **Continental-** 1 HP = 736 watts

horseradish The root of *Cochlearia armoracia*, a cruciferous plant used as a condiment or, as a fluid extract, as a stomachic, stimulant and diuretic It contains potassium myronate

horseshoe magnet A magnetized iron bar bent U-shape

horsetail See *aconitic acid Equisetum*

horsfordite Cu_6Sb A native copper-antimony ore

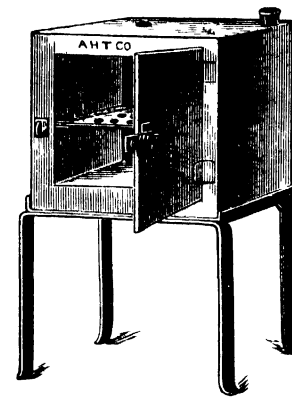
Hortvet cryoscope An apparatus for the determination of the freezing point of milk, sugar solutions or oils **H tube** A graduated glass tube used in a centrifuge for determining the volume of a precipitate or sediment

Horwood process A method of flotation of partly-roasted sulfides of Fe Cu Pb, and Zn, and separation of the zinc

hose connector A metal tube with outside concentric ribs or corrugations, by which the ends of rubber tubes are joined together

Hoskin furnace An electric heating device for obtaining high temperatures Used in metallurgical and dental laboratories

hot Having or producing the sensation of heat **h air sterilizer** A metal-box with a double door heated by gas or electricity, used to sterilize glass ware and instruments **h bed** A mass of fermenting material whose heat is used to accelerate the growth of plants **h plate** A metal plate, heated electrically used in laboratories for distillation crystallization evaporation, etc **h water funnel** A double-walled metal funnel By circulating a hot liquid through the walls the solution to be filtered is kept at the desired temperature Used *e g*, in filtering gelatin and agar solutions **h wire gage** Gage



Hot air sterilizer

hour The unit of time, 60 minutes, 3600 sec, $\frac{1}{24}$ of a civil day

Howard chamber A microscope slide with a small counting chamber, used for counting yeast cells molds etc **H pan** A jacket and coil type of vacuum evaporating kettle, used to concentrate sugar juice

Howe, Harrison Estell 1881–1942 An American chemist, noted for his development of industrial chemistry

howler A microphone hummer or audio-oscillator used as an end-point detector for Wheatstone bridges

HP or **h p** An abbreviation for horse-power

huantajayit A native sodium-silver chloride

huanuco bark. Cinchona bark.
Hübl number. Iodine number.
H. solution. A solution of iodine and mercuric chloride used to determine iodine numbers of unsaturated compounds.
hübnerite. $MnWO_4$. A native manganese tungstate occurring in the Western part of the United States, as a dark red crystalline mineral, d.7.17, soluble in HCl. It contains less than 20 % of iron tungstate. Cf. *ferberite.*
Hudson, Claude Silbert. 1881– . An American chemist, noted for work on enzymes and carbohydrates. **H. rule.** To assign α and β to a sugar in comparison with their molecular rotation, R_α and R_β, select names so that $R_\alpha - R_\beta$ is equal to and of the same sign as the difference for the two corresponding forms of glucose.
hue. A property of color, q.v.
Huff separator. An electrostatic concentrator for crushed ores. The ore travels over a charged belt, and falls through an electric field whereby the charged ore particles are separated.
huile. French for "oil."
Hulett, George Augustus. 1867– . An American physical chemist. **H. still.** A device for distilling mercury.
hülsneride. $FeWO_4$. A native ferrous tungstate.
humboldite. A variety of melilith, an aluminum iron silicate.
Humbold penetrometer. A device for testing asphalt by measuring its resistance to the pressure of a needle.
humic acid. A general term for the acids derived from humus.
humidity. Dampness, hygrometric state. The amount of water vapor in the air. **absolute-** The actual moisture content of air, in grams per cubic meter. **relative-** The weight of water vapor (expressed as a percentage) contained in a given volume of air divided by the weight which would be contained in the same volume of saturated air at the same temperature. See *dew-point, hygrometer.*
humidor. A compartment in which the atmosphere is kept saturated with water vapor.
huminite. A native hydrocarbon from Sweden.
humite. Chondrodite. A basic magnesium fluosilicate.
hummer. A microphone used in conductivity measurements, to determine a point at which no current is passing by the absence of the humming.
humoceric acid. $C_{19}H_{34}O_2$ = 294.26. An acid from peat wax.
humulene. $C_{15}H_{24}$ = 204.19. A sesquiterpene from the hop oil. A colorless liquid d.0.9001, b.265.
humulic acid. $C_{15}H_{22}O_4$ = 266.2. A compound formed by the action of alkali on humulon.
humulin. Lupulin.
humulon. $C_{21}H_{30}O_5$ = 362.2. A bitter constituent, m.66, of the soft resin of hop lupulin (cf. *lupulon*).
humulo tannin. $C_{25}H_{24}O_{13}$ = 532.2. A white amphoteric powder obtained from hops. It loses water at 130°C, and forms a phlobabene.
humulus. Hops.
humus. (a) The top-layer of the soil containing the organic decomposition products of vegetation (leafmold, rotten wood, etc.). (b) The decayed products of plant life. Cf. *gainic acid.*
Hünefeld solution. A reagent for the detection of blood:

25 cc. alcohol	1.5 cc. glacial acetic acid
5 cc. chloroform	15 cc. old turpentine.

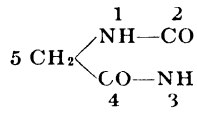
Huntington mill. An ore crusher in which steel rollers are pressed by centrifugal force against a heavy encasing steel ring.
Huppert's reagent. A 10 % aqueous solution of calcium chloride, used in urine analysis for the detection of biliary pigments.
hurricane drier. An air-drying chamber used for textiles, especially wool.
Huyghenian ocular. Negative ocular. A magnifying lens used as an eyepiece on a microscope or telescope. It consists of two convex lenses mounted convex sides down, whereby the field of the microscope is enlarged. Cf. Ramsden *ocular.*
Huyghens, Christiaan. 1629-1695. A Dutch physicist noted for the development of optical instruments, and for his wave theory of light.

Christiaan Huyghens.

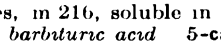
hyacinth. A transparent red variety of zircon, used as a gem. The term is erroneously applied to light-colored garnet, to yellowish-red spinel from Brazil, and to red quartz. **Ceylon-** Garnet. **false-** Garnet. **oriental-** Corundum (rose-colored).
hyacinthozontes. A sapphire-blue beryl used as a gem.
hyaenasic acid. Hyenic acid.
hyaline. Resembling glass.
hyalite. A clear, colorless opal used as a gem.
hyalophane. $(K_2,Ba)Al_2(SiO_3)_4$. A barium feldspar.
hyalosiderite. A deep olive-green olivine, used as a gem.
hyaluronic acid. A viscous mucopolysaccharide (q.v.) in skin.
hybrid. An organism, usually a plant, obtained by cross-breeding.
hychlorite. Antiformin.
hycoloid. Trade name for a cellulose nitrate plastic.
hydantoic acid. $C_3H_6O_3N_2$ = 118.1. Carbamido acetic acid, carbamyl glycine, glycoluric acid, $NH_2CONHCH_2COOH$. Colorless prisms, m.-171, slightly soluble in water, alcohol, or ether.

iso- $NH_2C(NH)OCH_2COOH$ **phenylthio-** $C_9H_{10}N_2O_2S$ = 210 07 (1) *ϕ*-iminocarbimin thio glycolic acid, NH C(NPh)S CH_2COOH White needles m 150, insoluble in water (2) *ortho-* PhNH C(NH) S CH_2COOH White crystals

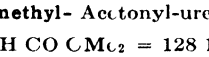
hydantoin $C_3H_4O_2N$ = 100 1 Glycolylurea, imidazoledione The pentatomic ring compound



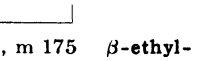
Colorless needles, m 216, soluble in hot water or alcohol Cf *barbituric acid* **5-carbamido-** Allantoin ***α*-dimethyl-** Acetonyl-urea



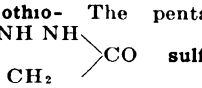
Colorless crystals, m 175 ***β*-ethyl-**



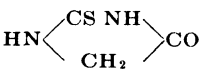
1-ethylhydantoin Colorless crystals, m 100 **ethylphenyl-** Nirvanol ***α*-methyl-**



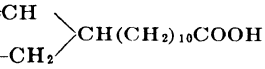
5-methylhydantoin, lactylurea Colorless crystals, m 140 ***β*-methyl-** NMe CO NH CO CH_2 1-methylhydantoin Colorless needles, m 157 **pseudothio-** The pentatomic heterocycle



sulfo- Pseudothiothio- The pentatomic heterocycle



hydnocarpic acid $C_{16}H_{28}O_2$ = 252 22 *κ*-Δ$^{\alpha}$-cyclopentenyl undecylic acid,



White crystals, m 60, from the seeds and oil of *Hydnocarpus* species, used in the treatment of leprosy Cf *chaulmoogric acid*

Hydnocarpus A genus of trees, Bixaceae, whose seeds yield oils used in leprosy, as, kavatel oil, maroti oil Cf *arabin, avenyl, chaulmoogra oil* **h oil** An oil of *H wightiana*, d 0 947, m 20 5–24 0

hydr- A prefix derived from Greek indicating water or hydrogen

hydracetamide $C_6H_{12}N_2$ = 112 2 $(MeCH)_3N_2$ A yellow powder, soluble in water or alcohol

hydracetin Pyrodin

hydracid An acid without oxygen atoms, as HCl or HCN

hydracrylic acid $C_3H_6O_3$ = 90 1 *β*-Hydroxypropionic acid, ethylene lactic acid, *3*-hydroxypropanoic acid* CH_2OHCH_2COOH A colorless crystalline mass, decomp on heating **amino-** Serine **phenyl-** Tropic acid

hydracrylo The trivalent radical $HOCH_2CH<$ **-C≡ h nitrile** C_3H_3NO = 71 05 *β*-Hydroxypropanenitrile*, ethylene cyanohydrin $HO(CH_2)CN$ A colorless liquid, d 1 059, b 221, soluble in water or alcohol

hydragog(ue) A cathartic producing a profuse and watery stool *e g* elaterine jalap colocynth, magnesium citrate, sodium sulfate

hydramine A hydroxyalkylamine or glycol in which a hydroxyl group is replaced by an amine radical HO R NH_2 or HO R NR_2

hydramyl Pentane

hydrangea Seven barks The dried roots of *Hydrangea arborescens* a saxifragaceous shrub Used in a fluid extract, as a cathartic and diuretic

hydrangin $C_{34}H_{25}O_{11}$ = 609 39 A glucoside from hydrangea

hydranthranol Hydroanthranol

hydrargillit $Al(OH)_3$ A native aluminum hydroxide, colorless needles

hydrargotin Mercurous tannate

hydrargyrol $C_6H_4OH\,SO_3Hg$ = 373 7 p-Phenyl mercury thionate An antiseptic

hydrargyrum The Latin for mercury

hydrastin A concentrate containing the principles of golden seal

hydrastine $C_{21}H_{21}O_6N$ = 383 3 An alkaloid from *Hydrastis canadensis*, golden seal White prisms m 132 slightly soluble in water, alcohol or ether, used as an alterative and uterine hemostatic **h hydrochloride** $C_{21}H_{21}O_6N$ - HCl = 419 77 The more soluble hydrochloride of hydrastine A colorless, hygroscopic powder, soluble in water or alcohol

hydrastinine $C_{11}H_{13}O_2N$ = 207 1 A decomposition product of hydrastine Colorless crystals m 116 slightly soluble in water **h hydrochloride** $C_{11}H_{12}O_2\,N\,HCl$ = 242 6 A yellowish crystalline powder, m 210 soluble in water or alcohol used as an astringent and hemostatic

hydrastis Golden seal, yellow pucoon, orange root, turmeric root The dried roots of *H canadensis*, a ranunculaceous plant The fluid extract is used medicinally as a bitter tonic and astringent **h alkaloids** Compounds of the isoquinoline group, as, berberine, canadine, hydrastine hydrastinine, xanthopuccine

hydratated Combined with water in the form of a hydrate Cf *hydrated*

hydrate (1) A substance containing water combined in the molecular form, as $H_2SO_4\,H_2O$ (2) Aqua compound A crystalline substance containing water of crystallization They are classified according to the number of molecules of water which crystallize with one molecule of substance

monohydrate	$1H_2O$
dihydrate	$2H_2O$
trihydrate	$3H_2O$
tetrahydrate	$4H_2O$
pentahydrate	$5H_2O$
hexahydrate	$6H_2O$
heptahydrate	$7H_2O$

etc (3) Hydroxide (4) A solvate, q v **carbo-** See *carbohydrate*

hydrated Combined with water Cf *hydrate solvate* **h ion** An ion surrounded by oriented water molecules, cf *aquation, micelle, solvation zone* **h lime** Dry calcium hydroxide

hydration Combination with water, but not necessarily in the form of a hydrate Cf *aquation, solvation* **heat of-** The energy difference between anhydrous and hydrous compounds, expressed in calories

hydratisomery An isomerism that depends upon the structure of hydrated crystals Thus,

$CrCl_3\,6H_2O$, chromic chloride hexahydrate, occurs in the following three forms

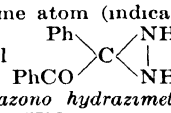
grayish-blue	$[Cr(H_2O)_6]Cl_3$
grayish-green	$[Cr(H_2O)_5Cl]Cl_2\,H_2O$
green	$[Cr(H_2O)_4Cl_2]Cl\,2H_2O$

hydratropic acid $C_9H_{10}O_2$ = 150 1 α-phenylpropionic acid, α-methyl-α-toluic acid, Ph CH-MeCOOH Colorless crystals, m 265, slightly soluble in water **hydroxy-** Atrolactic acid

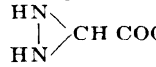
hydraulic Pertaining to liquids, especially water **h cement** A cement which sets under the action of water, instead of atmospheric CO_2 and moisture **h lime** A variety of limestone which, on burning, yields a quicklime that will set or harden under water Cf *hydrated lime* **h mining** Excavating by means of a strong jet of water **h mortar** A mortar which will harden under water **h press** An extraction press of great force using water to transmit the pressure, used in bacteriology and chemical work

hydraulics Hydro mechanics A branch of physics which deals with the mechanical properties of liquids

hydrazi- A prefix indicating the presence of the bivalent group where both valencies belong to the same atom (indicated by a dot)

e g hydrazibenzyl 

Cf *hydrazo, hydrazono hydrazimethylene*

hydraziacetic acid  which is hydrolyzed by acids to hydrazine and glyoxylic acid

hydrazide An acyl hydrazine, an organic compound of the type R CO NH NH_2, as C_3H_7-CONH NH_2, butyrohydrazide* or propane carbohydrazide They are metamers of diureides Cf *malein hydrazide* **acet-** See *acethydrazide* **carbo-** See *carbohydrazide* **oxy-** See *oxyhydrazide*

hydrazidine (1) A compound containing the bivalent —NH N C NH_2 group Cf *amidrazones* (2) The theoretical compound NH_2 N-C H NH_2 **ethylphenyl-** PhNH N CEt NH_2 methylamidrazone

hydrazido mesoxalamide $C_3H_6O_2N_4$ = 130 2 NH_2 N C(CONH$_2$)CONH$_2$ Colorless crystals, m 175

hydrazimethylene The theoretical compound from which the hydrazi compounds are derived **benzoylphenyl-** NH NH CPh-(COPh) Colorless crystals, m 151 **diphenyl-** (NH NH CPh)$_2$ Colorless crystals m 147

hydrazine N_2H_4 = 32 1 Diamine, diamidogen, H N— NH_2 A colorless liquid d 1 08, m 1 4, b 113 soluble in water or alcohol Used extensively as a reducing agent in organic synthesis In liquid ammonia solution it acts as nitridizing agent analogously to the oxidizing action of H_2O_2 in aqueous solution It gives the following radicals

H N NH—	hydrazino, hydrazyl
H_2N N=	hydrazono
—HN NH—	hydrazo, hydrazi
=N N=	azo, diazo

Cf *hydrazinium, hydrazidine* **h carbamide** Diurea **h carboxamide** Semicarbazide **h carboxylic acid** Carbazic acid **h dicarbamide** Biurea **h chloride, h dihydrochloride** $N_2H_4\,2HCl$ = 105 5 Colorless crystals, m 198, soluble in alcohol or ether, used in organic synthesis **h formate** $N_2H_4\,2HCOOH$ = 124 08 Cubic crystals m 128, soluble in water **h hydrate** $N_2H_4\,H_2O$ = 50 07 A colorless solid m −40 b $_{40mm}$ 118 5 **h nitrate** NH_2-$NH_2\,NO_3$ White crystals used as a high explosive **h sulfate** $N_2H_4\,H_2SO_4$ = 130 1 Colorless scales, m 254 soluble in water, insoluble in alcohol or ether, used as a reagent in separating copper and in organic synthesis

hydrazines A series of compounds derived from hydrazine H_2N—NH_2, as *methylhydrazine*, MeNH NH_2, or *phenylhydrazine*, PhNH NH_2 They are analogous to peroxides **acyl-** Hydrazides **alkyl-** A compound of the type RNH NH_2, R_2N NH_2, or RNH NHR, in which the hydrogen is replaced by an alkyl radical **aryl-** An organic compound derived from hydrazine, in which the hydrogen is replaced by an aryl radical

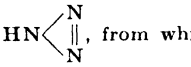
hydrazinium Hydrazonium The monovalent radical H_2N NH_3—, or the bivalent radical —NH_3 NH_3—, which is derived from hydrazine and contains respectively, one and two pentavalent nitrogen atoms **h salt** A compound of hydrazine and an acid, analogous to the ammonium salts derived from ammonia Thus, there are N_2H_4 HCl, *i e* H_2N NH_3Cl, h chloride, and $N_2H_4\,2HCl$, *i e* $ClNH_3$ NH_3Cl, h dichloride

hydrazino The monovalent H_2N NH— group derived from hydrazine **h acids** A group of organic compounds, derived from hydrazine, of the general type H_2N NH R COOH, as, α-hydrazino-propionic acid, H_2N NH CHMe-COOH, or amidoalanine

hydrazo- A prefix indicating the presence of the bivalent —NH NH—, or the tetravalent =N N= group (The latter is properly called the azo-group) Cf *hydrazi, hydrazono* **h amine** Triazane **h benzene** $C_{12}H_{12}N_2$ = 184 2 **1 1-** See *1 1-diphenylhydrazine** **1 2-** *1 2-* Diphenylhydrazine*, *N*-bianiline, PhNH-NHPh Colorless scales d 1 158 m 132, slightly soluble in water or alcohol soluble in ether It is an intermediate in the manufacture of benzidine **h benzoic acid** See *benzoic acid* **h compounds** A group of organic compounds of the general formula RNH NHR **h dicarbonamide** $C_2H_6O_2N_4$ = 118 3 Hydrazoformamide, NH_2 CO NHNH-CO NH Colorless leaflets m 245 slightly soluble in water **h dicarbonimide** Urazole **h formamide** H dicarbonamide **h naphthalene** $C_{20}H_{16}N_2$ = 284 2 Dinaphthylhydrazine $C_{10}H_7NH$ $NHC_{10}H_7$ **1 1-** (alpha-) Colorless leaflets, m 275, insoluble in water, soluble in alcohol or ether, used in organic synthesis **2 2-** (beta-) White flakes, m 163, insoluble in water, soluble in alcohol or ether **h toluene** $C_{14}H_{16}N_2$ = 212 2 Ditoluylhydrazine MeC_6H_4NH NHC_6H_4Me **1 2-** (ortho-) Colorless leaflets m 156, slightly soluble in water, soluble in alcohol or ether, decomp by heat **1 3-** (meta-) Colorless crystals, soluble in alcohol **1 4-** (para-) Monoclinic, colorless crystals, m 130, insoluble in water, soluble in alcohol, used in organic synthesis

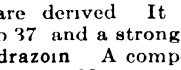
hydrazoate A compound derived from hydrazoic acid, NH N N, as sodium hydrazoate, NaN_3

hydrazoic acid HN_3 = 43 03 Hydronitric acid, azoimide, diazoimide, NH—N = N or



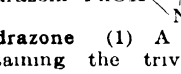
, from which the unstable hydrazoates are derived It is highly explosive m −80, b 37 and a strong protoplasmic poison

hydrazoin A compound containing the trivalent

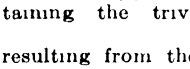


or —CH N N— group, as benzhydrazoin PhCH

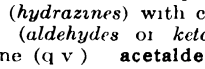
hydrazone (1) A condensation product containing the trivalent —NH N C— group,



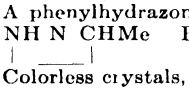
resulting from the action of compounds containing —N NH_2 (*hydrazines*) with compounds containing - CO (*aldehydes* or *ketones*) (*2*) A phenylhydrazone (q v) **acetaldehyde-** PhNH N CHMe Ethidenephenylhydrazine



Colorless crystals, m 64 **diacetyl-**



Colorless crystals m 133 **diphenyl-** Osazone **monoacetyl-** PhNH N CHCOMe Colorless



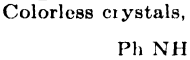
crystals, m 148

hydrazonic acid A compound of the general type R C(OH) N NH metameric with amidoximes and tautomeric with acethydrazides

hydrazonium Hydrazinium

hydrazono The bivalent radical =N NH from hydrazine Cf *hydrazido*

hydrazyl A free radical of the type R_2N N \< derived from the hydrazino group The nitrogen atom bound to the acyl radical is designated as alpha-, and that with the hydrocarbon radical as beta as α-benzoyl-β-diphenylhydrazyl, Ph N NOCPh



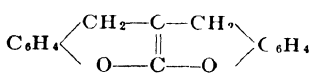
hydride A compound of hydrogen with (a) a more positive element, as sodium hydride NaH, or (b) a member of the phosphorus group (c) A radical, RH, as, methylhydride (methane) **antimony-** Stibine **arsenic-** Arsine **phosphorus-** Phosphine

hydrin The hydrogen acid ester of a polyatomic alcohol as, glycol, glycerol They are of the type HO—R—X, as HO CH_2 CH Cl, glycolchlorohydrin, or HO CH_2 CHOH CH_2Cl, glycerol α-monochlorohydrin

hydrindene C_9H_{10} = 118 1 Indan

hydrindic acid $C_9H_9O_3N$ = 167 1 o-aminomandelic acid $C_6H_4(NH_2)CHOH$ COOH Colorless crystals

hydrindochroman The tetracyclic compound



hydrindone Indone

hydrine Hydrin

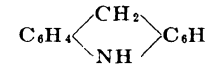
hydriodic acid HI = 127 9 A 57 % solution of hydrogen iodide in water, d 1 700 Used as a reagent for detecting nitrites, determining methoxyl, and as a general reducing agent

hydriodide A compound (usually an alkaloid) combined with hydrogen iodide

hydrion (1) Hydrogen ion (2) A proton, or the positive nucleus of an atom (Soddy)

hydro- (1) A prefix derived from Greek indicating "water" or "hydrogen " (2) Abbreviation for hydroextractor

hydroacridine $C_{13}H_{11}N$ = 181 16 The heterocyclic compound



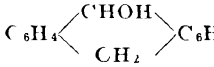
Colorless crystals m 169 insoluble in water, soluble in hot alcohol or ether

hydroalium An aluminum alloy resistant to alkalis containing 7–9 % Mg and 0 2–0 6 % silicon and manganese

hydroangelic acid α-Methyl butyric acid

hydroanthracene Dihydroanthracene

hydroanthranol $C_{14}H_{12}O$ = 196 1 Hydranthranol



Colorless needles, m 76 soluble in hot water, alcohol or ether Cf *oxanthrol*

hydroatropic acid $C_9H_{10}O$ = 150 1 α-phenylpropionic acid, hydratropic acid, α-methyl-α-toluic acid MeCHPhCOOH A colorless liquid b 264 slightly soluble in water, an isomer of hydrocinnamic acid

hydrobenzamide $C_{21}H_{18}N_2$ = 298 2 Tribenzaldiamine tribenzilidendiamine Colorless prisms m 101 insoluble in water, soluble in alcohol or ether

hydrobenzoin $C_{14}H_{14}O_2$ = 214 2 Benzylene glycol diphenyl dihydroxyethane PhCHOH - CHOHPh Colorless leaflets m 136 b 300, slightly soluble in water soluble in alcohol or ether

hydroberberine $C_{20}H_{21}NO_4$ = 339 17 White crystals, m 167 insoluble in water

hydrobilirubin Urobilin

hydroboron See *boron hydrides*

hydrobromic acid HBr = 80 9 A 40 % solution of hydrogen bromide in water A colorless liquid d 1 38 used as a reagent

hydrobromide Hydrogen-bromide An organic salt of hydrobromic acid and an alkaloid Cf *bromide*

hydrocaffeic acid See *caffeic acid*

hydrocarbobase See *base*

hydrocarbon A compound consisting of carbon and hydrogen The number of hydrocarbons is very large, and they are classified into several series, q v **aliphatic-** A compound in which the principal molecules are carbon atoms arranged in chains **aromatic-** A compound in which the principal molecules are carbon atoms arranged in a ring **cyclic-** Aromatic **normal-** A h without side-chains **saturated-** A hydrocarbon in which all four valencies of the carbon atom are satisfied **unsaturated-** A hydrocarbon in which there is one or more double or triple bonds between the carbon atoms

h black Lampblack **h burner** An oil stove in which vaporized kerosene is used as fuel **h radical** A group of atoms of C and H with one or more free bonds Cf *organic radicals, structure symbols* **h series** One of the groups of hydrocarbons in which the

compounds are arranged as homologs, which generally differ by CH_2 Cf *hydronitrogen* The general formulas of some series, and of some of their members are

C_nH_{2n+2}—ALKANES paraffins or methane series (for members of this series see *methane* series)

C_nH_{2n}—ALKENES, olefines, or ethylene series (see *ethylene* series, *cyclo-paraffins*)

C_nH_{2n-2}—ALKINES, acetylenes or ethine series (see *acetylene series, cyclo-olefines, diolefines*)

C_nH_{2n-4}—ALKONES or terpenes
C_4H_4 butone, vinylacetylene
C_5H_6 pentone, valylene
C_6H_8 hexone diallylene
$C_{10}H_{16}$ decone or terpenes, q v , as camphene, citrene dipentene, pinene, sylvestrene, terpinene
$C_{18}H_{32}$ octodecone fichtelite

C_nH_{2n-6}—BENZENES and diacetylenes
C_4H diacetylene q v
C_6H_6 benzene (see *benzene* series), dipropargyl
$C_{15}H_{24}$ sesquiterpenes q v , as calamene, cadmene, cedrene, etc

C_nH_{2n-8} Phenylene series
C_6H_4 phenylene
C_8H_8 cinnamene, styrolene
C_9H_{10} allylbenzene, phenylpropene
$C_{10}H_{12}$ butylenebenzene, phenylbutene and tetrahydro naphthalene

C_nH_{2n-10} Indene series
C_8H_6 ethinylbenzene, acetylenebenzene
C_9H_8 indene
$C_{10}H_{10}$ dihydronaphthalene phenylcrotonylene
$C_{26}H_{42}$ cholesterene
$C_{30}H_{50}$ squalene

C_nH_{2n-12} Naphthalene series
$C_{10}H_8$ naphthalene
$C_{11}H_{10}$ methylnaphthalene
$C_{12}H_{12}$ ethylnaphthalene
$C_{14}H_{16}$ hexahydroanthracene

C_nH_{2n-14} Diphenyl series
$C_{12}H_{10}$ diphenyl and acenaphthene
$C_{13}H_{12}$ diphenylmethane
$C_{14}H_{14}$ diphenylethane dibenzyl, ditolyl
$C_{15}H_{16}$ diphenylpropane benzylethylbenzene benzylxylene

C_nH_{2n-16} Stilbene series
$C_{13}H_{10}$ fluorene
$C_{14}H_{12}$ stilbene, diphenylethene, dihydroanthracene
$C_{15}H_{14}$ diphenylpropene
$C_{16}H_{16}$ diphenylbutene, hexahydropyrene

C_nH_{2n-18} Anthracene series
$C_{14}H_{10}$ anthracene, phenanthrene, tolane, diphenylethine, dimethylanthracene
$C_{15}H_{12}$ methylanthracene
$C_{16}H_{14}$ dimethylanthracene, ethylanthracene, distyrene
$C_{17}H_{16}$ trimethylanthracene
$C_{18}H_{18}$ tetramethylanthracene or retene

C_nH_{2n-20}
$C_{15}H_{10}$ fluoranthene
$C_{17}H_{14}$ naphthylphenylmethane, benzylnaphthene

C_nH_{2n-22}
$C_{16}H_{10}$ pyrene, diphenyldiethine, diacetenylbenzene
$C_{18}H_{14}$ diphenylbenzene
$C_{19}H_{16}$ triphenylmethane
$C_{64}H_{106}$ illipene

C_nH_{2n-24}
$C_{18}H_{12}$ chrysene

C_nH_{2n-26}
$C_{20}H_{14}$ dinaphthyl phenylanthracene
$C_{21}H_{16}$ dinaphthylmethane

C_nH_{2n-28}
$C_{20}H_{12}$ perylene

C_nH_{2n-30}
$C_{22}H_{14}$ idrialene picene pentacene
$C_{23}H_{16}$ methylidrialene
$C_{24}H_{18}$ triphenylbenzene
$C_{25}H_{20}$ tetraphenylmethane

C_nH_{2n-32}
$C_{24}H_{16}$ crackene
$C_{26}H_{20}$ tetraphenylethylene
$C_{27}H_{22}$ tetraphenylpropene

C_nH_{2n-36}
$C_{26}H_{16}$ anthanthrene

C_nH_{2n-38}
$C_{25}H_{14}$ rubicene
$C_{28}H_{18}$ dianthryl
$C_{30}H_{22}$ tetraphenyl benzene

C_nH_{2n-54}
$C_{42}H_{30}$ hexaphenylhexadiine

hydrocarbostyril C_9H_9ON = 147 2 Colorless prisms m 163, slightly soluble in water, soluble in alcohol or ether

hydrocarpic Misnomer for hydnocarpic

hydrocellulose $C_{12}H_{22}O_{11}$ = 342 2 A compound obtained from cellulose by prolonged treatment with concentrated acids

hydrocerulignone $C_{16}H_{18}O_4$ = 274 22 A solid m 190, soluble in alcohol ether or water

hydrochelidonic acid $C_7H_{10}O$ = 174 12 Acetone diacetic acid, 4-ketopimelic acid, 4-oxoheptanedioic acid*, $CO(CH_2CH_2COOH)_2$ A crystalline solid m 142, soluble in alcohol slightly soluble in water or ether

hydrochinone Hydroquinone

hydrochlorate An incorrect term for hydrochlorides

hydrochloric acid HCl = 36 5 Muriatic acid A solution of hydrogen chloride gas in water **conc -** Not less than 35 % HCl A clear colorless fuming liquid, d 1 18, used extensively as a reagent and in organic synthesis **dilute-** A solution of about 20 % HCl **fuming-** A solution of about 37 % HCl, d 1 19 **nitro-** Aqua regia

hydrochloride (Cf *hydrochlorate, chlorhydrate*) A salt of hydrochloric acid and an organic base, especially an alkaloid, it differs from chlorides in retaining the hydrogen atom, as *Alk* HCl Such a salt is usually more soluble than the base

hydrocinnamide $C_9H_{11}ON$ = 149 09 α-benzylacetamide $PhCH_2CH_2CONH_2$

hydrocinnamic acid $C_9H_{10}O_2$ = 150 1 β-phenylpropionic acid Colorless needles, d - 1 071, m 49, b 280, slightly soluble in water, soluble in alcohol or ether **amino-** Phenylalanine **aminohydroxy-** Tyrosine **hydroxy-**, (*alpha-*) Phenyllactic acid (*ortho-*) Melilotic

acid (*para-*) Phloretic acid **methylene-** Benzylacrylic acid

hydrocinnamic aldehyde $C_9H_{10}O_3$ = 134 1 β-phenylpropionic aldehyde A colorless liquid, b 208, insoluble in water, soluble in alcohol or ether Used in organic synthesis

hydrocollidine A ptomaine from putrefying fish

hydrocoridine $C_{10}H_{17}N$ = 151 2 A ptomaine produced by *Bacillus allii* or *Bacterium album* in agar cultures

hydrocotarnine $C_{12}H_{15}O_3N$ = 221 12 An alkaloid derived from opium Colorless crystals, m 53, insoluble in water, soluble in alcohol or ether, used as a hypnotic

hydrocotoin See *cotoin*

hydrocoumaric acid $C_9H_{10}O_3$ = 166 1 β-phenylpropionic acid **para-** Monoclinic colorless crystals, m 128, soluble in water, alcohol or ether **ortho-** Melilotic acid

hydrocoumarone C_8H_8O = 120 1 A colorless fragrant liquid, b 188

hydrocupreine $C_{19}H_{24}N_2O_2$ = 312 2 An alkaloid from cuprea bark, q v **ethyl-** Optochine **methyl-** Hydroquinine

hydrocyanic acid HCN = 27 06 Prussic acid hydrogen cyanide, formonitrile A colorless gas, very poisonous with an almond odor, d 0 697, m −14, b 25, soluble in water, alcohol or ether Used as a poison gas disinfectant, in metallurgy and mining (Cyanide process), agriculture (insecticide and fumigation) and in organic synthesis Cf *HCN discoids zyklon, cyanogas* **h cyanogen chloride** Softifume A mixture of NaCN and $NaClO_3$, used for fumigation by adding to 50 % HCl solution

hydrocyanide The salt of an organic base with hydrocyanic acid, containing the HCN molecule

hydrodiffusion Diffusion into water

hydrodynamics A branch of physics dealing with the mechanical properties of liquids, especially water

hydrodynamometer An instrument for measuring the velocity of a fluid in motion

hydroextractor Hydro A rapid centrifuge for drying or dehydrating crystals, textiles, etc

hydrofermentation Destructive hydrogenation, *e g* , as applied to hydrocarbons

hydroferricyanic acid Ferricyanic acid

hydrofluogermanic acid Fluogermanic acid

hydrofluoric acid HF = 20 0 Phthoric acid A solution of hydrogen fluoride in water A colorless liquid which must be kept in paraffin rubber or bakelite bottles as it attacks glass Used to etch glass, and as a reagent Its salts are the fluorides

hydrofluoride A salt of hydrogen fluoride and an organic base, usually an alkaloid Cf *fluoride*

hydrofluosilicic acid Fluosilicic acid

hydrofranklinite Chalcophanite

hydrogel A gel produced by the coagulation of a colloid with the inclusion of water, *e g* , coagulated silicic acid

hydrogen (A) **History** H was probably first discovered in the 16th century by Paracelsus and first investigated in 1766 by H Cavendish in connection with the action of acids on metals ("inflammable air") Later he showed that water is produced when this gas burns (Greek ὕδωρ, water and γεννάω, to produce) Liquid and solid H were first prepared by Dewar in 1898 (B) H_2 = 2 0160 The simplest **element,** atomic number 1 Hydrogen gas is a colorless, inflammable **gas,** m −256 5, b −252 5, slightly soluble in water alcohol or ether Used in filling balloons, as fuel in torches for cutting metals welding and melting, the production of synthetic stones or gems, annealing of steel, in the 'lime-light," in the hydrogenation of oils, the cracking of hydrocarbons, and the production of synthetic ammonia (C) H = 1 0080 Hydrogen **atom,** the basis of the valence system, being taken as unity, elements combining directly with hydrogen atoms have a negative valence number *e g* , Cl −1, O −2, N −3, elements replacing hydrogen have a positive valence number, *e g* , Na +1, Ca +2 Al +3 (D) **constants** of hydrogen atom and molecule

mass of atom = $1\ 662 \times 10^{-24}$ gram
radius of molecule = 10^{-8} cm
mean free path of molecules at 760 mm pressure and 0°C = $1\ 6 \times 10^{-5}$ cm /sec
average velocity at 760 mm and 0°C = $1\ 70 \times 10^{-5}$ cm /sec
1 cubic meter weighs 89 87 grams (Regnault value)
1 liter at 760 mm and 0°C weighs 0 08987 gm

(E) **Isotopes** of H are protium, H^1 or H^a, mass 1 00756, deuterium (diplogen) H^2, H^b or D mass 2 0136, tritium H^3 H^c or T mass 3 0221 These form six possible molecules with molecular weights from 2 015 to 6 04 Cf *h molecule* (F) **Compounds** of hydrogen Three types (1) Nonmetallic *e g* SbH_3, PH_3, NH_3, in which hydrogen is the positive part These compounds are usually gaseous and volatile, As_2H_4 and Sb_2H_2 are solids (2) Salts, or hydrides *e g* , NaH, CaH_2 in which the hydrogen is the negative part These are crystalline, transparent substances (3) Metallic (hydrogen alloys), *e g* , PdH_x in which the hydrogen is alloyed with, occluded on or absorbed in the metal For other types of h compounds see

hydrocarbons	C_xH_y
hydronitrogens	N_xH_y
silanes	Si_xH_y
stannanes	Sn_xH_y
boron hydrides	B_xH_y

activated- Atomic- **arseniuretted-** Arsine **atomic-** Hydrogen gas which has been subjected to a strong electromagnetic field, and whose molecules are thought to be torn apart Used in certain blowpipes for obtaining extremely high temperatures **excited-** Hydrogen gas subjected to a high potential at low pressure It is thought that the electrons move in less stable energy levels and on falling back emit the characteristic radiations **heavy-** The h isotope of mass 2, deuterium or diplogen **labelled-** Deuterium **nascent-** Freshly generated H, which is supposed to owe its greater chemical activity to being in the atomic form **ortho-, para-** See *h molecule* **phosporetted-** Phosphine **proto-** See *protohydrogen* **sulfuretted-** Hydrogen sulfide **telluretted-** H telluride **triatomic-** H_3 = 3 02 A modification of h obtained by exposure of H to (1) α-rays, (2) vacuum discharge (3) corona discharge, (4) a glass-tube ozonizer (5) high-frequency Tesla discharge It is very unstable, reduces, S, As, Hg and N, can be condensed by liquid air, and decomposed (to H_2) by Pt, Ni, Co, etc **trivalent-** Misnomer for triatomic

h acid Hydracid An acid containing no oxygen, as HX **h bromide** HBr = 80 9

(1) Hydrobromic acid gas A colorless gas, d $_{(air=1)}$ 2 71, m −87, b −68 7, soluble in water, alcohol, or ether Used as a reagent in organic synthesis, and forms salts the bromides (2) Same as hydrobromide of *bromide* **h calomel cell** An electrolytic cell comprising a hydrogen gas- and calomel-electrode, used for conductivity and pH measurements **h cell** An electrolytic cell in which hydrogen gas electrodes are used **h chloride** HCl = 36 46 (a) Hydrogen chloride gas hydrochloric acid gas A colorless gas, d $_{(air=1)}$ 269, m −112 5, b −83 1, very soluble in water, alcohol or ether The aqueous solution is hydrochloric acid Used as a reagent and in organic synthesis (b) A compound of an organic base (alkaloid) with HCl it is usually more soluble in water than the base **h cyanide** Hydrocyanic acid **h dioxide** Hydrogen peroxide **h electrode** A gas electrode in which action depends on the potential set up between an electrode of finely-divided metal saturated with hydrogen, and the hydrogen ions of the solution in which it is placed It is used in potentiometric and pH measurements, since its potential depends on the pH value of the solution **h equivalent** The number of replaceable H atoms in a molecule of an acid, or the number of replaceable OH groups in the molecule of a base **h fluoride** HF = 20 0 Hydrofluoric acid gas, phthoric acid A colorless poisonous gas d $_{(air=1)}$ 0 713 m −83 5, b 19 4, soluble in water or alcohol, used as an aqueous solution or as gas (liberated from CaF_2 with H_2SO_4) for etching glass **h iodide** HI = 127 9 Hydroiodic acid gas A colorless gas, d $_{(air=1)}$ 4 38, m −51, b 34 soluble in water or alcohol The aqueous solution (hydriodic acid) is used as a reagent and in organic synthesis **h ions** The electrically charged particles consisting of a h nucleus, H^- or H^+ They are present in all acids Cf *hydrogen-ion* **h line** The spectrum lines due to hydrogen, as, H_α, H_β, H_γ, etc Cf *Bohr atom, quantum theory atomic structure* **h molecule** The simplest molecule, consisting of two hydrogen atoms With three isotopes, H, D and T, the following six molecules are possible

HH, DD TT, HD, HT, DT

Of these the simplest, H_2, consists of two types **ortho-** and **para-** which differ slightly in physical properties, as, specific heat, vapor pressure They are explained by the different spins of the two nuclei, which may be

in ortho- ⇄ and in para- ↑↑, ⇉, ↓↓

Hydrogen consists of

	ortho-	para-
At −235°C (liq H)	= 99 7 %	0 3 %
At −140°C (liq air)	= 50 %	50 %
At 20°C (room temp)	= 25 %	75 %

ortho- (symmetrical- or alpha-) has even rotation quantum numbers, 0,2,4 , para (antisymmetrical- or beta-) has odd numbers, 1 3,5 **h nitrate** Nitric acid **h nitride** Ammonia **h overvoltage** The electrical charge needed to liberate hydrogen, $2H \rightarrow H_2$, at a metallic surface forming one of a pair of electrodes in a solution, *e g* ,

Pt	0	Ni	0 29	Sn	0 44
Pd	0	Ag	0 33	Pb	0 45
Al	0 18	Cu	0 33	Tl	0 55
Co	0 23	C	0 34	Mn	0 58
Fe	0 24	Sb	0 38	Hg	0 61
W	0 28	Cr	0 41	Zn	0 70

h oxide Water **h peroxide** H_2O_2 = 34 016 H dioxide oxygen, auricome, perhydrol, peroxide of h A clear colorless liquid with a faint odor of nitric acid, d 1 458, m −2, b 85, soluble in water in all proportions, marketed usually as a 3 or 6 % solution, which are designated according to the number of volumes of oxygen they evolve, viz as "10 volumes" and "20 volumes," respectively (cf *perhydrol*) It is acid to litmus, but neutral in dilute solutions In the solid state it is explosive, in solution it decomposes into water and oxygen, this action is accelerated by alkalis, and retarded by acids It can act as a reducing or oxidizing agent Used as a reagent, disinfectant, antiseptic, antichlor, and for bleaching It occurs in traces in natural waters that are exposed to the sun **h peroxide hydrates** $H_2O_2\,H_2O$ $H_2O\,2H_2O$ They are stable if pure, but otherwise decompose explosively **h peroxide of crystallization** A series of compounds which crystallize with one or more molecules of H_2O_2, analogous to water of crystallization **h persulfide** H_2S_2, H_2S , or $S{-}H_2S_2{-}H_2S_3$ A yellow oily liquid d 1 7 soluble in benzene Decomp by alcohol into sulfur and hydrogen sulfide, and bleaches litmus **h phosphide** Phosphine **h selenide** H_2Se = 81 2 A colorless poisonous gas, m −64, b −42, very soluble in water Aqueous solutions react with metallic salts, similarly to hydrogen sulfide **h sulfate** Sulfuric acid **h sulfide** H_2S = 34 1 Sulfuretted h , hydrosulfuric acid, hepatic gas A colorless gas having the odor of rotten eggs, d $_{(air=1)}$ 1 189, m −85 5, b −61 8, very soluble in water or alcohol Used as a reagent for the precipitation of metals shipped in steel cylinders **h sulfide water** An aqueous solution of H_2S, a colorless liquid of strong characteristic odor, used extensively as a reagent in qualitative analysis, for the purification of chemicals by precipitation of heavy metals and as an antichlorinating agent **h telluride** H_2Te = 129 52 A combustible gas or liquid, m −48 b 9, soluble in water with decomposition **h thermometer** An instrument for measuring temperatures from the pressure exerted by a certain volume of confined H gas

hydrogenate (1) To combine with hydrogen or to introduce H into a molecule, as, the saturation of unsaturated compounds (2) To reduce cf *oxidation*

hydrogenated Treated or saturated with hydrogen, as, an oil which has been solidified by transforming unsaturated into saturated compounds, as, olein to palmitin

hydrogenation The process of combining with hydrogen *E g* , (1) saturation of aliphatic unsaturated compounds with H in the presence of nickel or palladium as catalyst or (2) cracking higher hydrocarbons to gasoline by H under pressure Cf *Sabatier Bergius process* **h apparatus** A heavy copper retort with stirrer, used to transform liquid fats into solid fats by h

HYDROGEN ION CONCENTRATION

	pH	pOH	Hydrogen ion concentration in mols per liter (or n gm H^+ per liter)	Hydroxyl ion concentration in mols per liter (or $10^{-14}/n$ gm OH^- per liter)
Acid reaction	0 00	14 0	1 0 normal	0 000 000,000,000,01 normal
	1 0	13 0	0 1 normal	0 000,000,000,0001 normal
	2 0	12 0	0 01 normal	0 000,000,000,001 normal
	3 0	11 0	0 001 normal	0 000,000,000,01 normal
	4 0	10 0	0 0001 normal	0 000,000,0001 normal
	5 0	9 0	0 000 01 normal	0 000,000,001 normal
	6 0	8 0	0 000 001 normal	0 000,000 01 normal
	6 3	7 7	0 000 0005 normal	0 000 000 02 normal
	6 7	7 3	0 000,0002 normal	0 000 000 05 normal
Neutral	7 0	7 0	0 000 0001 normal	0 000,0001 normal
Alkaline reaction	7 3	6 7	0 000,000 05 normal	0 000 0002 normal
	7 7	6 3	0 000 000 02 normal	0 000 0005 normal
	8 0	6 0	0 000 000 01 normal	0 000,001 normal
	9 0	5 0	0 000 000,001 normal	0 000,01 normal
	10 0	4 0	0 000,000,000,1 normal	0 0001 normal
	11 0	3 0	0 000,000,000,01 normal	0 001 normal
	12 0	2 0	0 000,000,000,001 normal	0 01 normal
	13 0	1 0	0 000,000,000,0001 normal	0 1 normal
	14 0	0 0	0 000,000,000 000 01 normal	1 0 normal

hydrogen-ion H^- or H^+ A constituent present in aqueous solutions of acids consisting of positively charged hydrogen atoms All acids dissociate, more or less into this ion $HCl = H^+ + Cl^-$, and the strength or acid' character of the acid is denoted by the sour taste, change of color of indicator, reaction with metals, etc , according to the extent of this dissociation Cf *hydronium ion* The degree of dissociation varies inversely with the concentration of the acid within certain limits **h i concentration** pH, P_H or p_H Potential of hydrogen "momentary," true, actual or active acidity The amount of H^+ per unit volume (moles per liter, $[H^+]$ or $C_H{}^+$) of an aqueous solution It denotes the true acidity or alkalinity of such solutions, and is expressed by the pH value (potential of hydrogen) which is the concentration of H^+ in terms of the reciprocal logarithm of the number of gram-ions of hydrogen per liter, $p_H = \log_{10} 1/C_H$ Pure water dissociates very slightly, so that in one liter there are one-ten-millionth gram-ion (10^{-7} gm), or in other words

1 gram-ion of hydrogen is in ten million liters (10^7 l) of water, naturally, there is an equal number of OH^- ions Hence,

$$[H_2O] = [H^+] + [OH^-]$$
$$1 \text{ liter} \quad 10^{-7} \text{ gm} \quad 10^{-7} \text{ gm},$$

and

$$pH = pOH = \text{constant}$$
$$7\ 0 + 7\ 0 = 14\ 00$$

Accordingly p_H values from 0 to 7 indicate an acid solution, p_H7 neutrality, and p_H7 to p_H14 an alkaline solution See tables **h i conversion** Owing to the different methods of measurement the h i concentration can be expressed, for 0 1 N-HCl in the following terms

$[sH^+]$ and ps_H2 038, based on the dissociation of HCl = 0 9165 (Sorenson)
$[H^+]$ and p_H2 000, assuming complete dissociation (actual acidity)
$[aH^+]$ and pa_H 2 075, activity coefficient (q v) from e m f measurements

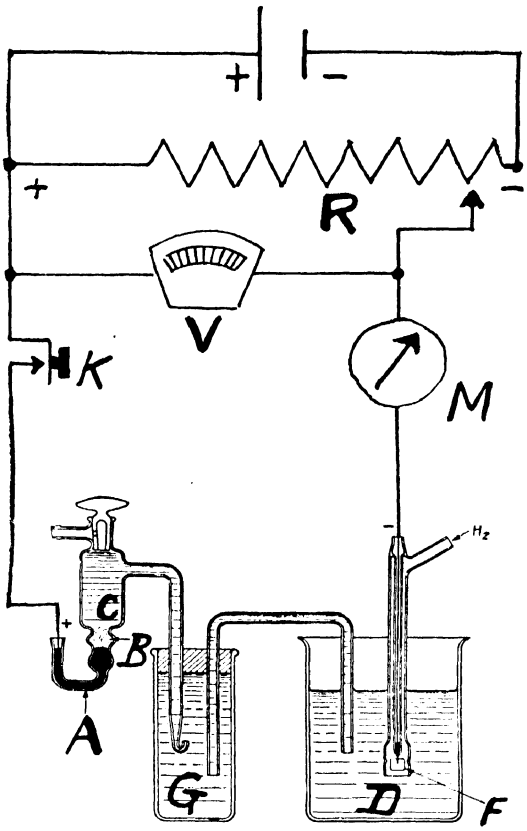
Conversion Table of p_H and C_H

n 00 = 1 00 × 10^{-n}	n 50 = 3 1 × $10^{-(n+1)}$
n 05 = 8 9 × $10^{-(n+1)}$	n 55 = 2 8 × $10^{-(n+1)}$
n 10 = 7 9 × $10^{-(n+1)}$	n 60 = 2 5 × $10^{-(n+1)}$
n 15 = 7 1 × $10^{-(n+1)}$	n 65 = 2 2 × $10^{-(n+1)}$
n 20 = 6 3 × $10^{-(n+1)}$	n 70 = 2 0 × $10^{-(n+1)}$
n 25 = 5 6 × $10^{-(n+1)}$	n 75 = 1 8 × $10^{-(n+1)}$
n 30 = 5 0 × $10^{-(n+1)}$	n 80 = 1 6 × $10^{-(n+1)}$
n 35 = 4 5 × $10^{-(n+1)}$	n 85 = 1 4 × $10^{-(n+1)}$
n 40 = 4 0 × $10^{-(n+1)}$	n 90 = 1 26 × $10^{-(n+1)}$
n 45 = 3 5 × $10^{-(n+1)}$	n 95 = 1 1 × $10^{-(n+1)}$

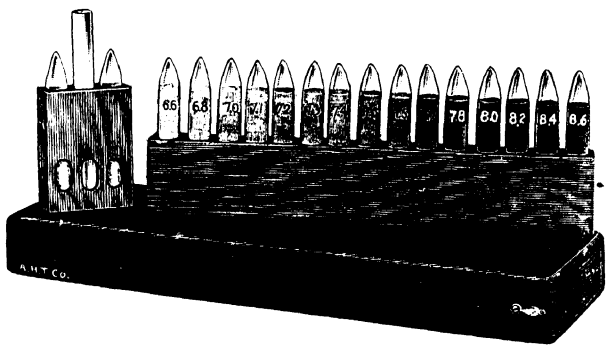
Examples P_H 7 0 equals 1 0 × 10^{-7} gm H^+ per liter p_H 7 5 equals 3 1 × 10^{-8} gm per liter, p_H 5 5 equals 3 1 × 10^{-6} gm per liter

h i determination apparatus A device to measure or determine the p_H value It may be either (a) *electrometric*,—measures the potential of a hydrogen electrode (which depends on the p_H of the solution) against a standard calomel electrode, or, (b) *colorimetric*,—compares the color of an indicator added to the solution with its color in a solution of known p_H See figures **h i indicator** A vegetable or synthetic dye which has definite colors at different p_H values Sec *indicators* **h i recorder** An automatic potentiometer for measuring and recording the acidity and alkalinity of solutions Such devices are used in various industrial processes, and for controlling p_H values

hydrogenite A mixture of 25 % Si, 60 % NaOH, and 15 % slaked lime which ignites on burning to give 270–370 liters of hydrogen gas per kg



(*a*) *Hydrogen-ion determination* (*electrometric*).
A = Calomel electrode consisting of mercury (A), calomel (B) and saturated KCl solution (C).
D = Hydrogen electrode with platinum foil (F) in hydrogen gas and the unknown solution (D).
G = Connecting vessel with salt bridge.
K = Key. V = Voltmeter. R = Rheostat. M = Galvanometer.



(*b*) *Hydrogen ion determination* (*colorimetric*).

hydrogenium. The volatile metallic element of which hydrogen is the supposed vapor; the metallic modification of hydrogen.
hydrogenize. Hydrogenate.
hydrogenolysis. The cleavage of a C—C or C—O bond accompanied by the addition of H_2; as, $R.R' + H_2 \rightarrow RH + R'H$. Cf. *hydrogenation, hydrolysis.*
hydrogenomonas. The first genus of bacteria, occurring in the soil and oxidizing H_2 to form water by catalytically reducing CO_2:

$$CO_2 + H_2 \rightarrow HCHO + O$$
$$HCHO + O_2 \rightarrow H_2O + CO_2.$$

hydrogenylase. An enzyme which promotes liberation of molecular hydrogen.
hydrohaeterolite. The mineral, $2ZnO.2Mn_2O_3.H_2O$.
hydrohalic. Composed of hydrogen and halogens.
hydrohematite. $2Fe_2O_3.H_2O$. A crystalline, hydrated ferric oxide.
hydrohydrastine. $C_{11}H_{13}O_2N$ = 191.1. An alkaloid derived from hydrastine, m.66, soluble in alcohol or ether.
hydrokinetics. The science of the motion of fluids under a force.
hydrol. See *hydrone theory.*
hydrolase. Any enzyme or ferment that causes hydrolysis.
hydrolith. Calcium hydride.
hydrolysis. A decomposition reaction caused by water. In general, a reaction of the type

$$AB + H_2O = AOH + HB,$$

which, in its ionic form, $H_2O = H^+ + OH^-$, is the reverse reaction of neutralization. *Eg.:*

In inorganic chemistry—
$CuSO_4 + H_2O = Cu(OH)_2 + H_2SO_4$
In organic chemistry—
$RCOOR' + H_2O = RCOOH + R'OH$
In biochemistry (by enzymes)—
$R.CONH.R' + H_2O = R.COOH + NH_2R'$
$C_{22}H_{22}O_{11} + H_2O = 2C_6H_{12}O_6$

Cf. *hydrogenolysis.*
hydrolyst. A catalyst causing hydrolysis; as hydrolase.
hydrolyte. A substance which undergoes hydrolysis.
hydrolytic. Pertaining to hydrolysis. **h. condensation.** An erroneous term applied to condensations in which water is eliminated. **h. dissociation.** (1) Ionization. (2) Hydrolysis. **h. enzymes.** See *enzymes* A.
hydrolyze. To produce hydrolysis.
hydromagnesite. A white, chalk-like variety of magnesium carbonate.
hydromechanics. Hydraulics.
hydromel. A fermented (mead) or unfermented mixture of water and honey.
hydrometallurgy. The reduction of ores by leaching (wet processes).
hydrometer. Aerometer. A device for measuring the specific gravity of liquids. It consists usually of a graduated hollow weighted glass tube which sinks in the liquid to a certain depth; this depth read on the scale indicates the density of the liquid. See figure.
Sikes- A hydrometer in which 1 degree equals a mean density-interval of 0.002. **h. scales.** Any one of the conventional graduations on a hydrometer; as, Béaume.

Hydrometer.

HYDROMETER SCALES CONVERSION TABLE

°Tw	°Be	Sp gr	°Tw	°Bé	Sp gr	°Tw	°Bé	Sp gr	°Tw	°Be	Sp gr	°Tw	°Be	Sp gr	°Tw	°Bé	Sp gr
0	0	1 000	29	18 3	1 145	58	32 4	1 290	87	43 8	1 435	116	53 0	1 580	145	60 6	1 725
1	0 7	1 005	30	18 8	1 150	59	32 8	1 295	88	44 1	1 440	117	53 3	1 585	146	60 9	1 730
2	1 4	1 010	31	19 3	1 155	60	33 3	1 300	89	44 4	1 445	118	53 6	1 590	147	61 1	1 735
3	2 1	1 015	32	19 8	1 160	61	33 7	1 305	90	44 8	1 450	119	53 9	1 595	148	61 4	1 740
4	2 7	1 020	33	20 3	1 165	62	34 2	1 310	91	45 1	1 455	120	54 1	1 600	149	61 6	1 745
5	3 4	1 025	34	20 9	1 170	63	34 6	1 315	92	45 4	1 460	121	54 4	1 605	150	61 8	1 750
6	4 1	1 030	35	21 4	1 175	64	35 0	1 320	93	45 8	1 465	122	54 7	1 610	151	62 1	1 755
7	4 7	1 035	36	22 0	1 180	65	35 4	1 325	94	46 1	1 470	123	55 0	1 615	152	62 3	1 760
8	5 4	1 040	37	22 5	1 185	66	35 8	1 330	95	46 4	1 475	124	55 2	1 620	153	62 5	1 765
9	6 0	1 045	38	23 0	1 190	67	36 2	1 335	96	46 8	1 480	125	55 5	1 625	154	62 8	1 770
10	6 7	1 050	39	23 5	1 195	68	36 6	1 340	97	47 1	1 485	126	55 8	1 630	155	63 0	1 775
11	7 4	1 055	40	24 0	1 200	69	37 0	1 345	98	47 4	1 490	127	56 0	1 635	156	63 2	1 780
12	8 0	1 060	41	24 5	1 205	70	37 4	1 350	99	47 8	1 495	128	56 3	1 640	157	63 5	1 785
13	8 7	1 065	42	25 0	1 210	71	37 8	1 355	100	48 1	1 500	129	56 6	1 645	158	63 7	1 790
14	9 4	1 070	43	25 5	1 215	72	38 2	1 360	101	48 4	1 505	130	56 9	1 650	159	64 0	1 795
15	10 0	1 075	44	26 0	1 220	73	38 6	1 365	102	48 7	1 510	131	57 1	1 655	160	64 2	1 800
16	10 6	1 080	45	26 4	1 225	74	39 0	1 370	103	49 0	1 515	132	57 4	1 660	161	64 4	1 805
17	11 2	1 085	46	26 9	1 230	75	39 4	1 375	104	49 4	1 520	133	57 7	1 665	162	64 6	1 810
18	11 9	1 090	47	27 4	1 235	76	39 8	1 380	105	49 7	1 525	134	57 9	1 670	163	64 8	1 815
19	12 4	1 095	48	27 9	1 240	77	40 1	1 385	106	50 0	1 530	135	58 2	1 675	164	65 0	1 820
20	13 0	1 100	49	28 4	1 245	78	40 5	1 390	107	50 3	1 535	136	58 4	1 680	165	65 2	1 825
21	13 6	1 105	50	28 8	1 250	79	40 8	1 395	108	50 6	1 540	137	58 7	1 685	166	65 5	1 830
22	14 2	1 110	51	29 3	1 255	80	41 2	1 400	109	50 9	1 545	138	58 9	1 690	167	65 7	1 835
23	14 9	1 115	52	29 7	1 260	81	41 6	1 405	110	51 2	1 550	139	59 2	1 695	168	65 9	1 840
24	15 4	1 120	53	30 2	1 265	82	42 0	1 410	111	51 5	1 555	140	59 5	1 700	169	66 1	1 845
25	16 0	1 125	54	30 6	1 270	83	42 3	1 415	112	51 8	1 560	141	59 7	1 705	170	66 3	1 850
26	16 5	1 130	55	31 1	1 275	84	42 7	1 420	113	52 1	1 565	142	60 0	1 710	171	66 5	1 855
27	17 1	1 135	56	31 5	1 280	85	43 1	1 425	114	52 4	1 570	143	60 2	1 715	172	66 7	1 865
28	17 7	1 140	57	32 0	1 285	86	43 4	1 430	115	52 7	1 575	144	60 4	1 720	173	67 0	1 860

Twaddle, Beck, Brix Balling and Sikes See conversion table Conversion of °Bé to *D* (density)

$$D = \frac{144\ 3}{144\ 3 - B\acute{e}}$$

°*Tw* to *D* $D = 1 + \frac{Tw}{200} = 1 + 0\ 005T$

°*Brix* to *D* $D = 1 \pm \frac{400}{Brix}$ at 12 5°R

°*Balling* to *D* $D = 1 \pm \frac{200}{Balling}$ at 17 5°C

hydronal Polychloral, viferral A polymerised product of pyridine and chloral, used as a hypnotic

hydronaphthoquinone $C_{10}H_8O_2 = 160\ 1$ **1 2-** Colorless leaflets, m 60, soluble in water **1 4-** Colorless needles, m 175, soluble in water, alcohol or ether

hydrone (1) An alloy of 35 % sodium and 65 % lead, used for making small quantities of hydrogen gas by the action of water (hydrogen cubes) (2) The active molecule H_2O **h theory** Water is a complex mixture of active molecules *hydrone*, H_2O, *hydrol*, H_4O_2, and inactive or associated molecules, *polyhydrones*, $H_{2n}O_n$ Cf *liquids, bonds*

hydronitric acid Hydrazoic acid

hydronitrogen A compound of hydrogen and nitrogen in which the H is generally replaceable by a hydrocarbon radical **h series** A group of homologous compounds differing by NH (Audrieth), many of which exist only as derivatives

Saturated Hydronitrogens

N_nH_{n+2}

NH_3	ammonia
N_2H_4	hydrazine
N_3H_5	triazane
N_4H_6	bihydrazine

Unsaturated Hydronitrogens

N_nH_{2n}

N_2H_2	diimide
N_3H_3	triazene
N_4H_4	tetrazone, buzylene
N_5N_5	hydrazineazide

N_nH_{2n-}

N_3H	hydrazoic acid
N_4H_2	diiminohydrazide
N_5H_3	bisdiazoamine
N_6H_4	bisdiazohydrazine

N_nH_{2n-4}

N_8H_4	octazone

hydronitrous acid Nitroxylic acid

hydronium ion The solvated hydrogen ion, $H^+(H_2O)$ or H_3O^+, which is considered to be present in all acids

$$HCl + H_2O \rightarrow H_3O^+ + Cl^-$$

Cf *protophilia*

hydrophane A transparent variety of opal

hydrophil(e) Lyophile A substance, usually in the colloidal state or an emulsion, which is wetted by water, that is attracts water or water adheres to it

hydrophilic (1) Lyophilic Describing a substance which absorbs or adsorbs water Antonym, hydrophobic (2) Protophilia **h colloid** Finely-divided particles which form

stable suspensions in water Antonym, hydrophobic colloid

hydrophilite Native calcium chloride or chlorocalcite, $CaCl_2$, occurring as white incrustations at Vesuvius

hydrophilous Hygroscopic or hydrophilic

hydrophobe Lyophobe A substance, usually in the colloidal state, which is not wetted by water

hydrophobic Describing a substance which does not absorb or absorb water Antonym, hydrophilic **h colloid** Finely-divided particles which form unstable suspension in water and precipitate readily

hydropirin Sodium acetylsalicylate

hydroponics Tank culture The cultivation of plants in aqueous solutions of inorganic salts free from soil

hydropyrine Lithium acetysalicylate

hydroquinine $C_{20}H_{26}O_2 \cdot 2H_2O$ = 362 3 Methylhydrocupreine A white crystalline powder, used as a quinine substitute in malaria, as a developer in photography and reducer in chemical analysis

hydroquinol $C_6H_6O_2$ = 110 1 Hydrochinone, p-dioxybenzene $C_6H_4(OH)_2$ p-dihydroxyphenol Cf *quinol* Shining white leaflets, m 169 b 285, soluble in water, alcohol or ether, used as an antiseptic, and in photography as a developer **ethyl-** H ethylether **hydroxy-** *1 2 4*-Trihydroxybenzene **tetrachloro-** Chloranol **h carboxylic acid** Gentisic acid **h dimethylether** $C_8H_{10}O_2$ = 138 1 Dimethylhydrochinone p-dimethoxybenzene, $C_6H_4(OMe)_2$ Colorless leaflets, m 55, b 217, insoluble in water soluble in benzene, used as an antiseptic **h ethylether** $C_8H_{10}O_2$ = 138 1 Ethylhydrochinone p-ethoxyphenol 1-oxy-4-ethoxybenzene HOC_6H_4OEt Colorless leaflets, m 66, b 246, soluble in water, alcohol or ether Used as an antiseptic and reducing agent

hydroquinone Hydroquinol

hydroscopic Hygroscopic

hydrosilicon See *silanes*

hydrosilicofluoric acid Fluosilicic acid

hydrosorbic acid Hexenic acid

hydrosol A colloidal suspension in water

hydrosphere The liquid portion of the earth's surface as the oceans lakes rivers etc Cf *lithosphere, atmosphere* Its estimated *composition* is (F W Clarke)

O	85 79 %
H	10 67 %
C	2 07 %
Na	1 14 %
Mg	0 14 %
Ca	0 05 %
S	0 05 %
K	0 04 %
N	0 02 %
Br	0 01 %
C	0 01 %
I	0 006 %
Fe	0 002 %
Remainder	0 002 %

Its *quantity* is distributed as follows (Krummel)

oceans	1330 Million cb km
lakes	0 25 Million cb km
swamps	0 006 Million cb km
rivers	0 02 Million cb km
ground-water	0 25 Million cb km
ice	4 00 Million cb km
atmospheric vapor	0 012 Million cb km

hydrostatics The branch of physics which deals with liquids in equilibrium

hydrosulfate A combination of an organic base usually an alkaloid, with sulfuric acid It differs from a sulfate in that the hydrogen of the acid is not replaced *e g*, *Alk* HSO_4 or *Alk*-hydrosulfate

hydrosulfides Sulfhydrates, sulfhydryls, thioalcohols, thiols, sulfur alcohols, mercaptans (1) A compound containing the monovalent SH^- radical and analogous to hydroxides in that the oxygen is replaced by sulfur (2) An erroneous term for sulfide

hydrosulfite (1) Hyposulfite A salt containing the bivalent—S_2O_4 radical (2) An erroneous term for sodium hyposulfite

hydrosulfuric acid (1) Hydrogen sulfide (2) Dithionic acid

hydrosulfurous acid Hyposulfurous acid

hydrotaxis The motion of organisms or cells (protozoa, etc) towards water

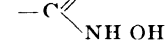
hydrotetrazone An aromatic compound containing four consecutive nitrogen atoms in the molecule *e g*, dibenzaldiphenyldihydrotetrazone, PhCH N NPh NPh N CHPh Cf *tetrazone*

hydrotherapy The treatment of disease by water

hydroumbellic acid *β-2* 4-Dioxyphenylpropionic acid

hydrous Containing water as opposed to anhydrous **h salt** A salt containing water of crystallization

hydroxamic acid An organic compound containing the monovalent



radical, isomeric with hydroximic acid **iso-** Hydroximic acid

hydroxamino The monovalent radical $-NH\,OH$ Cf *hydroxylamine*

hydroxide A compound containing the monovalent hydroxyl OH^- group In general the hydroxides of metals are bases, those of non-metal are acids

MOH	bases
NOH	acids
ROH	alcohols, phenols
RCO OH	organic acids

aryl- Phenols **alkyl-** Alcohols **inorganic-** Bases

hydroxidion Hydroxyl ion The monovalent ion OH^-, possessing alkaline or basic properties

hydroximic acid An organic compound of the type $RC(NOH)OH$, isomeric with hydroxamic acids **acet-** $CH_3C(OH)NOH$ Colorless crystals, m 59 **di-** HON C(OH)—C(OH) NOH

hydroximino Isonitroso

hydroxonium Hydronium

hydroxy Hydroxyl A prefix indicating the presence of the monovalent OH group in an organic compound analogous to acids of the lactic series It is preferable to oxy- **h acetic acid** Glycollic acid **h acetophenone** $C_8H_8O_2$ = 136 10 $C_6H_4(OH)COMe$ *ortho-* A

liquid b $_{10mm}$96–97 *meta-* A solid m 95 *para-* A solid, m 110 **h acetophenone carboxylic acid** Acetyl hydroxybenzoic acid **h acid** An organic compound containing both the hydroxyl and carboxyl radicals, or HO R - COOH *E g*

monobasic, monohydroxy	HO R COOH
dibasic monohydroxy	HO R $(COOH)_2$
monobasic dihydroxy	$(HO)_2$ R COOH

etc See *lactic acid series* **h amides** Oxyamides **h aminobenzoic acid** $C_7H_7NO_3$ = 153 0 Amino salicylic acid $NH_2C_6H_3(OH)$-COOH **3-** or *1 2 3-* Colorless crystals, m 235 **4-** or *1 2 4-* m 220 **5-** or *1 2 5-* m 283, soluble in water, alcohol or ether **h anthraquinone** $C_{14}H_8O_3$ = 224 1 1- or *α-* m 190 2- or *β-* Yellow leaflets, m 302 very slightly soluble in water, soluble in alcohol or ether **h azobenzene** $C_{12}H_{10}ON_2$ = 198 2 (*ortho-*) Colorless needles m 83 slightly soluble in water, soluble in alcohol or ether (*para-*) Colorless prisms m 152, very slightly soluble in water, soluble in alcohol or ether, used in organic synthesis **h benzaldehyde** $C_7H_6O_2$ = 122 2 (*ortho-*) A colorless liquid, d 1 159, m −*20* b 197, slightly soluble in water, soluble in alcohol or ether (*meta-*) Colorless needles m 104 b 240 soluble in water, alcohol or ether (*para-*) Colorless needles, m 116, soluble in alcohol, ether, or water **h benzamide** $C_7H_7O_2N$ = 137 1 (*ortho-*) Yellow leaflets, m 140 decomp 270 soluble in water (*meta-*) Colorless leaflets m 167, soluble in water, alcohol or ether (*para-*) Colorless needles, m 162, soluble in water alcohol or ether **h benzene** Phenol **h benzoic acid** $C_7H_6O_3$ = 138 1 (*ortho-*) Colorless needles m 158 slightly soluble in water soluble in alcohol or ether (*meta-*) Rhombic crystals m 200, slightly soluble in water, soluble in alcohol or ether (*para-*) Colorless monoclinic crystals, d 1 404 m 201, slightly soluble in water soluble in alcohol or ether **h benzylalcohol** $C_7H_8O_2$ = 124 1 (*ortho-*) Saligenin Colorless rhombic crystals, d 1 61, m 85, (sublimes), slightly soluble in water, soluble in alcohol or ether used as an antiseptic (*meta-*) Colorless needles, m 67, slightly soluble in water soluble in alcohol or ether (*para-*) Colorless needles, m 120 soluble in water, alcohol or ether **h butyric acid** $C_4H_8O_3$ = 104 1 (*alpha-*) 1-hydroxybutyric acid Colorless crystals, m 43, decomp 255, soluble in water alcohol or ether (*beta-*) 2-hydroxybutyric acid $CH_3CHOHCH_2COOH$ (*gamma-*) 3-hydroxybutyric acid CH_2OH-$(CH_2)_2COOH$ Acetonic acid **h caffeine** See *caffeine* **h caproic acid** $C_6H_{12}O_3$ = 132 1 (*alpha-*) 1-hydroxycaproic acid 1-oxycaproic acid Colorless crystals, m 60, b 100, slightly soluble in water, alcohol, or ether **h choline** Muscarine **h cinnamic acid** Coumaric acid **h citric acid** $C_6H_8O_8$ = 208 2 A colorless liquid, soluble in water, alcohol or ether, found in sugar beets **h ethylamine** C_2H_7NO = 61 06 $NH_2(CH_2)_2OH$ A colorless liquid, d 1 022, b 171, produced by the putrefaction of kephalin and serin **h formic acid** Carbonic acid **h glutamic acid** $C_5H_9NO_5$ = 163 08 $NH_2(OH)C_3H_4(COOH)_2$ *β-* An amino-acid obtained by extraction of protein hydrolysate in butane **h isobutyric acid** Acetonic acid **h isophthalic acid** $C_8H_6O_5$ = 182 1 (*a-*) 2-hydroxy-1 3-isophthalic acid, 2-hydroxy-1 3-carboxylbenzene Colorless needles m 243, slightly soluble in water soluble in ether or alcohol (*s-*) 5-hydroxy-1 3-isophthalic acid 5-hydroxy-1 3-carboxylbenzene Colorless needles, m 288, slightly soluble in water, soluble in alcohol or ether (*v-*) 4-hydroxy-1 3-isophthalic acid 4-hydroxy-1 3-carboxyl benzene Colorless needles m 305, slightly soluble in water soluble in alcohol or ether **h peucedanin** $C_{16}H_{14}O_5$(?) A lactone, m 142 from *Peucedanum officinale*, and *Imperatoria osthruthium* **h phenyl acetic acid** $C_8H_8O_2$ = 152 06 *p-* $HOC_6H_4CH_2COOH$ An acid, m 148, produced from tyrosine by intestinal putrefaction **h phthalic acid** $C_8H_6O_5$ = 182 1 (*a-*) 4-hydroxy (1 2)phthalic acid, 4-hydroxy-1 3-dicarboxylbenzene Colorless rosettes decomp 181 soluble in water, alcohol or ether, used in organic synthesis (*v-*) 3-hydroxy (1 2) phthalic acid Colorless prisms, decomp on heating, soluble in water, alcohol or ether **h propanone** Acetol **h propionic acid** Lactic acid **h pyridine** Pyridone **h quinol** 1 2 4-Trihydroxybenzene **h quinoline 2-** Carbostyril **4-** Kynurin **8-** C_9H_7NO = 145 03 A precipitant for aluminum, magnesium and zinc **h quinoline carbonic acid** (4-) Kynurenic acid **h succinic acid** Malic acid **h terephthalic acid** $C_8H_6O_5$ = 182 1 2-hydroxy-1 4-terephthalic acid, 2-hydroxy-1 4-dicarboxylbenzene A colorless powder, slightly soluble in water soluble in alcohol or ether **h toluene,** Cresol **h toluic acid** $C_8H_8O_3$ = 152 1 Methyl-hydroxybenzoic acid, methylsalicylic acid cresotic acids Ten possibilities according to the position of

(CH_3)		$(COOH)$		(OH)	
1	-	2	-	3	m 168
1	-	2	-	4	m 172
1	-	2	-	5	m 177
1	-	2	-	6	m 145
1	-	3	-	2	m 163
1	-	3	-	4	m 151
1	-	3	-	5	m 208
1	-	3	-	6	m 172
1	-	4	-	2	m 204
1	-	4	-	3	m 177

They are all colorless needles soluble in alcohol or ether, some are used in organic synthesis **h urea** CH_4O_2N = 76 1 $NH_2CONHOH$ Colorless needles, m 130, soluble in water or alcohol **h valeric acid** $C_5H_{10}O_3$ = 118 1 *alpha-* $MeCH_2CH_2CHOHCOOH$ Colorless needles, m 31, soluble in water alcohol or ether

hydroxyl The monovalent —OH group Its hydrogen can be replaced by positive elements (K, Na etc), while the entire group can be replaced by halogens **h group** The monovalent OH radical **h ion** The monovalent OH^- ion, present in excess in all alkaline or basic solutions, also present in smaller quantities than the hydrogen ion (q v) in all aqueous acid solutions

hydroxylamine NH_2OH = 33 1 Oxyammonia Colorless crystals, decomp 130 (explosive), m 33, b 70, soluble in water alcohol, or ether Used as a reducing agent, and in the manufacture of synthetics **amino-nitroso-phenyl-** Cupferron **di-** The hypothetical compound HO - NH OH **h hydrochloride** HCl NH_2OH = 69 6 Colorless crystals, soluble in water, used

as reducing agent, for the detection of acetone, sulfonic acids etc

hydroxylamines A group of organic compounds containing the monovalent NH_2O— group (alpha-hydroxylamines), or the monovalent —NHOH group (beta-hydroxylamines), *e g*,

NH_2OMe—*α*-methylhydroxylamine, methoxylamine, or methoxyamine*

$NHMeOH$—*β*-methylhydroxylamine* or methylhydroxylamine*

NH_2OEt—*α*-ethylhydroxylamine, ethoxylamine, or ethoxyamine*

$NHEtOH$—*β*-ethylhydroxylamine or ethylhydroxylamine*

alpha- An organic compound derived from hydroxylamine by substituting the hydroxyl hydrogen by an aryl or alkyl radical NH_2OAr (aroxyl amine) or NH_2OAk (alkoxyl amine)

beta- An organic compound derived from hydroxylamine by substituting the hydrogen of the amino group by an alkyl or aryl radical NHR—OH **nitroso-** See *nitrosohydroxylamines*

h hydrochloride $NH_2OH\ HCl$ = 69 5 Oxammonium hydrochloride, hydroxylamine chlorhydrate Colorless crystals, m 151, decomp above this temperature, soluble in water or alcohol Used as a reagent in determining gold, silver, copper acetone, glucose or colchicine, in organic synthesis, as a reducing agent (developer), and in medicine, as an antiseptic

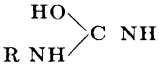
h hydrosulfate $(HN_2OH)_2H_2SO_4$ = 164 2 Hydroxylamine sulfate, oxammonium sulfate, hydroxylaminsulfate Colorless crystals, m - 140, soluble in water, alcohol, or ether, used in organic synthesis, as a reagent and reducing agent

hydroxylamino The monovalent radical —NH - OH, amidoxyl, derived from hydroxylamine

hydroxylammonium See *quaternary amines*

hydroxylation An oxidation as opposed to a hydrolytic reaction, by which one or more hydroxy-groups are formed within an organic molecule

hydroxylimide An organic compound of the type



metameric with amidoximes Cf *isomery*

hydroxynaphthalene Naphthol

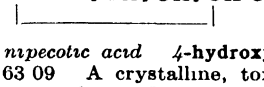
hydroxyphenyl A prefix indicating the monovalent HOC_6H_4—group

hydrozincite $ZnCO_3\ 2Zn(OH)_2$ Zincbloom A native hydroxide and carbonate of zinc occurring in massive or fibrous incrustations in zinc mines

hyenanchin $C_{15}H_{18}O_7$ = 310 14 A crystalline extremely poisonous principle from the seeds of *Hyaenanche globosa* (*Toxicodendron capense*) hyena poison, boesmansgif, an Euphorbiaceae of South Africa, decomp 234 **iso-** Decomp 299

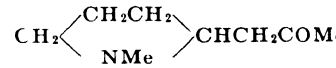
hyenic acid $C_{25}H_{50}O_2$ = 382 5 Tricosylacetic acid The saturate fatty acid $Me(CH_2)_{23}COOH$ A solid, m 78

hygric acid $C_6H_{11}O_2N$ = 129 09

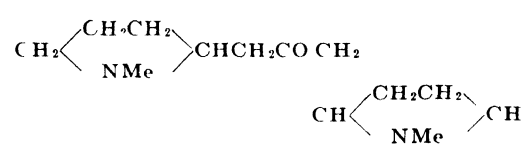


Cf *nipecotic acid* **4-hydroxy-** $C_6H_{11}O_3N\ H_2O$ = 163 09 A crystalline, toxic principle from *Croton goubuga*, Transvaal croton bark, an Euphorbiaceae of South Africa

hygrine $C_8H_{15}ON$ = 141 2 An alkaloid from coca leaves,



A liquid, d 0 935 b 195 **cusco-** $C_{13}H_{24}O\backslash$ = 226 19 An alkaloid, b_{23mm}170, from coca leaves,



hygrol Colloidal mercury

hygrometer A device for measuring the amount of moisture in the atmosphere See also *psychrometer* **chemical-** A hygroscopic mixture of chemicals which indicate the atmospheric moisture by a change of color (cobalt salts) or the formation of crystalline precipitate (camphor solutions) **physical-** A dry- and wet-bulb thermometer The difference between their readings indicates the humidity by reference to tables **whirling-** A physical h which is attached to a handle in such a way that it may be whirled round rapidly, thereby producing rapid circulation of air around the thermometer bulbs

hygrometric Pertaining to humidity **h paper** A filter paper impregnated with a solution of 4 pts $CoCl_2$, 2 pts NaCl 1 pt acacia, 11 pts H_2O, and 1 pt glycerin The amount of moisture is indicated by colors ranging from red (moist) to blue (dry) **h scale** An erroneous term for hydrometric scale **h state** Humidity

hygrometry The measurement of the humidity or moisture of the atmosphere

hygroscopic Becoming moist, as a substance which absorbs water from the atmosphere *e g*, $CaCl_2$ or PCl_5 See *desiccants*, *deliquescence*, *hydrophilic*

hygroscopy Hygrometry

hygrosterol A dextrorotary phytosterol from the roots of *Hygrophylla spinosa* m 194

hylergography The study of the influence of foreign matter on the working of living cells

hylogenesis The theory of the formation of matter ($\upsilon\lambda\eta$ = hyle, greek for matter)

hylon The positive nucleus of the atom

hylotropic A substance which can undergo a change in phase (*e g*, be melted or distilled), without a change of composition

hylotropy The property of a substance of having a constant melting or boiling point Cf *azeotropy*

hymolal salts The salts of sulfuric esters of monohydric alcohols of high molecular weight *e g*, sodium lauryl sulfate, $CH_3(CH_2)_{10}CH_2O - SO_3Na$, used as detergents

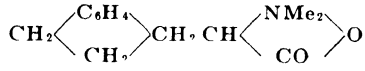
hyoscine $C_{17}H_{21}O_4N$ = 303 17 Scopolamine An alkaloid obtained from several Solanaceae A thick nearly colorless syrup soluble in alcohol, ether or chloroform, and optically-active (*levorotatory*) Its salts are used as hypnotics Cf *scopoline*, *scopomannite* **inactive-** Atroscine **h hydrobromide** $C_{17}H_{21}O_4N\ HBr\ 3H_2O$ = 438 2 Atropin The tropic ester of scopine Scopolamine hydrobromide Colorless crystals, m 194, (anhydrous), soluble in water, or alcohol, used as a hypnotic (twilight sleep) **h hydro-**

chloride $C_{17}H_{21}O_4N$ HCl $2H_2O$ Scopolamine hydrochloride Colorless crystals, m 200, soluble in water or alcohol, used as a hypnotic, anodyne and antispasmodic **h hydroiodide** $C_{17}H_{21}O_4N$ HI = 417 13 Scopolamine hydroiodide Colorless prisms, soluble in water or alcohol **h hydrosulfate** $(C_{17}H_{21}O_4N)_2$ H_2SO_4 = 676 49 Scopolamine sulfate Colorless crystals, soluble in water or alcohol **h sulfate** Hyoscine hydrosulfate

hyoscyamine $C_{17}H_{23}O_3N$ = 289 3 Daturine An alkaloid from *Hyoscyamus niger* and other solanaceous plants, isomeric with atropine Colorless fibrous needles, m 107, slightly soluble in water, soluble in alcohol or ether, used as a hypnotic, sedative and antispasmodic **h bromide** H hydrobromide **h chloride** H hydrochloride **h hydrobromide** $C_{17}H_{23}O_3N$ HBr = 370 2 Colorless prisms, m 152, soluble in water or alcohol, used as a hypnotic **h hydrochloride** $C_{17}H_{23}O_3N$ HCl = 325 7 Colorless crystals, soluble in water or alcohol, used as a hypnotic **h hydroiodide** $C_{17}H_{23}O_3N$ HI = 417 3 Colorless crystals, soluble in water or alcohol, used as a hypnotic **h hydrosulfate** $(C_{17}H_{23}O_3N)_2$ H_2SO_4 = 676 6 H sulfate Colorless crystals, m 199, soluble in water alcohol or ether **h salicylate** $C_{17}H_{23}O_3N$ $C_7H_6O_3$ = 427 3 Colorless crystals soluble in water or alcohol, used as a hypnotic **h sulfate** H hydrosulfate

hyoscyamus Henbane, poison tobacco, hog bane The dried leaves and tops of *H niger*, a solanaceous plant, which should contain not less than 0 065 % alkaloids (hyoscine, hyoscyamine, etc), used as a sedative, analgesic, and antispasmodic

hypaphorine $C_{13}H_{17}O_2N$ = 203 15 Trimethyl tryptophane



An alkaloid from the seeds and bark of *Hypaphorus subrumbrans* a solanaceous plant Colorless crystals soluble in water

hyper- A prefix from the Greek, indicating an excess or more *e g* , hyperoxide or peroxide

hyperchromic Describing a radical which causes an increase in the colour intensity of a coloring material see *hypsochrome*

hyperol Ortizon

hypersthene $(FeMg)O,SiO_2$ A brown or green ferruginous orthorhombic, pyroxene mineral It resembles enstatite

hypertensin Renin

hypertonic Describing a solution having a higher osmotic pressure than blood or another solution with which it is compared (as opposed to isotonic and hypotonic)

hypnacetine $C_{16}H_{15}O_3N$ = 269 2 Hypnoacetine PhCO $CH_2OC_6H_4NHCOMe$ Colorless crystals, m 160, slightly soluble in water, alcohol or ether, used as an antiseptic and hypnotic

hypnal $C_{13}H_{13}O_2N_2Cl_3$ = 335 5 Chloralhydrateantipyrine, monochloralantipyrine, chloralantipyrine Colorless crystals, m 67, soluble in water, alcohol or ether, used as a hypnotic, antipyretic and analgesic

hypnoacetine Hypnacetine

hypnone Acetophenone

hypnotic An agent which produces sleep, *e g* chloral, paraldehyde, bromides, sulfonal, semnal Cf *soporific, somnifacient*

hypo- (1) A prefix from the Greek, indicating below or under (2) Common name for sodium hyposulfite, used as a photographic fixing agent

hypoborate A compound of the type MH_3BO, which is readily decomposed and a strong reducing agent

hypobromite A compound derived from hypobromous acid containing the monovalent—BrO radical **h nitrogen** The nitrogen which can be liberated from organic compounds by hypobromites

hypobromous acid HBrO = 96 93 An unstable compound of monovalent bromine, b 40 (in vacuo)

hypochlorite (1) A compound containing the monovalent—ClO radical (2) The hypochlorites of sodium potassium, calcium or magnesium used in bleaching

hypochlorous acid HClO = 52 5 An oxyacid of chlorine containing monovalent chlorine, it is readily oxidized to chlorous acid or reduced to free chlorine

hypochlorous ion The monovalent ClO^- ion

hypodermic Beneath the skin, as an injection

hypogaeic acid, hypogæic acid $C_{15}H_{29}COOH$ = 254 3 7-Hexadecenoic acid* A fatty acid in tallow and some oils, notably arachis (peanut) oil Colorless needles m 33, b_{15mm} 236, insoluble in water, soluble in alcohol or ether Cf *physetoleic acid*

hypoiodous acid HIO = 143 9 A hypothetical acid **ammono-** H_2IN = 142 9 A solution of I in liquid NH_3, used as nitridizing agent

hypon A hypothetical noble gas, atomic number 118 assumed to be the radioactive source of stellar energy

hyponitrite A compound containing the monovalent NO— or divalent N_2O_2=radical of the general type MNO or $M_2N_2O_2$ used in synthetic chemistry

hyponitrous acid $H_2N_2O_2$ = 62 2 An oxyacid of monovalent nitrogen, isomeric with HNO, decomp to N_2O, an active reducing and oxidizing agent

hypophamine The hormone of the posterior lobe of the pituitary gland **α-** Oxytocin pitocin The uterus-contracting principle A white powder soluble in water and 150 times as potent as the International Standard powdered Pituitary **β-** Vasopressin, pitressin The blood pressure-raising principle A white stable powder, soluble in water, and 80 times as potent as the International Standard powdered Pituitary

hypophorine $C_{14}H_{18}N_2O_2$ = 246 11 Trimethyltryptophane An amino acid, decomp 255 from the proteins of the seeds of erythrina, it causes tetanus in frogs

hypophosphate A compound containing the trivalent $\equiv PO_2$ radical, or the monovalent acid $—HPO_3$ radical

hypophosphite A salt of hypophosphorus acid, containing the $—H_2PO_2$ radical

hypophosphoric acid H_2PO_3 = 66 05 An oxyacid of monovalent phosphorus m 17 4, decomp on further heating to phosphine and phosphoric acid

hypophosphorous acid A 30 % aqueous solution of HPH_2O_2 or $HP(OH)_2$

hypophysis Desiccated pituitary body The cleaned dried, and powdered posterior lobes of the pituary body of cattle A yellowish or grayish amorphous powder of characteristic odor slightly soluble in water, used as a stimulant and hemostatic

hyposulfate (1) Dithionate (2) Thiosulfate

hyposulfite (1) A compound containing the divalent $=S_2O_4$ radical (2) Hypo or antichlor The sodium thiosulfate used in bleaching and as a photographic fixing bath **h process** A method of extracting silver from roasted ores by leaching with sodium hyposulfite solution and precipitating the silver with sodium sulfide

hyposulfuric acid Dithionic acid

hyposulfurous acid Hyposulphurous acid A term no longer used, but formerly applied incorrectly to dithionous acid It more correctly describes sulfoxylic acid, q v

hypothesis A theory which has not been fully proved by experiment Cf *theory, law*

hypotonic A solution having a lower osmotic pressure than blood, (less than 6 6 atmospheres), as opposed to hypertonic and isotonic

hypovitaminosis Vitaminosis

hypoxanthine $C_5H_4ON_4$ = 136 1 Sarkine, 6-oxypurine, xanthoglobulin *6(1)*-purinone Colorless needles decomp 150, insoluble in water Cf *purines*

hypsochrome A radical which when introduced into a colored compound intensifies the color by shifting it towards the violet Cf *hyperchromic, bathochrome, auxochrome*

hyptolide $C_{18}H_{26}O_8$ = 370 3 The bitter principle of the leaves of *Hyptis pectinata*, a labiataceous plant Colorless needles, soluble in hot water, alcohol or ether

hyraldite A preparation consisting principally of sodium thiosulfate and formaldehyde, used in bleaching

hyrax A synthetic resin used as mounting agent for microscopic work requiring a high refractive index (n 1 75)

hyrgol A colloidal solution of mercury, used in syphilis

hyssop The dried leaves of *Hyssopus officinalis* Used as the fluid extract as an aromatic stimulant, carminative and tonic **wild-** Verbena Cf *ysopol* **hedge-** See *gratiolin* **h oil** A colorless oil distilled from hyssop, d 0 932, soluble in alcohol, ether, or benzene Used in flavoring extracts

hystazarin $C_{14}H_8O_4$ = 240 1 *2* 3-dihydroxyanthraquinone Orange-yellow needles, m 260, soluble in alcohol or ether Used as a dye

hystazine Hystazarin

hysteresis (1) The magnetic lag, or retention of the magnetic state of iron in a changing magnetic field, due to the reluctance of the molecules to rotate freely (2) The retardation of a chemical system in reaching equilibrium

Hytor compressor A rotary pump or blower employing a centrifuged liquid to obtain suction or pressure

hyzone Triatomic hydrogen Cf *ozone*

I

i (1) An abbreviation for inactive (optically inactive = *dl*) (2) An abbreviation for *iso-* (3) The Van't Hoff factor

I The symbol for (1) iodine, (2) moment of inertia (3) ionic strength, (4) electric current, (5) light intensity I^-,I' Symbols for the iodide ion

I A T M International Association for Testing Materials

I C I Imperial Chemical Industries Ltd

I G An abbreviation for "Interessen Gemeinschaft" q v

I P K International Prototype kilogram

I P M International Prototype meter

I R Insoluble residue (in analysis)

I U International unit

I W An abbreviation for isotopic weight

iatrochemistry A 16th century school of medicine based on the principles of Paracelsus

iatrol $C_8H_{11}O_2NI_2$ = 423 2 Oxyiodoethylanilide, $PhNH\ O_2EtOI_2$ A grayish powder insoluble in water, soluble in alcohol or ether, used as an antiseptic

ibit Bismuth oxyiodotannate A gray powder, isoluble in alcohol or ether, used as a bactericide and disinfectant

ibogaine $C_{26}H_{30}O_2N_2$ = 404 26 An alkaloid, m 152, from the roots of *Tabernanthe iboga*, the latter is used as an arrow poison in the Congo and has a narcotic effect

-ic (1) A suffix indicating a higher valency, as compared with -ous Thus ferrous (2) and ferric (3), sulfurous (4) and sulfuric (6) (2) A termination of acids generally Cf *-ate* (the salt)

ice Frozen or solid water A transparent colorless solid, d 0 92, m 0 **dry-** Solid carbon dioxide used as refrigerating packing material **salt-** Frozen brine, m −21 (−6°F) A 2 5 lb eutectic mixture has the same effect as 1 lb solid carbon dioxide (dry ice) **i flowers** Water flowers Negative ice-crystals produced in a slab of ice by exposure to heat rays **i ton** The theoretical number of heat units required to melt one ton of ice at 0°C to water of 0°C For a 2000-pound ton it equals 284 000 B Th U **i water mixture** A mixture of pure water and crushed ice used to maintain a constant temperature of 0°C

Iceland agate An obsidian from Iceland **I moss** Cetraria The dried lichens *Cetraria islandica* which occur as grayish white, brown or reddish plant bodies Cf *cetraric acid, cetrarin, lichen stearic acid, thallochlor* **I spar** A transparent variety of calcite possessing the power of double refraction and used in polariscopes (Nicol prism)

ichthalbin Ichthyol albuminate A fine grayish-white powder, odorless, tasteless, insoluble in water, used as an antiseptic

ichthargan Ichthyol silver, silver sulfoichthyolate A brown powder containing 30 % silver and 15 % sulfur, soluble in water, dilute alcohol, or glycerin, used as an antiseptic and astringent

ichthulin A glycoprotein (q v) from the eggs of the carp

ichthylepidin A protein of fish scales, intermediate between collagen and keratin

ichthyocolla Isinglass

ichthyoform Ichthyolformaldehyde A blackish-brown odorless powder insoluble in water or alcohol, used as an intestinal antiseptic

ichthyol $C_{28}H_{36}S_4O_6(NH_3)_2\ 2H_2O$ = 634 40 Ammonium ichthyolsulfonate, anysin, ammonium ichthyolate A reddish brown to black syrup of characteristic empyreumatic odor and burning taste obtained by distillation of bituminous shale, is soluble in water, partly soluble in alcohol or ether Used as an antiseptic alterative, and astringent **i albuminate** Ichthalbin **i formaldehyde** Ichthyoform **i silver** Ichthyolate **i sulfonic acid** The dibasic acid $C_{28}H_{38}O_6S_3$, derived from ichthyol Cf *sulfoichthyolic acid*

ichthyolate A compound containing the bivalent $=C_{28}H_{36}S_2O_6$ radical

ichthyophthalmite A variety of apophyllite sometimes used as gem

iconoscope Electric eye An instrument in which invisible radiations (*e g*, x-rays ultraviolet rays) are rendered visible by impact against a luminescent screen A cathode-ray tube and a screen consisting of a mosaic of tiny photo-electric cells is used as the source of picture modulation signals in television

icosane Eicosane

icosinene $C_{26}H_{38}$ = 278 4 A liquid hydrocarbon from ozocerite

-id, -ide A suffix indicating (1) a compound derived from a negative or nonmetallic element and usually a binary compound as chloride, sulfide phosphide nitride carbide etc (2) a glyceride

-idene A suffix indicating a bivalent radical with a point of attachment to a single atom thus $R\ CH_2\ CH_2\ R$ and $CH_3\ CH\ R_2$ R-ethyl*ene* R-ethyl*idene*

idioblast A hypothetical unit of the living cell a biophore

idiosyncrasy An abnormal constitutional or personal reaction to the effects of certain substances Cf *allergy*

idite, iditol $C_6H_{14}O_6$ = 182 1 A hexatomic alcohol occurring in the d- and l- form Cf *idonic* and *idosaccharic acids*

-ido A suffix which denotes the substitution of an NH_2 group by an acid residue (*e g* an acetyl group)

idocrase A variety of vesuvianite used as gem

idonic acid $C_6H_{12}O_7$ = 196 1 A monobasic, pentahydroxy acid, derived from idite

idosaccharic acid $C_6H_{10}O_8$ = 210 1 A dibasic, tetrahydroxy acid derived from idite

idose $C_6H_{12}O_6$ = 180 1 Pentahydroxyhexanal A hexose or aldose sugar, isomeric with glucose, osazone m 156

idrialene $C_{22}H_{14}$ = 278 11 A hydrocarbon from asphalt **methyl-** $C_{23}H_{16}$ = 291 11 White solid

idryl Fluoranthene

idoplatinic acid Platinic acid

amid A German trade name for superpolyamide synthetic fibers

igepon A $C_{20}H_{37}O_5SNa$ An ester of sodium isethionate and oleic acid, $C_{17}H_{33}COOCH_2CH_2SO_3Na$ used as detergent **T** A substituted amide of oleic acid, $C_{17}H_{33}CONMe\ CH_2CH_2SO_3Na$ used as detergent

ignatia Saint Ignatius' bean, ignatia bean The dried ripe seeds of *Strychnos ignatia*, a loganiaceous plant It contains 2 % alkaloids, mainly strychnine and brucine **i alkaloids** See *strychnine brucine* **i bean** Ignatia

igneous Plutonic A term applied to rocks formed from a molten state as opposed to sedimentary rocks

ignis A fire

ignite (1) To heat a substance at a high temperature until no more loss in weight occurs (2) To set fire to a reaction mixture with or without a primer

ignition Combustion, burning or setting on fire In analysis (a) the complete oxidation of an organic compound by means of oxygen gas and heat (b) The heating of an inorganic compound until all volatile matter has been driven off (c) Placing a flame directly or indirectly in contact with a reaction mixture until the reaction starts and continues, with or without production of a flame to its completion as a mixture of Al and Fe powder **pre-** See *knock* **i point** Kindling temperature The temperature at which a substance begins to burn It is defined as the temperature at which the rate of gain of heat by a volume of vapor balances the rate of loss of heat, the substance then ignites It usually depends on the fineness of the particles, *e g*, powdered zirconium (0 4–8μ) ignites at 210°C Cf *flash point*

ihlenite A native ferric sulfate, $Fe_2(SO_4)_3 \cdot 12H_2O$

ilang-ilang Ylang-ylang

iletin A brand of insulin

Ilex A genus of shrubs and trees Aquifoliaceae, to which the hollies belong Cf *bird-lime, mate, ilexanthin*

ilexanthin $C_{17}H_{30}O_{11} = 403\ 2$ The yellow coloring matter of *Ilex aquifolium*, (holly), an Aquifoliaceae Yellow needles, m 198, decomp 214 insoluble in cold water or ether soluble in hot water or alcohol

ilicic alcohol $C_{30}H_{50}O = 426\ 5$ α-Amyrin A substance, m 185, b exceeds 300 prepared from *Ilex* species, used as a constituent of bird-lime

ilicin A bitter principle from holly, *Ilex aquifolium*

ilicyl alcohol $C_{22}H_{38}O = 318\ 29$ A waxy solid, m 139, b 360

-ilium A suffix indicating tetravalent oxygen, as pyrylium Cf *-inium*

illicium Star *anise*

illinium Il = 146–147(?) A rare earth metal and element, atomic number 61, discovered in 1926 by B S Hopkins by the fractional crystallizations of samarium and niobium salts It gives the characteristic x-ray spectrum with a line at 5810Å, and was named in honor of Illinois With the exception of elements No 85 and 87 it is the last element which can be discovered, as it completes the series of elements from hydrogen to uranium It is also called 'florentium" by Rolla and Fernandes who claimed priority in its discovery It occurs in minute traces in monazite, gadolinite and xenotime

illinum An acid-resistant alloy of Ni Cr, Co, V Al, Mn Ti B and Si for the construction of acid resistant pumps, calorimetric bombs, et invented by S W Parr

illipé (1) The fat of *Bassia latifolia* or *B longifolia* (2) Borneo tallow This is a misnome See *tallow*

illipene $C_{64}H_{106} = 874\ 7$ An unsaturat hydrocarbon from the unsaponifiable matter illipé

illuminant An agent which produces light, as, candle electric bulb or flame

illuminating gas A gas mixture used for illuminating purposes containing approximate H_2(50 %) C_nH_4(28 %), C_nH_{2n}(4 5 %), CO(2 % N(2 %), O(6 %) Cf *gas, natural gas*

illumination (1) The act of lighting up (2) The quantity of light thrown on an object $I = F/S$ where I is the intensity of illumination F the flux density and S the surface area It is measured in metercandles, foot-candles phot or lux **axial-** Light passing in the direction of the axis of a microscope **dark-ground-** Light passing at right angles to the direction of the axis of a microscope **direct-** Light falling on the object on the stage of a microscope from above without being reflected from the mirror **indirect-** Dark-ground i Cf *ultramicroscope*

illuminator A device for producing light as a lamp for microscopes or other instruments

illuminometer (1) A device for measuring the intensity of light (2) A photometer

ilmenite Menacanite, geikielite, $FeTiO_3$ A native, black iron titanate used as a gem

ilmenium A supposed element, which proved to be a mixture of niobium and tantalum

ilvaite $CaFe_2Fe(OH)(SiO_4)_2$ Yenite A hydrous silicate of iron and calcium sometimes used as a gem

im- A prefix indicating the divalent >NH group

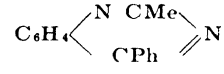
image (1) The likeness or a reproduction of an object (2) The picture of an object formed by rays of light after passing through an optical device **real-** An image formed at the place where the rays of light meet or converge **virtual-** An apparent image, formed in the direction from which the rays enter the eye The rays do not converge at the point where the image is seen, but would do so if produced backwards

image-stone A variety of pyrophillite, sometimes used as gem

imasatic acid Isamic acid

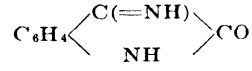
imasatin The lactam of isamic acid, q v

imazine An organic compound containing the trivalent =C N C H N— radical, as in phenmethyl-α-phenylimazine



imbibition The absorption of a liquid by a sol or gel

imesatin $C_8H_6ON_2 = 146\ 1$ β-amino-isatin 3-iminooxindole The heterocyclic compound



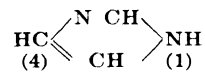
Imhoff sludge A fertilizer made from sewage run into settling tanks, where the solid matter settles with the aid of anaerobic bacteria It contains 2–3 3 % N and 1 % P

imid Imide

imidazimidazole $C_5H_7N_3$ = 109 07 The bicyclic heteroatomic compound

Its isomers have the N in different positions

imidazole $C_3H_4N_2$ = 68 1 1,3-diazole glyoxaline The monocyclic heteroatomic ring compound



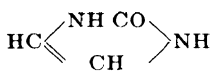
Cf *glyoxaline* *2 4 5*-**triphenyl-** Lophine

imidazoledione Hydantoin

imidazoleethylamine Histamine

imidazoletrione Parabanic acid

imidazolone $C_3H_4ON_2$ = 84 1 Iminazolone The heterocyclic compound

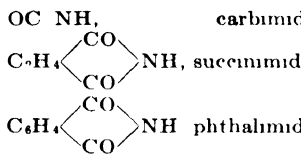


Colorless crystals m −105 Cf *creatinine*

imidazolyl The monovalent radical, C_3H_3N— derived from imidazole There are four isomers

1 **ethylamine** Histamine 1 **mercaptan** $C_3H_3N_2SH$ = 100 2 **meta-** Colorless crystals, m 222

imide (1) A compound containing the divalent >NH group, or a secondary amine, R_2NH, in which R is an acyl radical (2) A compound derived from acid anhydrides in which O is replaced by NH, thus



carbimide

succinimide

phthalimide

acid- A compound of the type R C NH OH Cf *imino bases* **cyclic-** A ring formed by replacing two —OH groups by >NH, as, maleinimide, pyrotartrimide **di-** See *diimide*

1 **chloride** A compound containing the monovalent —C(=NH)Cl radical, formed by the action of HCl on nitriles $R_4C{\equiv}N + HCl \rightarrow R\,C(=NH)\,Cl$

1-**group** Imido

imido The divalent radical, >NH Cf *imino, imide* **acet-** The radical MeC(=NH)— 1 **carbamide** Guanidine 1 **carbonic acid** $(HO)_2C{=}NOH$ 1 **esters** A compound of the type R—C(=NH)OR, obtained as hydrochloride by the action of HCl on a mixture of a nitrile and alcohol

$$CH_3CN + C_2H_5OH + HCl \rightarrow CH_3C(=NH\,HCl)OC_2H_5$$

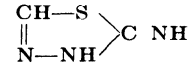
1 **ethers** A group of compounds derived from 1 carbonic acid, of the general type R C(=NOH)OR

1 **hydrogen** The H of the NH-group, which is replaceable by metals, such as Ag, K

imidodiphenyl Carbazole

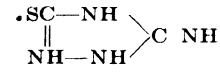
imidogen Imido group

imidothiobiazoline $C_2H_3N_3S$ = 101 2 The heteroatomic ring compound



Colorless crystals 191

imidothiourazole $C_2H_4N_4S$ = 116 2 The heteroatomic ring compound



Colorless crystals, m 222

imidoxanthin Guanine

iminazolone Imidazolone

imineazole Glyoxaline

imino The bivalent =NH group which may be attached to one or two carbon atoms, as =C - NH or —C NH C— 1 **bases** A group of compounds containing the =C NH group, such as guanidine, creatine creatinine, etc 1 **acetic acid** $C_4H_7O_4N$ = 133 1 $NH(CH\,COOH)_2$ Colorless rhombic crystals m 225, soluble in water, insoluble in alcohol or ether 1 **acetonitrile** $C_4H_5N_3$ = 95 1 $NH(CH_2CN)_2$ Colorless leaflets, m 75 soluble in water, alcohol, or ether 1 **ethanol** $C_4H_{11}O_2N$ = 103 1 $NH(CH_2CH_2OH)_2$ = 105 1 Colorless crystals or liquid m 28, b 270 soluble in water alcohol or ether 1 **ethyl alcohol** Iminoethanol 1 **nitrogen** See *ammonia nitrogen* 1 **urea** Guanidine

immersion Submerging in a liquid **oil-** Covering an object and objective of a microscope with oil **water-** Connecting the object and objective of the microscope with a few drops of water

1 **electrode** An electrode which can be lifted from the liquid and immersed at will 1 **objective** See *objective*

immiscible Describing liquids which will not mix with one another 1 **solvent** A liquid which dissolves a substance from a solution with which it does not mix as shaking out" a dissolved substance with ether, chloroform, etc , from an aqueous solution and separating the two liquids See *partition coefficient, distribution coefficient, Perrin equation*

immune Completely resistant to a disease 1 **body** An amboceptor q v 1 **serum** The serum from the blood of an actively-immunized animal, containing the antibodies for a certain disease

immunity The power of resistance of an organism to withstand infection (opposed to susceptibility) **acquired-** I acquired by a previous attack of the disease, or by inoculation with bacterial preparations **active-** I in which the cells of the organism manufacture antibodies, stimulated by bacterial preparations or a slight attack of the disease **natural-** I with which an individual is born **passive-** I in which the cells of the organism do not manufacture the antibodies, and which depends entirely on inoculated immunizing sera **theory of-** See *Ehrlich's side-chain theory*

immunization The process of enabling an organism to withstand the harmful effects of microorganisms, to endure the metabolism products of the invader without injury, and finally to be able to destroy the parasite

immunochemistry The branch of science which deals with the chemical changes and phenomena of immunity Cf *Ehrlich's theory*

immunology The science dealing with immunity

immunotherapy A system of treatment by the action of vaccines

impact A sudden collision **atomic-** The collisions between electrons and protons, as, in the bombardment of a gas with cathode rays Cf *Wilson tracks* **molecular-** The collisions between molecules which are essential for the progress of a reaction It is assumed that without them no chemical change could take place, as molecules must come in contact before their atoms can be exchanged

imperatorin $C_{16}H_{16}O_4$ = 272 2 Peucedanin A tasteless, crystalline principle from masterwort the root of *Imperatoria ostruthium*, an Umbelliferae Colorless prisms, m 98, soluble in alkalis, ether, or warm alcohol Cf *osthruthin* I

imperial jade A green aventurine quartz, used in China as a gem **i yu stone** I jade

imperialine $C_{35}H_{60}O_4N$ = 558 6 A colorless crystalline alkaloid, decomp 254, from *Fritillaria imperialis* a Liliaceae

impermeable Not permitting a passage

impervious Impenetrable, non-absorbent

impinger An apparatus for sampling dust (q v) in air by drawing it at high velocity through a glass tube and letting it strike a wet glass plate, microscopic counts are made on the plate

impregnate To saturate or charge with a gas or liquid

impregnation Saturation with a protective material, as, waterproofing, fireproofing, etc Cf *introfaction*

improver (1) A mixture of starch and salts (as, phosphates chlorides, sulfates of calcium, sodium or ammonium), added to flour to stimulate the yeast and improve the rising properties of the bread (2) Bleaching or whitening agents (as, persulfates iodates bromates, nitrogen chloride, nitrosyl chloride or chlorine), added to flour to remove or mask the color due to carotene

I M S Industrial methylated spirit

in Abbreviation for inch q v **in²** square inch, **in³** cubic inch **in-** A prefix indicating (1) within, (2) not, *e g inorganic* **-in** A suffix indicating (1) a neutral carbohydrate, as, inulin, (2) glucoside, as, amygdalin, (3) protein, as, albumin, (4) a glyceride, as palmitin For alkaloids the suffix *-ine* is customary, as, morphine

In The symbol for indium

inactivate To destroy activity

inactivation Destruction of activity (as of a catalyst or a serum) by chemical or physical means

inactive Describing a compound having an asymmetric carbon atom and yet no optical activity **dissibly-** Able to be resolved into two optically-active substances or racemic compounds **indivisibly-** Unable to be resolved into its optically-active components

Inca stone A pyrite used as a gem

incandescence A state of glowing with intense brilliance

incandescent Emitting heat or light or both by virtue of being at a high temperature **i light** An electric light bulb which producing light by the passage of an electric current through a fine metallic filament, which becomes heated to a bright glow

incendiary An agent that causes combustion Classes a *Spontaneously inflammable solids* such as P, Na, and liquids such as $ZnEt_2$, PH_3, SiH_4, CrO_2Cl_2, P in CS_2 b *Metallic powders*, such as thermite, FeO Al, Mg $KClO_4$ c *Oxidizing combustible mixtures*, such as KNO_3, $Ba(NO_3)_2$, BaO_2, PbO_2 or $KClO_3$ with C, S, Sb, Al or organic compounds d *Flammable material* such as petroleum oils, CS_2

inch A unit of length in the English system 1 in = $1\frac{1}{2}$ foot, $3\frac{1}{6}$ yard, $\frac{1}{63,300}$ mile, $\frac{1}{4}$ of a hand 1 in = 2 54 cm = 25 4 mm = 254,000 Ångstrom Units (= 100 lines = 1000 points) Its fractions and their metrical equivalents are

$\frac{1}{2}$ in	=	12 70 mm
$\frac{1}{4}$ in	=	6 35 mm
$\frac{1}{8}$ in	=	3 175 mm
$\frac{1}{16}$ in	=	1 588 mm
$\frac{1}{32}$ in	=	0 794 mm

cubic- in³ or cu in A unit of volume in the English system 1 in³ = 0 0005787 ft³ = 16 387 cm³ **square-** in² or sq in A unit of area in the English system 1 in² = 0 006944 ft² = 6 452 mm²

inchi grass oil An oil from *Cymbopogon caesius* containing borneol, terpineol, camphene and limonene, used as a substitute for palmarosa oil

incidence The striking contact of one body with another **angle of-** The angle made with the normal by a beam of light striking a surface

incineration Cremation The process of burning to ashes **i dish** A flat dish of alundum, platinum or sillimanite, used for reducing substances to ash in analytical work

incinerator A laboratory furnace for burning refuse, especially that of dissected and infected animals

incipient Beginning **i red heat** Beginning to glow Cf *color scale* (2)

inclination Deviation The angle of an object above the horizon

inclinator A stand in which large bottles or carboys are lodged so that they can easily be tipped for emptying

inclusion A state of being enclosed in or surrounded by a substance, as, enclosed **gas** in a metal, or suspended foreign matter in a crystal Cf *colloids*

incompatibility Inability to be mixed without impairing the original properties **chemical-** Describing substances which, when mixed, react with each other **physical-** The property of repellent substances, as, water and oil **physiologic-** Describing drugs which have a mutually antagonistic effect **therapeutic-** Describing drugs which have opposite therapeutic effects

incompatible Applied to a substance which for chemical, physical or physiological reasons can not be mixed with another without changing its nature or effect

incomplete Not carried to its greatest possible extent **i equilibrium** Equilibrium that has not reached a balanced condition **i purification** A purification process that leaves an impure product **i reaction** Reversible *reaction*

incompressibility Not compressible Ability to resist pressure without change of form or volume

incompressible volume That part of a gas which is not uniformly compressed according to the gas

law the quantity b of van der Waal's equation, q v

inconel A corrosion-resisting alloy of 80 % Ni, 14 % Cr and 6 % Fe

increment The addition to or augmentation of a substance, *e g*, during crystallization or in stalactite formation

incrustation The formation of a crust or scale

incubation The period elapsing between implanting an infection in a culture medium or an organism and its first symptoms or growth

incubator A chamber or box kept at a definite temperature usually 37°C in which bacterial cultures are grown

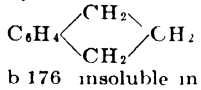
indaconine $C_{27}H_{47}NO_9$ = 529 37 An alkaloid, m 94 from aconite

indaconitine $C_{34}H_{47}NO_{10}$ = 629 37 Acetyl benzoyl-ψ-aconine An alkaloid from aconite, m 202

indamine $C_{12}H_{11}N_3$ = 197 2 Phenylene blue HN C_6H_4 N C_6H_4 NH_2 obtained by the oxidation of p-phenylenediamine and aniline

indamines A group of dyestuffs derived from indoaniline and containing the NH group instead of the quinone oxygen, as in indamine

indan C_9H_{10} = 118 1 Hydrindene 2 3-dihydroindene The bicyclic hydrocarbon



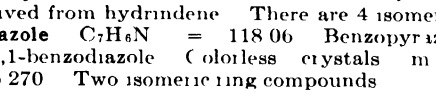
A colorless liquid, d 0 957, b 176 insoluble in water, soluble in alcohol or ether

indandione C_9H_6O = 146 05 Diketohydrindene **1 2-** White crystals, m 107 **1 3-** White crystals, m 130

indanone Indone

indanyl The monovalent radical C_9H_9— derived from hydrindene There are 4 isomers

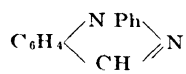
indazole C_7H_6N = 118 06 Benzopyrazole 2,1-benzodiazole Colorless crystals m 146, b 270 Two isomeric ring compounds

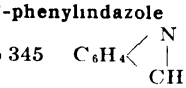
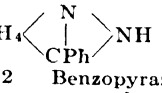


indazole (2 1-) isindazole (1,2-)

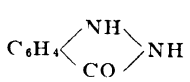
Cf *benzimidazole, benzodiazole*

indazole A compound containing the indazole nucleus, as **α-phenylisindazole** Colorless crystals, m 142

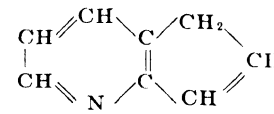


β-phenylindazole Colorless crystals, m 84 b 345  **γ-phenylindazole** Colorless crystals, m 110 

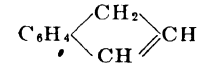
indazolone $C_7H_7ON_2$ = 135 2 Benzopyrazolon The bicyclic heteroatomic compound



indenazin C_8H_7N = 117 1 4-indenazin, 4-isobenzazol, 4-pyriden The heterocyclic compound

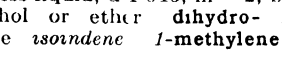


indene C_9H_8 = 116 1 The hydrocarbon



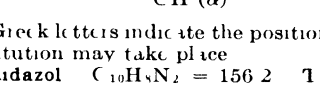
A colorless liquid, d 1 040, m −2, b 188, soluble in alcohol or ether **dihydro-** Hydrindene **iso-** See *isoindene* *1*-**methylene** Benzofulvene

indenes Compounds derived from indene



The Greek letters indicate the positions at which substitution may take place

indenimidazol $C_{10}H_8N_2$ = 156 2 The tricyclic heteroatomic compound



indenone Indone

indenyl The monovalent radical, C_9H_7—, derived from indene, 7 isomers

indeterminable (German unbestimmbar) That which cannot be determined

indeterminate (German unbestimmt) That which cannot be predicted, but which when it happens, can be determined

indeterminism See *Heisenberg's principle*

index [pl **indexes** or **indices**] (1) Mathematical The power to which a quantity is raised (2) Physical Any numerical ratio of measurement in comparison with a fixed standard, as, the i of refraction (3) Bibliographical A classified list as authors subjects formulas, or patent numbers i **catalog** A card catalog containing in alphabetical order the authors and subjects covering the books of a library or the articles of periodicals i **compound** The parent substance under which derivatives are listed

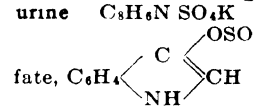
Decennial Index A collective index published at ten-year intervals by (1) Chemical Abstracts of the American Chemical Society and (2) British Chemical and Physiological Abstracts

Indian I agate A moss agate used as a gem **I arrowroot** Euonymus **I balm** Trillium **I balsam** Peru balsam **I barley** Sabadilla **I bel** Bael **I cannabis** Cannabis **I corn** Maize **I fig** Prickly pear **I ginger** Asarum **I gum** (1) Ghatti gum, gummi indicum The exudation of *Anogeissus latifolia*, a tree of India Yellowish-white tears, soluble in water, and used as a mucilage (2) Sterculia gum **I hemp** Cannabis, **I hippo** Gillenia **I laburnum** Cassia **I licorice** Abrus root **I ocher** A native ferric oxide used as war paint by North American Indians **I physic** Gillenia **I pink** Spigelia **I poke** Veratrum **I red** (1) A red ocher from the Island of Ormus in the Persian Gulf, used in early times as a coloring material (2) I ocher **I rubber** Rubber **I saffron** Turmeric **I sage** Eupatorium **I shot** Cannabin **I tobacco** Lobelia I

topaz A saffron-yellow variety of topaz **I turnip** The corm of *Arisaema triphyllum* Used as an expectorant, and diaphoretic as the fluid extract **I yellow** (1) Purree A yellow pigment manufactured in India, containing the magnesium salt of purreic acid (2) Azoflavin (3) Cobalt and potassium nitrite (4) Euxanthone

indian-rubber Rubber

indican (1) $C_{14}H_{17}NO_6$ = 295 14 A glucoside from woad, *Isatis tinctoria*, a Cruciferae, also from indigo, *Indigofera* species, or leguminosaceous plants Colorless leaflets, m 57, hydrolyzing to glucose and indoxyl, soluble in water It is also formed from the indole present in the intestine during putrefaction (2) **I of urine** $C_8H_6N\,SO_4K$ = 251 2 Indoxyl sulfate,



A normal constituent of urine **i meter** A device for estimating the quantity of i in urine **i test** To 5 cc urine add a few drops of Obermayer's reagent (q v), shake, and add chloroform After shaking the chloroform separates with a blue color if i is present

indicarmine Indigo carmine

indicator (1) A solution of a substance which changes in color on the passage from acidity to alkalinity, or the reverse The gradation of color changes is a measure of the pH value (2) A substance which shows the beginning or end of a chemical reaction, as, ferric ammonium sulfate in the titration with KCNS, or starch in iodimetry **achromatic-** A mixture of two i or of an i and dye which produces at the end point a color complementary to that of the i itself at its transition point The mixture thus appears colorless or grey at its end point, *e g*, methyl red (0 125 %) and methylene blue (0 0825 %) **acid-base-** Hydrogen ion- **adsorption-** Substances which indicate the end point of a precipitation reaction by being released from the adsorbed state, as, rhodamine on silver chloride **ammono system-** A substance which indicates the presence of an ammono acid or ammono base in a liquid ammonia solution thus

	Am acid	Am base
Hydrazobenzene	yellow	reddish
Hydrazotoluene	yellow	brown

aquo system- Hydrogen ion- **Clark and Lubs-** A series of phthalein i (q v) covering a pH range from 1 0 to 9 0 See table **compound-** A mixture of indicators, as, universal i **external-** Outside- **fluorescent-** A substance which indicates an endpoint or pH value by a change of fluorescence, as quinine sulfate **hydrogen ion-** A substance which indicates by its color the approximate hydrogen-ion concentration of a solution **inorganic-** Metallic salts used in titrations, as, potassium chromate and ferrocyanide **inside-, internal-** An i added to a liquid to be titrated, as, litmus in neutralisation titrations **one-colour-** An i which changes from colored to colorless *e g*, phenolphthalein **outside-** External- An i to which a drop of the titrated liquid is added on a porcelain plate **oxidation-reduction, redox-** A substance which indicates the state of oxidation by its color, as, compounds of Mn, Cr, Fe etc, or organic compounds At *p*H 7 0 the potentials are

indigo disulfonate	−0 121
indigo trisulfonate	−0 081
indigo tetrasulfonate	−0 046
methylene blue	+0 011
toluylene blue	+0 115
Bindschedler's green	+0 224
o-chlorophenol indophenol	+0 233
m-bromophenol indophenol	+0 248
benzoquinone	+0 30
ferrocyanide	+0 40

phthalein- An important group of synthetic dyes derived from the phthaleins, used as indicators, the following are commonly used

phenolphthalein		60
tetrabromo-		—
phenolsulfonphthalein	Phenol-red	50
dibromo-	Bromphenol-red	43
dichloro-	Chlorphenol-red	41
dibromdichloro-	Bromchlorphenol-blue	29
tetrabromo-	Bromphenol-blue	21
diiodo-		—
nitro-		—
tetranitro-		—
o-cresolphthalein		57
o-cresolsulfonphthalein	Cresol-red	53
dibromo-	Bromcresol-purple	40
m-cresolsulfonphthalein	Cresol-purple	15
tetrabromo-	Bromcresol-green	31
thymolphthalein		61
thymolsulfonphthalein	Thymol-blue 12,	55
dibromo-	Bromthymol-blue	45
nitro-		—
anisolsulfonphthalein		—
naphtholphthalein		52
fluorescein		—
eosin		—

The numbers refer to the classified list of indicators **redox-** Oxidation-reduction **screened-** An i which has been added to another coloring matter (not necessarily an i) to make the color change more readily detectable or sharper Cf *achromatic-* **Sorensen-** A series of synthetic indicators covering the pH range 0 1–13 0 They are numbered consecutively in the classified list in the column marked S **turbidity-** A semicolloid which fluocculates at a certain pH value (iso-electric point) and so indicates when this point has been reached in volumetric analysis **two-color-** An i which changes from one color to another, *e g*, a phthalein i (see table) **universal-** A mixture of indicators covering a wider pH range than each individual i *E g*, a solution of methyl orange 0 1, methyl red 0 4, bromthymol blue 0 4, α-naphtholphthalein 0 32, phenolphthalein 0 5 and cresolphthalein 1 6 gm in 100 cc 70 % alcohol One drop in 10 cc of test solution gives colors as follows

red	3 0	bluish-green	8 5
orange-red	4 0	greenish-blue	9 0
yellow-orange	5 0	blue	10 0
yellow	6 5	violet	11 0
green	8 0	reddish-violet	12 0

vegetable- A coloring matter derived from plants which has different colors in acid and alkaline solutions

SYNTHETIC INDICATORS

(Classified List)

No		Acid	pH	Alkali	S *	C&L**
1	Ethylviolet	yellow	0 0 – 2 0	green		
2	Methylgreen	yellow	0 0 –11 0	green		
3	Fuchsin, basic	yellow	0 0 –12 5	magenta		
4	Methylviolet	yellow	0 5	green	1	
5	Brillantyellow	blue	0 5 – 7 0	yellow		
6	Diphenylaminoazobenzene		1 2 – 2 1		2	
7	Iodine green	yellow	0 5 – 1 5	blue-green		
8	Malachitegreen	yellow	0 5 – 1 5	green		
9	Metanilyellow	red	1 2 – 2 5	yellow	3	
10	Crystalviolet	green	1 5	blue		
11	Erythrosin	orange	1 2 – 2 5	magenta		
12	Thymolblue	pink	1 2 – 2 8	yellow		1
12a	Xylenolblue	pink	1 2 – 2 8	yellow		
13	Methylviolet	green	2 0	blue		
14	Brilliantgreen	yellow	1 0 – 3 0	blue-green		
15	m-Cresolpurple	red	1 5 – 2 5	yellow		
16	Tropeolin OO (Orange IV)	red	1 4 – 2 6	yellow	4	
17	Aminoazobenzene	orange	2 5	yellow		
18	Dinitrophenol	colorless	3 0	yellow		
19	Benzeneazobenzylamine	red	2 3 – 3 5	orange	5	
20	Dimethylaminoazobenzene	magenta	2 9 – 4 0	yellow	6	
21	Bromphenolblue	yellow	3 0 – 4 6	blue		2
22	Congo red	blue	3 0 – 4 6	red		
23	Methylorange	orange	3 1 – 4 4	yellow	7	
24	Benzopurpurin	purple	3 5 – 4 5	scarlet		
25	Methylviolet	blue	4 0	purple		
26	Benzoazo-α-naphthylamine		3 7 – 5 0		8	
27	Ampho-magenta	red	4 0 – 5 0	blue		
28	Naphthylamineazosulfanilic acid		3 5 – 5 7		9	
29	Bromchlorphenolblue	yellow	4 5 – 5 5	blue		
30	Methylred	red	4 4 – 6 0	yellow	10	3
31	Bromcresolgreen	yellow	4 5 – 5 5	blue		
32	Cochineal	orange	5 0 – 6 0	violet		
33	Lacmoid	red	4 4 – 6 4	blue		
34	Propylred	red	4 8 – 6 4	yellow		4
35	Hematoxylon	yellow	5 0 – 6 0	brown		
36	Carminic acid	red	5 0 – 6 0	magenta		
37	Alizarin red	yellow	5 5 – 6 8	magenta		
38	Phenacetolin	brown	5 5 – 6 5	red		
39	p-Nitrophenol	colerless	5 – 7 0	yellow	11	
40	Bromcresolpurple	yellow	5 2 – 6 8	purple		5
41	Chlorphenolred	yellow	5 5 – 6 5	red		
42	Azolitmin	red	5 4 – 7 8	blue	12	
43	Bromphenolred	yellow	6 0 – 7 0	red		
44	Nitrophenolsulfonphthalein	yellow	6 5 – 7 5	purple		
45	Bromthymolblue	yellow	6 0 – 7 6	blue		6
46	Curcumin	yellow	7 4 – 8 6	brown		
47	Aurin	yellow	7 0 – 8 0	magenta		
48	Neutralred	magenta	6 8 – 8 0	orange	13	
49	Nileblue	blue	7 0 – 8 0	magenta		
50	Phenolred	yellow	6 8 – 8 4	red		7
51	Rosolic acid	orange	6 9 – 8 0	yellow	14	
52	α-Naphtholphthalein	pale pink	7 3 – 8 4	green	15	
53	Cresolred	yellow	7 2 – 8 9	red		8
54	Brilliant yellow	yellow	7 5 – 8 5	scarlet		
55	Thymolblue	yellow	8 0 – 9 6	blue		9
56	Bromphenolpurple	colorless	8–12	purple		
57	p-Cresolphthalein	colorless	8 2 – 9 2	red		10
58	Purpurin	orange	8 5 – 9 5	magenta		
59	Tropeolin OOO	orange	7 6 – 8 9	scarlet	16	
60	Phenolphthalein	colorless	8 3 –10 0	magenta	17	
61	Thymolphthalein	colorless	9 3 –10 2	blue	18	
62	Alizarin yellow	yellow	10 1 –12 1	purple	19	
63	Methylblue	blue	10 5 –11 0	red-brown		
63a	Nitramin	colorless	10 8 –13 0	brown		

SYNTHETIC INDICATORS—(*Continued*)

No		Acid	pH	Alkali	S *	C&L**
64	Methylgreen	blue-green	11–12	colorless		
65	Benzopurpurin	violet	11–12	orange		
66	Tropeolin O	yellow	11 1 –12 7	brown	20	
67	Poirrier's blue	blue	11 0 –13 0	red		
68	Alkali blue	blue	12–13	red		
69	Fuchsin, basic	magenta	12–13	colorless		
70	Crystalviolet	purple	12–13	colorless		
71	Alizarin blue	green	12–14	blue		
72	Fuchsin, acid	magenta	12–14	colorless		
73	Trinitrobenzene		13–14			

* Sørensen indicators ** Clark and Lubs indicators

VEGETABLE INDICATORS

Source	Family	Acid	Alkali	Active constituent
Lichens				
Roccella tinctoria (litmus)	Parmeliaceae	red	blue	azolitmin
Parmelia parietina	Parmeliaceae	yellow	violet	parietin
Roots, rhizomes etc				
Alkanna tinctoria	Boraginaceae	red	green	alkannin
Beta vulgaris	Chenopodiaceae	purple	red	
Curcuma long (turmeric)	Zingiberaceae	yellow	brown	curcumin
Perezia adnata	Compositae	yellow	red	pipitzahoin
Raphanus sativus	Cruciferae	red	green	
Woods				
Baphia nitida	Leguminosae	orange	blue	
Pterocarpus santalinus	Leguminosae	red	violet	santalin
Caesalpinia echinata	Leguminosae	yellow	violet	brazilin
Haematoxylon campechianum	Leguminosae	yellow	purple	hematoxylin
Flowers, yellow or white				
Convolvulus species	Convulvulaceae	colorless	yellow	
Geranium species	Geraniaceae	colorless	yellow	
Rose species	Rosaceae	colorless	yellow	
Trifolium repens	Leguminosae	colorless	yellow	
Viola tricolor	Violaceae	colorless	yellow	
Mimosa species	Mimosaceae	colorless	yellow	
Philadelphus coronarius	Saxifragaceae	colorless	yellow	
Flowers, red and blue				
Begonia species	Begoniaceae	red	blue	
Aster species	Compositae	red	bluishgreen	
Dahlia species	Compositae	red	green	
Centaurea cyanus	Compositae	red	blue	cyanidin
Convolvulus arvensis	Convolvulaceae	red	green	
Delphinium species	Ranunculaceae	red	green	delphidin
Dianthus caryophyllus	Caryophyllaceae	red	bluishgreen	
Geranium species	Geraniaceae	red	bluishgreen	pelargonidin
Iris species	Iridaceae	red	green	
Lathyrus species	Leguminosae	red	bluishgreen	
Vicia sativa	Leguminosae	red	green	
Malvae species	Malvaceae	red	green	
Nasturtium species	Cruciferae	orange	green	
Papaver species	Papaveraceae	red	violet	
Portulaca species	Portulacaceae	red	violet	
Phlox drummondi	Polemoniaceae	red	green	
Petunia species	Solanaceae	red	green	
Solanum species	Solanaceae	red	green	
Rose species	Rosaceae	red	green	
Viola tricolor	Violaceae	red	bluishgreen	
Berries and Seeds				
Bixa orellana	Bixaceae	green	yellow	bixin
Morus rubra	Moraceae	red	violet	
Phytolacca decandra	Phytolaccaceae	purple	orange	
Vaccinium myrtillus	Ericaceae	red	blue	myrtillin
Vitis vinifera	Vitaceae	red	blue	enidin

SYNTHETIC INDICATORS

(Alphabetical List)

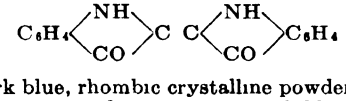
The numbers correspond with the numbers of the following classified list

	No
Alizarin blue	71
Alizarin red	37
Alizarin yellow	62
Alkali blue	68
Aminoazobenzene	17
Ampho-magenta	27
Aurin	47
Azolitmin	42
Benzene-azobenzylaniline	19
Benzene-azonaphthylamine	26
Benzopurpurin	24, 65
Brilliantgreen	14
Brilliantyellow	5, 54
Bromchlorphenolblue	29
Bromocresol-green	31
Bromocresol-purple	40
Bromophenol-blue	21
Bromophenol-purple	56
Bromophenol-red	43
Bromothymol-blue	45
Carminic acid	36
Chlorophenol-red	41
Cochineal	32
Congo red	22
o-Cresolphthalein	57
m-Cresol-purple	15
Cresol-red	53
Crystalviolet	10, 70
Curcumin	46
Dimethylaminoazobenzene	20
Dinitrophenol	18
Diphenylaminoazobenzene	6
Erythrosin	11
Ethylviolet	1
Fuchsin, basic	3, 69
Fuchsin, acid	72
Hematoxylin	35
Iodine green	7
Lacmoid	33
Malachite green	8
Metanil yellow	9
Methylblue	63
Methylgreen	2, 64
Methylorange	23
Methylred	30
Methylviolet	4 13 25
α-Naphtholphthalein	52
α-Naphthylamine-azo-sulfanilic acid	28
Neutral red	48
Nile blue	49
p-Nitrophenol	39
Nitrophenolsulfophthalein	44
Phenacetolin	38
Phenolphthalein	60
Phenol-red	50
Poirrier's blue	67
Propyl-red	34
Purpurin	58
Rosolic acid	51
Thymolblue	12, 55
Thymolphthalein	61
Trinitrobenzene	73
Tropeolin O	66
Tropeolin OO	16
Tropeolin OOO	59
Xylenolblue	12a

1 **exponent** The pH value at which the color change of an i is most rapid Theoretically it is the midpoint of the i range 1 **paper** A paper impregnated with an i and dried See *test paper* 1 **range** The pH values over which the color of an i changes (see tables)

indicolite A blue variety of tourmaline, used as gem

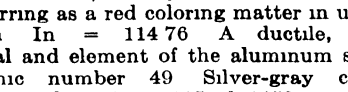
indigo $C_{16}H_{10}O_2N_2$ = 262 2 Indigo-tin, synthetic indigo, $\Delta^{2,2}$-bis-ψ-indoxyl



A dark blue, rhombic crystalline powder, d 1 35, subliming 300, decomp 390, insoluble in water, alcohol, or ether, soluble in hot aniline or hot chloroform Used in dyeing, and as a reagent **Chinese green-** A dye prepared from the bark of *Rhamnus chlorophora*, of China, used in dyeing silk **leuco-** I white **natural-** I blue **soluble-** I white or I carmine

1 **blue** The blue coloring matter obtained by fermentation from various species of *Indigofera* (Leguminosae), used in dyeing and as a constituent of printing inks 1 **carmine** $C_{16}H_8N_2O_2(SO_3Na)_2$ = 466 3 Soluble indigo, sodium indigotinsulfonate, sodium coerulinsulfate, indigo extract A blue powder or paste, soluble in water or alcohol Used as a dye, and clinically in the function test of the kidneys 1 **copper** $CuSO_3$ Covellite A blue native copper sulfite 1 **dicarboxylic acid** $C_{18}H_{10}O_6N_2$ = 350 2 A blue powder, insoluble in water alcohol or ether, soluble in sulfuric acid 1 **disulfonate** An oxidation-reduction and pH indicator changing at 12 5 from blue (acid) to yellow (alkali) 1 **red** Indirubin 1 **extract** I carmine 1 **white** $C_{16}H_{12}O_2N_2$ = 264 2 Biindoxyl, leuco indigo, soluble indigo A colorless powder which is insoluble in water, soluble in alcohol, ether or alkalis, and oxidized to i blue, used in the vat-dyeing of textiles with indigo

indigotin (1) Indigo (2) The heterocyclic compound, diindogen or $\Delta^{2,2}$-bis-ψ-indoxyl Cf *indigo* **iso-** $C_{16}H_{10}O_2N$ = 262 2 Bioxindol



Cf *isatan, isatide*

indin $C_{16}H_{10}O_2N_2$ = 262 18 An isomer of indigo soluble in water, slightly soluble in alcohol or ether **chloro-** Chlorindin

indirubin $C_{16}H_{10}O_2N_2$ = 262 18 Indigo-red, oxindole-$\Delta^{3,2}$-ψ-indoxyl An isomer of indigo, occurring as a red coloring matter in urine

indium In = 114 76 A ductile, trivalent metal and element of the aluminum subgroup, atomic number 49 Silver-gray crystalline masses, d 7 362, m 115, b 1450, insoluble in water, soluble in acids It was discovered in 1863 by Reich and Richter, and named in allusion to the indigo-blue lines of its spectrum It is usually trivalent, but may be di- or monovalent It is at present not used commercially, but it forms low-melting alloys

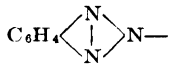
1 **bromide** $InBr_3$ = 354 5 I tribromide A yellow powder, soluble in water 1 **chloride** There are three chlorides InCl, I monochloride $InCl_2$ I dichloride $InCl_3$ I trichloride 1

cyanide $In(CN)_3$ = 192 8 A colorless poisonous powder which is soluble in water **i dichloride** $InCl_2$ = 185 7 A yellow liquid, decomp by water into the trichloride and metallic indium **i hydroxide** $In(OH)_3$ = 165 8 A colorless powder, insoluble in water **i iodide** InI_3 = 495 8 Yellow hygroscopic crystals, soluble in water **i nitrate** $In(NO_3)_3 \cdot 3H_2O$ = 354 9 White crystals, soluble in water **i oxide** In_2O_3 = 277 6 A white or slightly yellow powder, d 7 18, insoluble in water, soluble in acids **i sulfate** $In_2(SO_4)_3$ = 517 6 A white or gray powder, hygroscopic, poisonous and soluble in water **i sulfhydrate** $In(SH)_3$ = 213 8 A yellow powder, precipitated from aqueous indium salt solutions by the action of hydrogen sulfide **i sulfide** In_2S_3 = 325 6 A carmine-red powder, insoluble in water **i trichloride** $InCl_3$ = 221 2 I chloride White, hygroscopic, poisonous crystals, sublime 500, readily soluble in water, and used as an external antiseptic

indoaniline $C_{12}H_{10}N_2O$ = 198 07 *N-p*-aminophenyl quinonimine Colorless crystals

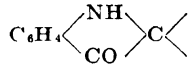
indoanilines A group of compounds derived from indoaniline, q v Cf *indamines*

indodiazole Pseudoazimide A compound which contains the monovalent radical



indoform Salicylic acid methylene-acetate A white powder of acid astringent taste, sparingly soluble in water, used for gout and rheumatism

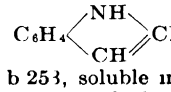
indogen The bivalent radical



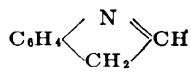
di- *Indigo* **pseudo-** Isatin

indogenide A compound containing the indogen radical

indoldione ψ-Isatin

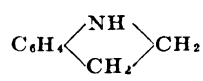
indole C_8H_7N = 117 11 1-benzazole, ketole, benzopyrrole  Colorless leaflets, m 52, b 253, soluble in water, alcohol, or ether It occurs in oil of jasmine, clove oil, and as a product of intestinal putrefaction, and has a peculiar feces-like odor Used as a microchemical reagent for cellulose and in great dilution in perfumery (orange blossoms) Its radical is indyl **dihydro-** Indoline **dihydrodiketo-** Isatin **dihydroketo-** Oxindole **hydroxy-** Indoxyl **iso-** *2*-Benzazole **α-methyl-** C_9H_9N = 130 1 Alpha-methylindole, methylketol Colorless crystals, m 59, soluble in water **β-methyl-** Skatole **n-nitro-** $C_8H_7N_2O_2$ = 163 2 Colorless crystals, m 172 **pseudo-** Indolenine

indolenine C_8H_7N = 117 11 Iso-1-benzazole, ψ-indole



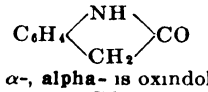
iso- 2-Isobenzazole

indoline C_8H_9N = 119 11 2, 3-dihydroindole

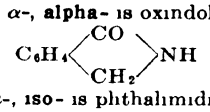


2-keto- Oxindole **3-keto-** ψ-Indoxyl

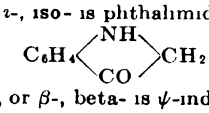
indolinone C_8H_7ON = 133 06 A group of heterocyclic compounds



1-, or **α-**, **alpha-** is oxindole



2-, or **i-**, **iso-** is phthalimidine

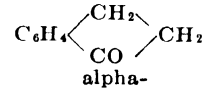


3-, or **β-**, **beta-** is ψ-indoxyl

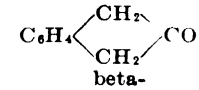
indolol Indoxyl

indolone **1(3)-** Phthalimidine **2(3)-** Oxindole **3(2)-** ψ-Indoxyl Cf *indolinone*

indone C_9H_8O = 132 1 Indanone, hydrindone **alpha-** Rhombic leaflets, d 1 101, m 41, b 244, slightly soluble in water, soluble in alcohol or ether **beta-** Colorless crystals, m 61, b 220



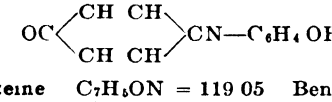
alpha-



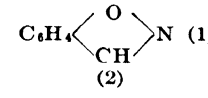
beta-

indophenine $C_{12}H_7ONS$ = 213 19 A colorless powder, soluble in alcohol or ether, but not in water

indophenol $C_{12}H_9O_2N$ = 199 08 Hydroxyphenylimino benzenone A compound of the type

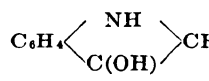


indoxazene C_7H_5ON = 119 05 Benzisoxazole The heterocyclic compound

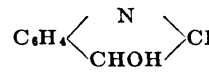


2-phenyl- $C_{13}H_9ON$ = 195 08 Colorless crystals, m 84, b 334

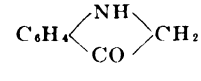
indoxyl C_8H_7ON = 133 1 **α- alpha-** 3-Hydroxyindole,



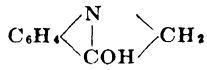
Light yellow crystals, m 85, soluble in water, used in organic synthesis **β- beta-**



ψ- Pseudo- 3-Ketoindoline, **β-indolinone** 3(2)-indolone, 3-ketoindoline



An intermediate in the synthesis of indigo **i-**, **i-**, **Iso-** The heterocyclic compound



i **potassium sulfate** Indican (of urine)

indoxylic acid $C_9H_7O_3N$ = 177 11 An oxidation-product of indoxyl, b 122, (sublimes and decomp), soluble in water

induced Caused or produced indirectly i **current** A high-frequency current produced by an induction coil, q v i **radioactivity** Artificial radioactivity produced by the bombardment of a substance with neutrons, protons or other particles, q v See *radioelements* i **reactions** Sympathetic reactions (1) If a slow reaction between the substances A and C is hastened by promoting a fast reaction between A and B, at the same time and in the same system then A is the *actor* or *donor*, usually an oxidizing or reducing agent, B the *inductor*, and C the *acceptor*

$$A + C \rightarrow AC \text{ (slow)}$$
$$A + B \rightarrow AB \text{ (fast)}$$
$$AB + C \rightarrow AC + B$$

(2) An enzyme which removes an element from a compound and leaves the remainder free to react, acts as an acceptor in an induced reaction, *e g* the water in milk may be split by an enzyme into O and H, which are then able to oxidize and reduce, respectively Cf *induction (4)*

inducer Inductor

inductance See *dielectric constant*

induction (1) A process of inference by which one passes from particular data to general principles Cf *deduction* (2) The production of an electric or magnetic phenomenon by the influence of a neighboring electric or magnetic field, as electrifying by proximity to a charged body or magnetizing by proximity to a magnet It is measured in henrys

1 International henry = 1 00052 absolute henry
1 Absolute henry = 1 practical e m u
= 10^9 e m u
= 1 1124 × 10^{-1} e s u

(3) See *induced reaction* (4) A change in the energy of a molecule produced by interaction with another molecule, which is at a distance from it greater than the diameter of the molecule by means of radiation Cf *collision* **chemical-** See *induction (4)* **electromagnetic-** See *induction (2)* **mutual-** See *mutual induction* **photochemical-** See *photochemical* i **self-** See *selfinduction*

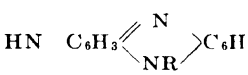
i **coil** Electric transformer A set of two wire spools, one inside the other, used for obtaining high-frequency alternating currents from a continuous current passed through the primary (inner) coil i **furnace** See *furnace*

inductive capacity Di-electric constant

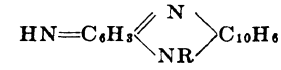
inductivity Di-electric constant

inductor A substance which when added to a reaction mixture accelerates a slow reaction See *induced reactions, catalysts, state*

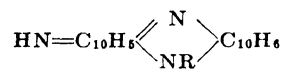
indulines A group of blue or black dyestuffs derived from the tricyclic ring



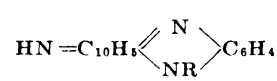
Substitution is usually at the N atom indicated **benz-** Aposafranine **isoros-** A group of dyestuffs derived from



naphth- A group of dyestuffs of the type



ros- A group of dyestuffs of the type



indurated Hardened, as in the firing of clay mixtures, etc

industrial Pertaining to large-scale production as opposed to laboratory methods i **poisons** Those chemicals which may lead to respiratory, intestinal, cardiovascular or other disturbance in the worker handling it The most common are

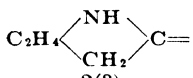
acetaldehyde
acridine
acrolein
amylacetate
aniline
antimony
arsenic
arsine
benzene
brass
carbon disulfide
carbon monoxide
chlorine
chromium
copper
diazomethane
dimethylsulfate
dinitrobenzene
ferrosilicon
formaldehyde
hydrochloric acid
hydrocyanic acid
lead
manganese
mercury
methanol
methylbromide
nitroglycerin
nitrous gases
oxalic acid
petroleum
phenol
phenylhydrazine
phosgene
phosphorous
picric acid
pyridine
sulfuric acid
sulfur dioxide
sulfur chloride
tar
turpentine
dust (q v)

industry The organization of human and material units for the production of some useful material on an economic basis Chemistry enters into many industries, which may be classified as follows

Heavy chemicals, acids and alkalis
Coal coal gas and fuels
Minerals and metals
Dyes, explosives, cellulose, textiles and paper
Synthetics, organic condensation products, plastics
Rubber
Leather
Glass and enamel
Cement and mortar
Pottery, ceramics, and porcelain
Oils, fats, and waxes
Agriculture, foods and packing industries
Brewing, fermentation and yeast products
Tobacco
Inks and printing inks
Pharmaceuticals

indyl The monovalent radical, C_8H_6N—derived from indole **iso-** See *isoindyl*

indylidene A group of bivalent radicals derived from dihydro-indole, as,



2(3)-

-ine A suffix indicating (1) a halogen, as chlorine, (2) a hydrocarbon of the acetylene series as butine, (3) an alkaloid or nitrogen base, as, morphine Cf *-in*

inert Sluggish, having no, or only a slight chemical action **1 elements** The members of the "zero" group of the periodic system the noble gases, which have no valency and do not combine with any other element, cf *noble gases* **1 substance** A substance which is resistant to chemical or physical action

inertia The tendency of a physical body to remain in an unchanged condition, either in a state of uniform motion if moving, or at rest if resting **moment of 1** A factor of fundamental importance in the mathematic treatment of the rotation of a body It is expressed in terms of the mass and squares of the linear dimensions of the body Cf *momentum*

infection The successful invasion and growth of one or more species of bacteria or parasites in the tissues of an organism (plant, animal or man), and thus the transmission of disease by contact Cf *contamination* **aerial-** I caused by the dust particles suspended in air **focal-** Infection in which the bacterial growth is restricted to a small area of the organism **mixed-** Infection caused by more than one kind of bacteria

infectious disease A pathological condition of the organism produced by invasion and growth by one or more microorganisms (bacteria or protozoa)

infiltration (1) The deposition of minerals from solution in the pores of a rock (2) The slow diffusion of injected solutions into the tissues of an organism

infinitesimal Smaller than any assigned quantity Negligible

inflammable Combustible, able to be set on fire **1 air** The original name for hydrogen

infra Beyond **1 phonic** Vibrations in air too long in wavelength to be audible **1 photic** Radiations of a wavelength too long to be visible, as, 1 red **1 red** Ultra-red The invisible part of the spectrum from 10^{-4} to 10^{-1} cm which extends into the portion of the visible spectrum Cf *radiations, ultra-violet far-* or *long-* I r rays from 14 000 to 150 000 A U *near-* or *short-* I r rays from 7 200 to 14,000 A U Sources

	Infrared rays	Visible rays
Sunlight	60 %	34 %
Incandescent lamp	95 %	4 8 %
Carbon arc	80 %	15 %
Resistance wire	99 %	0 5 %

1 rontgen rays Grenz rays **1 sonic** Infra-phonic

infundibuliform A bacterial growth in the shape of a funnel or inverted cone

infusible Unable to be fused **1 white precipitate.** Mercuridiammonium chloride

infusion Infusum An aqueous solution obtained by steeping vegetable drugs in water below its boiling-point, and straining Cf *decoction*

infusoria A class of protozoa Sometimes erroneously applied to diatoms (protophyta)

infusorial earth Diatomaceous earth, tripolite, kieselguhr, q v A light, earthy sedimentary rock consisting of the microscopic empty shells of diatoms and other protophyta Used as a filtration aid, and as an adsorbent

infusum Infusion

ingluvin An enzyme from hen gizzards used in dyspepsia

ingredient Any substance that enters into a mixture Cf *constituent, component*

inhaler (1) A device for the administration of vapors or gases (2) A device for filtering dust from the air to be breathed Cf *gas-mask, respirator*

inhibin The testicular hormone which prevents overdevelopment of the pituitary gland Soluble in water

inhibition A restraint or encumbrance

inhibitor A substance which arrests or stops a chemical action

inhibitory phase Protective *colloid*.

initiator Trigger Cf *promoter*

-inium -ium 1 compound Compounds of organic nitrogen bases with acids in which N is assumed to be pentavalent, as, piperidinium, pyridinium, strychninium Cf *-ilium, -onium*

injection The administration of a substance into a part of an organism, either intravenously (into the blood stream), intramuscularly (into muscular tissue), or subcutaneously (under the skin) **1 needle** A hypodermic needle **1 syringe** A graduated glass-tube with piston, used to inject liquid medicines into an organism

ink (1) A colored liquid, used for writing (2) A colored paste or liquid used for printing **aniline-** A solution of an aniline dye in a volatile solvent or dilute gum, used for printing in bright colors or at high speeds, *e g*, by the gravure process **cancelling-** A suspension of lamp-black in oil, used for stamp pads **Chinese-** India ink **copying-** An iron-tannic acid ink **diamond-** A mixture of barium sulfate and hydrofluoric acid, used for writing on glass **fugitive-** An **1** which disappears on treatment with water or bleaching chemicals Used for printing checks **India-** Finely divided lamp-black suspended in water or gum **invisible-** Secret **1**, sympathetic **1** An **1** which is normally invisible to the human eye, but may be rendered visible by heat (*e g*, lemon juice), light (*e g*, soap solution in ultra-violet light), water (*e g*, solutions of cobalt salts), or chemicals (*e g*, iodine vapour on a starch ink) Used for sending secret messages **marking-** A solution of silver nitrate, used to write indelibly on paper, textiles, laundry, etc **printing-** Three types (1) A suspension of a pigment (usually C black) in a mineral oil It dries by absorption of oil into the paper Used for high-speed letterpress printing (2) A suspension of a pigment in a drying oil (*e g*, linseed oil) It dries by formation of a protective layer of hard linseed oil varnish over the pigment Used for general lithographic and letter-

press work (3) An aniline ink, q v This dries mainly by evaporation (4) A warm molten resinous pigment which dries by simple solidification Used for high-speed printing **secret-** Invisible i **sympathetic-** Invisible i **writing-** (1) Blue-black i Normally, a slightly acidic solution containing principally an iron salt, a tannin and a blue aniline dye (provisional color) The dye renders the ink visible while it is being used, and in course of time oxidation of the iron-tannin compound produces a very permanent blue-black color (2) A solution of an aniline dye in a dilute gum Used for fountain pens, and for colored inks other than black

ino- A suffix that denoting substitution by one of the groups, NH_2, NHR, NR_2 NH or NR Cf *amino, imino*

inoculation (1) The insertion of a virus or virulent vaccine into a wound or scratch in the skin (b) The planting of bacteria on a culture medium

inoculum The substance to be inoculated

innocuous A harmless substance

innoxious Harmless Antonym toxic or noxious

inorganic (1) Unorganic Pertaining to chemicals which do not contain carbon (carbonates and cyanides excepted) Cf *organic* (2) Devoid of an organized structure i **chemistry** Chemistry which deals with inorganic or polar compounds, generally those compounds which do not contain carbon as a principal element i **compound** A substance containing an electropositive element or radical and an electronegative element or radical Generally, mineral substances, or those chemicals which do not contain carbon, (compounds of the polar type)

inose Inositol

inosin $C_{10}H_{12}N_4O_6 = 284\ 1$ Hypoxanthin riboside White needles, m 218, soluble in hot water

inosinic acid $C_{10}H_{13}N_4O_8P = 348\ 13$ Inosin phosphoric acid A nucleotide from adenylic acid of nucleoproteins

inosite Inositol

inositol $C_6H_{12}O_6\ 2H_2O = 216\ 2$ Muscle sugar, cyclohexanhexanol, *1 2 3 4 5 6*-cyclohexanehexol*, dambose, inose, hexahydroxybenzene, Bios I, nucite, phaseomannite, $C_6H_6(OH)_6$ A cyclic hexahydric alcohol found in the seeds of plants (as barley, peas and beans), also in animal flesh, in the form of its phosphoric acid ester (phytin) Optically inactive White crystals, m 200 (decomp), soluble in water, insoluble in alcohol or ether It is part of the vitamin B complex, q v **dextro-** Colorless crystals m 247 **levo-** Colorless crystals m -238

inquartation Quartation

insect bait See *baits*

insecticide An agent used to destroy insects, generally by dusting or spraying on plants (cf *fumigant*) They are conveniently classified (1) **contact** i , I which corrode the surface of soft-bodied insects, as, kerosene, soap, tobacco juice, pyrethrum, lime, rotenone (2) **stomach** i , I which poison through the intestinal tract, namely arsenicals (*e g* , $Ca_3(AsO_4)_2$, $PbHAsO_4$), fluosilicates (Na_2SiF_6, $BaSiF_6$), fluorides (NaF, CaF_2, AlF_3) (3) **gaseous** i , I used as fumigants, as, carbonsulfide, hydrocyanic acid and p-dichlorobenzene vapor

INSECTICIDES

Against	
Aphis	nicotine
Beetles	barium fluosilicate
Codling Moth	beta-naphthol
Crickets	barium fluosilicate
Flea Powder	rotenone, derris
Fly Sprays	pyrethrum
Japanese beetle	carbon disulphide
Leaf Hopper	oil emulsion
Mealy bug	thiocyanates
Mites (ascarides)	derris selenium
Peach Tree borer	p-dichlorobenzene
Red Spiders	selenium
Scale	manganese arsenate

insect powder Pyrethrum flowers The powdered flowerheads of *Chrysanthemum* species, a group of Compositae, used medicinally as a stimulant and local irritant, commercially as an insecticide **Dalmatian-** A powder obtained from *Chrysanthemum cinerariae folium* **Persian-** A powder obtained from *Chrysanthemum roseum*

insect wax Chinese wax

insipid Almost or completely tasteless

insipin $(C_{20}H_{23}O_2N_2)OCH_2CO\ H_2SO_4\ 3H_2O$ Quinine diglycolsulfate A tasteless quinine substitute

in situ In the normal, or natural place or position

insolation Exposure to the sun s rays solarization, irradiation

insolubility The degree of being immiscible with, or insoluble in a liquid

insoluble Incapable of dissolving in a liquid

inspirator (1) Respirator (2) A device for controlling automatically the proportions of the constituents of a mixture of gases, as, gas and air

inspissation Thickening a liquid by evaporation

inspissator An evaporator

instrument A mechanical device, apparatus or appliance

insuccation Soaking a material with water

insulation The process of mechanically placing apart or separating a physical system **electrical-** Preventing the escape of electricity **heat-** Preventing the escape of heat

insulator A protective and separating agent, or non-conductor **electrical-** A device to prevent the passage of electricity from a conductor **thermal-** A packing that is non-conductive to heat

INSULATORS

Substances used for both ELECTRICAL and THERMAL insulation are in CAPITALS
Substances used chiefly for electrical insulation in roman type
Substances used chiefly for *thermal* insulation in *italic* type

Gaseous or liquid
AIR, *water*, hydrocarbons, mineral oil, petrolatum
Resins and waxes
Amber, copal, shellac, rosin, beeswax, ceresin, ozokerite, paraffin
Bituminous
Asphalt, tar, pitch
Fibrous materials
PAPER, Kraft p , Manila p , paraffined p , laminated p , vulcanized p , varnished p , *corrugated p , wood fiber, cardboard, grasses,*

barks, cork, husks, bagasse, peat, PRESSBOARD, COTTON, SILK, *wool, kapok, linen,* varnished cloth, oiled textiles, WOOD, oiled hardwood

Rubber

soft r , vulcanised r GUTTA PERCHA

Vitreous materials

GLASS, *glasswool,* porcelain, enamel, *slag*

Mineral materials

ASBESTOS, oiled asbestos, varnished asbestos, (Ambrion, Gummon Hemit, Tegit, etc), mica, marble, SLATE, serpentine, *diatomite, coal, fuller's earth, clay* Cf *refractories*

Plastics

Nitrocellulose products (pyroxylin), Phenol products (bakelite, redmanol, condensite)

insulin $C_{45}H_{69}O_{14}N_{11}S\ 3H_2O$ Iletin, glucokinin White, *l*-rotatory crystals, m 233 A protein hormone substance It is secreted by the Islets of Langerhans in the pancreas, and a deficiency of it results in diabetes it is prepared from beef pancreas for use medicinally as a cure for diabetes Its aqueous solution is standardized in "units," each unit being one-third of the amount required to lower the blood-sugar in a normal rabbit for a given time On hydrolysis it yields glutamic acid, cystine, tyrosine and other amino acids Cf *synthalin, myrtilin, agmatine*

intaglio A process of printing from plates which have been etched slightly in recess, the ink filling these is absorbed by the paper

intarvin $C_{54}H_{104}O_6 = 848\ 7$ Margarin, glycerol trimargarate, $C_3H_5(C_{16}H_{33}COO)_3$ A fat used in diabetes, to cause an increase of sugar, but not of β-hydroxybutyric acid

integration (1) Assimilation or synthesis, as opposed to disintegration (2) Mathematical the summation of a series of values of a continuously varying quantity Cf *calculus*

intensification (1) A process of concentrating force (2) In photography, to increase the density of the silver deposit or activated image

intensity The strength or amount of energy per unit space **acid-** Hydrogen ion concentration **color-** The (1) brilliance or (2) saturation of a color Cf *Beer's law* **electric-** The electric moment per unit volume **electric field-** The force exerted on a unit charge, or the electric field which exerts a force of one dyne on a unit positive charge **heat-** Temperature **light-** Brightness **magnetic field-** The force acting on a unit magnetic pole, or the magnetic field which exerts a force of one dyne on unit magnetic pole (Gauss) **magnetization-** The magnetic moment per unit volume **sound-** Degree of loudness

1 **factor** (*of acidity*) *p*H, (*of redox*) *r*H

inter- A prefix from the Latin, indicating between

interenin A hormone from the suprarenal gland, containing 30 % chlorine

Interessen Gemeinschaft I G A co-operative organization of large German chemical industries

interface Interphase The boundary between two phases Cf *zone*

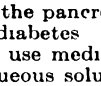
interference A conflict between two agencies which produces a retardation effect, or a waste of energy **light-** Two sets of light waves which annul each other and produce darkness **sound-** Two sets of sound waves which annul each other and produce silence

1 **colors** Complementary *colors*

interferometer An instrument to determine the wavelength of light by the production of interference with waves of known lengths Cf *fringes*

intermediate A chemical used in organic synthesis in the production of pharmaceuticals, dyes, or other artificial products, usually a derivative of the "crudes" or raw materials

intermolecular Referring to action between the same or different molecules Cf *intramolecular*

internal Pertaining to the inside *e g* , of a molecule Synonym intramolecular 1 **anhydride** A compound formed by elimination of water from the atoms of a molecule 1 **compensation** The property of an optically-inactive molecule that contains two asymmetric carbon atoms, one of which is dextro-, the other levo-rotatory 1 **reaction** A reaction within the molecule of a compound, due to a rearrangement of the atoms 1 **salts** An organic compound formed by the union of a basic and acid radical within the molecule, *e g* , R  O derived from NH_2-R SO_3H 1 **standard** The principal line in the spectrum used in spectrum analysis *e g* , by the logarithmic sector method, q v Cf *homologous lines*

international Agreed upon between nations, as, 1 candle, 1 henry, 1 ohm 1 **atomic weight** A value for the atomic weight selected from the literature of the preceding year by a commission consisting of the leading chemists of several nations, 15 years after World War I cooperation had ceased, and each national chemical society published annually its own atomic weights 1 **catalogue** A reference list and index of the scientific literature of the world Since World War I the publication has ceased, and the newer literature must be sought in the abstract Journals 1 **tables** A list of constants selected by an international commission, which embodies the latest values of chemical, physical biological and other data 1 **unit** (1) See *unit* (2) I U A measure of the vitamin potency of a substance, see *vitamin units*

interphase Interfacial *zone*

interpolation The deduction of a value of a varying quantity, from values already known, by arithmetical or graphical methods

interruptor A device for breaking an electric current

interstice A small space or capillary in a structure or tissue **atomic-** The distance between the atoms in a molecule

intertraction Barophoresis The increase in density of a colloidal solution (*e g* , albumin) placed on a salt-solution of nearly equal density, due to the rapid diffusion of the solute

interval The period of time elapsing between two events

intolerance The inability to withstand the drastic effects of a drug

intoxication The state of being poisoned by a drug

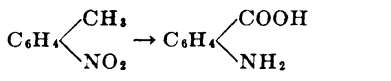
intra- A prefix from the Latin, indicating within

intra-annular Within the ring 1 **tautomerism** The redistribution of double bonds within a ring Cf *intranuclear*

intra-atomic Pertaining to atomic structure 1 **matter** The material from which atoms are assumed to be constructed, *e g* , electrons and positive nuclei, or hydrogen and helium nuclei Cf *mass-energy cycle, particles*

intramine $C_{12}H_{12}N_2S_2$ = 248 1 *o o'*-Dithiobisaniline, contramine $[C_6H_4(NH_2)S—]_2$, used as an antiseptic

intramolecular Pertaining to the inside of molecules or to molecular structure Cf *internal, intermolecular* ı **action** A reaction occurring within the individual molecule ı **condensation** Ring formation A reaction of organic compounds, in which the atoms within a molecule combine or rearrange themselves and form a condensation product (usually a ring compound) and another (usually a binary) compound ı **oxidation and reduction** The reaction of an organic compound caused by internal oxidation and reduction, as the change from nitrotoluene to anthranilic acid which takes place on heating with alkalis



intramuscular Inside muscular tissue, *e g*, an injection

intranuclear (1) Within an atomic nucleus (2) Within a molecular ring-system ı **tautomerism** The shifting of a double bond within one or more rings, *e g*, in sterols

intravenous Within or inside the blood vessels, *e g*, an injection

intravital Within the living organism ı **microscopy** The study and examination of vital organs or living cells by fluorescence microscopy, q v

introducing To cause one or more different atoms to combine with an organic molecule, *e g*, chlorination

introduction The entrance of a different type of atom into an organic molecule, *e g*, the combining of chlorine with a hydrocarbon Cf *chlorination, bromination*

introfaction A change in the fluidity and specific wetting properties of an impregnating material, caused by the addition of an introfier, which alters a colloidal sol to a fluid with slightly associated simple molecules

introfier Impregnation accelerator A substance which speeds up the penetrating power of fluids, as, **sulfur-** Naphthalene or its derivatives which, when added to molten sulfur, effect an increased rate of impregnation of the sulfur into fiberboards, wood, asbestos or concrete

intrusion Material forced into the cavities or pores of a substance

intumescence (1) The swelling up of a material, especially certain crystals, on heating (2) Popping, puffing The violent escape of moisture on heating, as, in poplox, $Na_2O,3\ 2SiO_2$

inula Elecampane, alant root, elfwort, horseheal, helenium The dried rhizome of *Inula helenium*, a Compositae of U S, Europe and Central Asia It contains carbohydrates, possesses an aromatic odor, and is used as an expectorant and stimulant ı **camphor** Helenin

inulase A hydrolytic enzyme derived from fungi and other plants, which changes inulin to levulose

inulenin $(C_6H_{10}O_5)_x\ 2H_2O$ A carbohydrate associated with inulin Microscopic colorless needles, slightly soluble in water

inulic acid Alantic acid

inulin $C_{36}H_{62}O_{31}$ = 990 8 Alant starch, alantin, dahlin, sinistrin A carbohydrate from the rhizome of *Inula helenium* or *Dahlia variabilis* A white starch-like powder, soluble in hot water, used in bacteriology as a culture medium, m 160 (decomp) **pseudo-** $(C_6H_{10}O_5)_6$ A polysaccharide, irregular granules, soluble in hot water Inulin sources are

elecampane	*Inula helenium*
dahlia	*Dahlia variabilis*
Jerusalem artichoke	*Helianthus tuberosus*
chicory	*Cichorium intybus*
dandelion	*Taraxacum officinale*
burdock root	*Lappa minor*
goldenrod root	*Solidago*
camas root	*Quamasia quamash*

in vacuo In a vacuum, q v

invar A ferro-nickel which contains 36 % Ni, and 64 % steel (carbon content 0 2 %), d 8 0, m 1500 It has a low coefficient of heat expansion, and is used for watch parts and precision instruments

inversion (1) The turning of a levo- to a dextro-compound, or vice versa (2) The change of an isomeric compound to its opposite, as a cis- to a trans-compound (3) The hydrolysis of an optically-active disaccharide to two optically-active monosaccharides, *e g*, the hydrolysis of cane sugar to dextrose and levulose by dilute acids, alkalis, or enzymes, the resulting solution shows a change in the rotation of polarized light, both in direction and degree Cf *Walden* ı *Clerget* ı ı **point** The temperature at which inversion takes place *E g*, above 26°C a racemic sodium tartrate crystallizes, while below 26°C the d- and l-sodium tartrate crystallize

invert sugar A mixture of approximately 50 % dextrose and 50 % levulose obtained by the acid hydrolysis of cane sugar It is slightly levo-rotatory, fermentable, reduces Fehling's solution, used in brewing

invertase Saccharase, sucrase, raffinase, invertin A carbohydrase of the pancreatic juice and of yeast, which converts cane sugar into invert sugar

invertin Invertase

inverting The process of inversion

in vitro Describing a biological reaction which occurs outside the living organism, and which can be performed in the test tube Antonym *in vivo*

in vivo A reaction which takes place within the living organism Antonym *in vitro*

inyoite $2CaO\ 3B_2O_3\ 13H_2O$ A native calcium borate occurring in Southern California (Inyo County)

iod- See *iodo-, iodi-*

iodacetanilide C_8H_9INO = 260 9 Iodantifebrin $C_6H_4INHCOMe$ Colorless crystals, m 182, insoluble in water, soluble in alcohol, used as an antipyretic

iodacetone C_3H_5OI = 184 1 Iodoacetone, monoiodoacetone, $CH_2I\ CO\ CH_3$ A colorless crystalline substance, used in the treatment of carbuncles

iodagol A colloidal iodine preparation, used as an antiseptic

iodal C_2I_3OH = 421 77 A hypnotic liquid which resembles chloral

iodalbin A compound of blood albumen and iodine, a red, tasteless powder of peculiar molasses-like odor

iodaniline Iodoaniline

iodanisole C_7H_7OI = 234 2 Orthoiodanisole, C_6H_4IOMe A yellow liquid, d 1 80, b 240, insoluble in water, miscible with alcohol, ether, or

chloroform, used as an antiseptic and local irritant

iodantifebrin Iodacetanilide

iodate A salt of iodic acid, containing the monovalent IO_3^- radical

iodeikon Sodium tetraiodophenolphthalein, used as an x-ray contrast medium

iodeosin $C_{20}H_8O_5I_4$ = 835 4 Erythrosin, tetraiodofluorescein A red powder, soluble in alcohol or ether, and used as indicator in titrating dilute alkalis Alkalis, rose-red, acids, yellow **1 solution** A test solution or indicator containing 0 002 gm iodeosin in 1000 cc ether Of this 10–20 cc is added to the dilute alkali and titrated until the rose-tint passes from the ether into the aqueous solution

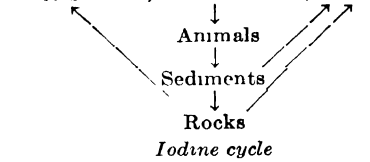
iodi- See *iodo-*

iodic acid HIO_3 = 175 93 A colorless rhombic crystalline powder, d 4 629, m 110, decomp 270, soluble in water, alcohol or ether Used as an oxidizing agent, reagent for alkaloids, biliary pigments, naphthol, sulfocyanides, and guaiacol, in organic synthesis, and for volumetric solutions **1 anhydride** Iodine pentoxide

iodide A binary compound of iodine with a metal of the type MI **1 ion** The monovalent, negative I^- ion

iodimetry Iodometry

iodine I_2 = 253 84 or I = 126 92 Iodum A non-metallic element, atomic number 53, belonging to the halogen group Rhombic, bluish-black plates or scales of metallic luster, d 4 948, m 114, b 184 slightly soluble in water, soluble in alcohol, ether, or iodide solutions Iodine was discovered in 1811 by Courtois and named after its purple vapors from the Greek iodes (the violet) and ion (similar) It is obtained from the mother liquor of Chile saltpeter and the ashes of sea weeds, and occurs in small quantities widely diffused through nature



Iodine cycle

Its usual valency is one (iodides), but may be three (iodonium) or five (iodates) Used as a reagent in volumetric analysis, in organic synthesis, in the manufacture of iodides, iodates and iodine preparations, and medicinally as an alterative, antiseptic and caustic **eka-** Eline **fluoro-** Fluoroiodine **solution of-** (1) Lugol solution (2) *colorless* Lugol solution decolorized with sodium thiosulfate (3) Iodine water, q v **tincture of-** An alcoholic 7 % iodine solution in 5 % potassium iodide solution **1 acetate** $I(C_2H_3O_2)_3$ = 304 00 A solid prepared from chlorine dioxide and iodine in glacial acetic acid **1 bromides** IBr, 1 monobromide, IBr_3 1 tribromide, IBr_5, 1 pentabromide **1 chlorides** ICl, 1 monochloride, ICl_3, 1 trichloride **1 cyanide** ICN = 152 9 Cyanogen iodine Colorless crystals, m 146, soluble in water or alcohol An extremely poisonous substance, used as an animal poison and for the preservation of insect and mammal collections, furs, birds, etc **1 dioxide** IO_2 = 158 93 or I_2O_4 = 317 86 A lemon-yellow powder, decomposing into its elements at 130°C **1 disulfide** Sulfur iodide **1 green.** A phenolphthalein dye, used as *p*H-indicator, changing at 1 0 from yellow (acid) to blue-green (alkaline), also to stain liquefied xylem in plant tissues **1 fluoride** See *1 pentafluoride* and *1 fluoriodide* **1 monobromide** IBr = 206 8 A purple crystalline mass, m 36, soluble in water (decomp) Used in analysis for determining iodine numbers, and in organic synthesis **1 monochlor de** ICl = 162 4 A reddish-brown oily liquid, d 3 182, m 25, b 101 (decomp), decomp by water, soluble in alcohol or ether, used in analysis and organic synthesis **1 number** Iodine absorption value, Hubl number, Wijs number The quantity of iodine (in mg) absorbed by one gram fat or oil under specified conditions, it indicates the amount of unsaturated acids present *hydro-* The number of parts of hydrogen (calculated as the equivalent amount of iodine) absorbed by 100 parts of a fat **1 oxide** (1) I dioxide (2) I pentoxide (3) I_4O_9 (?) = 651 73 A green powder, a supposed oxide of iodine **1 pentabromide** IBr_5 = 526 7 A brown liquid, decomp by water, used as a reagent **1 pentafluoride** IF_5 = 221 93 A compound of 5-valent iodine, m −8, b 97 **1 pentoxide** I_2O_5 = 333 9 Iodic anhydride A white crystalline powder soluble in water, insoluble in alcohol, used as an oxidizing reagent and in organic synthesis **1 perchlorate** $I(ClO_4)_3.2H_2O$ = 461 34 Yellow-green crystals **1 sulfate** $I_2(SO_4)_3$ = 542 07 Yellow crystals, soluble in water **1 tincture** See *tincture of 1* **1 tribromide** IBr_3 = 366 7 Tribromiodine A brown liquid, soluble in water or alcohol, used as an antiseptic **1 trichloride** ICl_3 = 233 3 A yellow deliquescent crystalline powder, decomp 25 soluble in water, alcohol, or benzene, used as an antiseptic and disinfectant **1 value** I number **1 water** An aqueous solution of iodine containing 0 2 gram iodine per liter Used as a reagent (detection and determination of starch), and in microscopy

iodipin An iodine addition-product of the fatty acids of sesame oil used as an alterative and as x-ray contrast medium

iodite A salt of the hypothetical iodous acid containing the $=IO_2$ radical **hypo-** A salt of hypoiodous acid of the type MOI

iodo- A prefix indicating the presence of an iodine atom in an organic compound Cf *iodonium iodoso, iodoxy*

iodoacetanilide Iodacetanilide

iodoacetic acid CH_2ICOOH = 185 95 Iodacetic acid, carboxymethylhiodide Yellow crystals m 82, decomp on further heating insoluble in water, soluble in alcohol

iodoaniline $C_6H_4INH_2$ = 219 0 Amino-iodobenzene **ortho-** Colorless needles m 57 **meta-** Colorless leaflets, m 25 **para-** Colorless needles m 63 All are insoluble in water, soluble in alcohol or ether and used in organic synthesis

iodobenzene C_6H_5I = 204 0 A colorless liquid, m −28, b 188, insoluble in water, soluble in alcohol or ether

iodocasein A compound of milk casein and iodine (18 %) A yellow-brown powder, odorless, tasteless, and insoluble in water

iodocrase Vesuvianite The mineral, $Ca_6[Al(OH,F)]\ Al_2(SiO_4)_3$

iodocresine, iodocresol Traumatol

iodocrol Carvacrol iodide

iodoethylene $CH_2\ CHI$ = 153 9 Vinyl iodide A colorless liquid, d 2 08, b 56, slightly soluble in water, soluble in alcohol or ether

iodoform CHI_3 = 393 8 Triiodomethane, methenyl iodide, formyl triiodide Iodoformum (U S P) Small hexagonal, yellow crystals, d 4 08 subliming at 119, slightly soluble in water or alcohol, soluble in ether or chloroform, decomp on further heating An antiseptic for wounds, alterative and antituberculant

iodoformin A colorless, odorless substitute for iodoform

iodogorgoic acid $C_9H_9I_2NO_3$ = 432 92 *3 5*-Diiodotyrosine $HO\ C_6H_2I_2\ CH_2CH(NH_2)COOH$ An amino acid from proteins, occurring in two forms *dl-* Rectangular prisms, m 204 *d-* White needles m 194

iodohydromol Thymol iodide

iodol C_4HI_4N = 570 74 Tetraiodopyrrole An odorless, amorphous brown powder, used as an antiseptic, m 150 (decomp)

iodoleine An iodized poppyseed oil, used medicinally

iodomethane Methyliodide

iodometric Iodimetric Pertaining to analysis with standard iodine solutions

1 acid value Acidity determined in terms of the amount of iodine liberated from an iodide-iodate mixture

iodometry Iodimetry A method of volumetric analysis, by titrating with a standard iodine solution with standard sodium thiosulfate solution, (usually 0 1N) Based on the reaction

$$I_2 + Na_2S_2O_3 \leftrightarrows 2NaI + Na_2S_4O_6$$

Starch solution is indicator This method is useful in determining chlorine, bromine, iodine, chlorides, bromides, iodides, hydrogen sulfide, sulfur dioxide and sulfites, arsenous and arsenic acid and their salts manganese dioxide, ferrous salts, etc

iodonium The trivalent iodine atom $\equiv I$ occurring in an organic compound **1 hydroxide** The bivalent radical $=I{-}OH$, as diphenyliodonium hydroxide Ph_2IOH **1 iodide** The bivalent radical $=I{-}I$, as in diphenyliodonium iodide $Ph_2I\ I$

iodophen Nosophen

iodophosphonium Phosphonium iodide

iodopropionic acid $C_3H\ O_2I$ = 200 0 **alpha-** $MeCH_2ICOOH$ Colorless prisms m 45 slightly soluble in water **beta-** CH_2ICH_2COOH Colorless leaflets, m 82, slightly soluble in water

iodoso- The monovalent $-IO$ radical derived from iodonium hydroxide **1 benzene** C_6H_5IO = 220 0 Colorless amorphous powder, exploding at 210, soluble in water or alcohol, insoluble in ether

iodosol Thymol iodide

iodous acid The hypothetical acid H_2IO_2, known as its salts **hypo-** The unstable acid HIO, which decomposes to HI and HIO_3

iodotannic acid Iodotannin A dark brown powder obtained from iodine and tannic acid, used as an alterative and astringent

iodothyrin $C_{11}H_{10}O_3NI_3$ = 584 89 The iodine compound of the thyroid glands

iodotoluene C_7H_7I = 218 0 Methyliodobenzene **ortho-** A colorless liquid, d 1 69, b 211 **meta-** A colorless liquid, d 1 70, b 204 **para-** Colorless leaflets, m 35, b 211 All insoluble in water, soluble in alcohol or ether

iodoxy The monovalent radical $-IO_2$ **1 benzene** $C_6H_5IO_2$ = 236 0 Colorless needles, m 167, exploding at 230, slightly soluble in water, soluble in alcohol, chloroform or benzene

iodstarin $Me(CH_2)_{10}CI_2(CH_2)_4COOH$, *6 6*-diiodoheptadecanoic acid*, decomp by light to tariric acid, q v

iodum The U S P name for iodine

iodylin A bismuth iodosalicylate, used as an iodoform substitute in medicine

iodyrite A native silver iodide, AgI

iolanthite A jasper from Crooked River, Oregon, used as gem

iolite $Mg_4Al_8O_8(SiO_3)_{10}$ Cordierite, dichroite, water sapphire A blue orthorhombic magnesium aluminum metasilicate, hardness 7 d 2 65, used as gem Cf *aspasiolite, gigantolite, praseolite*

ion An electrically charged (1) atom, (2) radical or (3) molecule, if positively charged it is called a *cation* (or *posion*), if negatively charged an *anion* (or *negion*) They travel in solution to the cathode (posode) and anode (negode), respectively Cf *ionic theory* The following suffixes have been proposed

-ion	for metals (*e g*, sodion for sodium ion)
-idion	for -ides (chloridion for chloride ion)
-anion	for -ates (chloranion for chlorate ion)
-osion	for -ites (chlorosion for chlorite ion)
hypo-osion	for hypo- -ite (hypochlorosion for hypochlorite ion)

Ions may be grouped into

(1) positively charged atoms—an atom which yields respectively one two, or three electrons and thereby becomes positively charged K or K^+ potassium ion

Ca or Ca^{++} calcium ion
Al or Al^{+++} aluminum ion

(2) negatively charged atoms—an atom which attracts an additional electron and becomes thereby negatively charged

Cl′ or Cl^- chloride ion
S″ or S^{--} sulfide ion

(3) positively charged radicals—a group of atoms which loses one or more electrons

NH_4 or NH_4^+ ammonium ion

(4) negatively charged radicals—a group of atoms which attracts one or more electrons

NO_3' or NO_3^+ nitrate ion
SO_4'' or SO_4^{++} sulfate ion

(5) positively charged molecules—a gaseous molecule which has lost one or more electrons

H_2^+ ionized hydrogen

(6) negatively charged molecules—a gaseous molecule with one or more additional electrons

N_2^- ionized nitrogen

acid- Anion **aquated-** An i surrounded by oriented water molecules Cf *solvated* **amphoteric-** Zwitter i **basic-** Cation **colloidal** Micelle **hydrogen-** See *hydrogen* **hydroxyl-** See *hydroxyl* **molecular-** A gaseous ion which is either positively or negatively charged, *e g*, a molecule which has lost or gained electrons under the influence of electric discharges or radiation Cf *activation, excitation* **negative-** Anion **positive-** Cation **solvated-** An i which is surrounded by oriented molecules of solvent **zwitter-** Amphoteric- An i containing both, a negative and positive charge, as, $^+NH_3RCOO^-$

i **product** Solubility product i **states** Matter can exist ionically in all three forms of aggregation, *i e*,

(a) **solid i**—surrounded by oppositely charged ions, as in a polar crystal

(b) **liquid i**—surrounded by oriented molecules of the solvent, as in a solution

(c) **gaseous i**—with kinetic motion overcoming electrostatic charge, as in an ionized gas

ionene $C_{13}H_{18}$ = 174 14 *1 2 3 4*-Tetrahydro-*1 1 6*-trimethyl naphthalene A hydrocarbon formed on dehydration of ionone (q v) Cf *irene*

passage of a current by means of ions i migration The bodily transfer of ions toward the anode or cathode, as, in electrolysis i **mobility** (1) The motion of ions in a solution analogous to the motion of molecules in gases It is expressed numerically by the velocity under a gradient of 1 volt per centimeter, and it is a periodic function of the atomic weight H^+, 3 25 × 10^{-4}, OH^-, 1 78 × 10^{-4}, K^+ 6 5 × 10^{-4} cm per sec (2) The velocity of ions under the influence of an electric current i **number** The number of extra-nuclear electrons of an ion It equals the atomic number plus or minus the valence electrons The commoner i n s and the distribution of their component electrons are

ionic numbers

	K	L	M	N	O	P
2 =	2					
8 =	2	8				
18 =	2	8	8			
28 =	2	8	18			
36 =	2	8	18	8		
46 =	2	8	18	18		
54 =	2	8	18	18	8	
68 =	2	8	18	32	8	
78 =	2	8	18	32	18	
86 =	2	8	18	32	18	8

valence shells

i **potential** Assuming the ion in a crystal to be a charged sphere of definite extension, then the i p = valence/radius of ion It is a periodic function of the ions (see table) Cf

Pb^{4-} 86	Bi^{3-} 86			Nt 86 0		Ra^{2+} 86 1 24	Ac^{3+} 86 1 57	Th^{4+} 86 1 90	IONIC NUMBER (upper numeral) The number of extra-nuclear electrons of an ion			
Sn^{4-} 54 −1 17	Sb^{3-} 54 −1 10	Te^{2-} 54 −0 95	I^- 54 −0 68	Xe 54 0	Cs^+ 54 0 77	Ba^{++} 54 1 21	La^{3+} 54 1 61	Ce^{4+} 54 2 00	IONIC POTENTIAL (lower numeral) The valence divided by the ionic radius Values given are the square-roots For the position of an element see PERIODIC TABLE			
Ge^{4-} 36 −1 21	As^{3-} 36 −1 16	Se^{--} 36 −1 00	Br^- 36 −0 71	Kr 36 0	Rb^+ 36 0 82	Sr^{++} 36 1 33	Y^{3+} 36 1 79	Zr^{4+} 36 2 24				
Si^{4-} 18 −1 22	P^{3-} 18 −1 19	S^{2-} 18 −1 04	Cl^- 18 −0 74	A 18 0	K^+ 18 0 87	Ca^{++} 18 1 42	Sc^{3+} 18 1 92	Ti^{4+} 18 2 43				
C^{4-} 10 −1 24	N^{3-} 10 −1 32	O^{2-} 10 −1 19	F^- 10 −0 86	Ne 10 0	Na^+ 10 1 02	Mg^{++} 10 1 86	Al^{3+} 10 2 45	Si^{4+} 10 3 15	P^{5+} 10 3 83	S^{6+} 10 4 55	Cl^{7+} 10 5 20	
			H^- 2 −0 69	He 2 0	Li^+ 2 1 29	Be^{++} 2 2 54	B^{3+} 2 3 87	C^{4+} 2 5 16	N^{5+} 2 6 71	O^{6+} 2 8 19	F^{7+} 2 10 0	
Negative Ions				Neutral	H^+ 0 3 0	Positive Ions						
Ti^{4+} 18 2 43	V^{5+} 18 2 92	Cr^{6+} 18 3 39	Mn^{7+} 18 3 90	Fe^{6+} 20	Co^{3+} 24	Ni^{++} 26	Cu^+ 28 1 02	Zn^{++} 28 1 64	Ga^{3+} 28 2 20	Ge^{4+} 28 2 74	As^{5+} 28 3 26	Se^{6+} 28 3 78	Br^{7+} 28 4 24
Zr^{4+} 36 2 24	Cb^{5+} 36 2 66	Mo^{6+} 36 3 11	Ma^{7+} 36 3 56	Ru^{8+} 36 4 01	Rh^{6+} 39	Pd^{4+} 42	Ag^+ 46 0 89	Cd^{++} 46 1 44	In^{3+} 46 1 92	Sn^{4+} 46 2 36	Sb^{5+} 46 2 84	Te^{6+} 46 3 27	I^{7+} 46 3 74
Rare Earth Metals Pr^{+++} to Lu^{+++}													
Hf^{4+} 68 2 25	Ta^{5+} 68 2 65	W^{6+} 68 3 05	Re^{7+} 68 3 45	Os^{8+} 68 3 85	Ir^{6+} 71	Pt^{4+} 74	Au^+ 78 0 85	Hg^{++} 78 1 35	Tl^{3+} 78 1 78	Pb^{4+} 78 2 18	Bi^{5+} 78 2 60	Po^{6+} 78 3 02	
Th^{4+} 86 1 90	Bv^{5+} 86 2 23	U^{6+} 86 2 56											

ionic Pertaining to electrically-charged atoms, radicals, or molecules i **charge** The unit electrical charge carried by the hydrogen ion, e = 4 77 × 10^{-10} e s u or 1 59 × 10^{-20} e m u **units** i **conductivity** The amount of electricity carried by the ions in solution, or the *ionization potential* i **reactions** The reactions characteristic of an ion, as, the precipitation of Cl^- by Ag^+, or of SO_4^{--} by Ba^{++} i **radius** The distance in Ångstrom units of the periphery of the effective sphere from the center of a charged atom or group of atoms

2−	1−	1+	2+	3+	4+
		Li 0 78	Be 0 34		
O 1 32	F 1 33	Na 0 98	Mg 0 78	Al 0 57	Si 0 39
S 1 74	Cl 1 81	K 1 33	Ca 1 06	Sc 0 83	Ti 0 64
Se 1 91	Br 1 95	Rb 1 49	Sr 1 27	Y 1 06	Zr 0 87
Te 2 11	I 2 20	Cs 1 65	Ba 1 43	La 1 22	Ce 1 02
		NH_4 1 43	Zn 0 83	Cr 0 64	Mo 0 68
		Tl 1 49	Cd 1 03	Mn 0 70	W 0 68
		Ag 1 13	Hg 1 12	Fe 0 67	V 1 05

i theory The theory according to which electrolytes split into component ions whenever they are dissolved in water **i velocity** The product of the mobility of an ion and the actual potential gradient Cf *migration*

ionidine $C_{19}H_{25}O_4N_4 = 373\ 5$ An alkaloid obtained from the California poppy, *Eschscholtzia californica*

ionium Io = 230 5 A radioactive isotope, atomic number 90 (thorium), formed by the disintegration of uranium X It emits β- and γ-rays and is transformed into radium

ionise Ionize

ionization, ionisation (1) Electrolytic dissociation The breaking up of a molecule into two or more negatively- and positively charged components (ions) It usually occurs when a polar compound is dissolved in water and is expressed by the equations (*e g*)

$$NaCl \rightarrow Na^+ + Cl^-$$
$$Al_2(SO_4)_3 \rightarrow 2Al^{+++} + 3\ SO_4^{--}$$

Cf *solvation, acidity, electromotive force, displacement series* (2) The removal of one or more outer electrons from an atom or molecule, by which gases become electrically charged under the influence of a strong electro-static field or radioactive rays

$$H_2 \rightarrow H_2^+ + e$$

Cf *excitation, i potential, spectrum, luminescence* **degree of-** The ratio of the molecules which become ionized at a given temperature and concentration of solution, to those molecules which remain unionized, generally expressed as a percentage It is given numerically by the ratio of the equivalent conductivity under the conditions concerned to that of the solution at infinite dilution Most salts and the "strong" or active acids and bases are from 80–95 % ionized in N/10 solution Cf *activity coefficient, acidity, hydrogen ion concentration*

i constant The analogue of the dissociation constant, $k = \frac{[H^+][X^-]}{[HX]}$, in the application of the Law of Mass Action to ionisation **i gage** See *gage* **i potential** The amount of energy V, in volts, required to remove an electron from an atom in its normal state, it is related to the wavelength of any ray λ, in Ångstroms, by the equation $V = 12\,345/\lambda$ Cf *energy levels, Bohr atom, orbits, quantum* Thus for sodium the transition (1s − 1p) gives lines $\lambda\lambda$ 5896, 5890 (D-line), where V is 2 11 volts, as the excitation potential for the 1p state, the transition (1p − 2d) gives $\lambda\lambda$ 8195, 8184 and 1 51 volts as the excitation potential, and adding 2 11 + 1 51 gives 3 62 as the excitation potential for the 2d state The sum of the excitation potentials from the 1s state to the limit will be 5 11 volts which is the i potential of sodium Cf *ionic potential*

ionize To dissociate into ions or to become electrically charged

ionized, ionised (1) Describing a molecule which is separated into oppositely-charged atoms or radicals, the sum of positive and negative charges being zero (2) Describing a molecule or atom from which electrons have been removed whereby it becomes positively charged, as, $He \rightarrow He^+$ **non- or un-** Remaining in the molecular condition, not dissociated

ionizing The process of ionization q v **i potential** Ionization potential **i solvent** A liquid which facilitates ionization, *e g*, water liquid ammonia (ammonia-system), or liquid sulfur dioxide Organic liquids are generally non-ionizing

ionocolorimeter A colorimeter used for pH determinations

ionogenic A little-used term for ionic

ionone $C_{13}H_{20}O = 192\ 2$ A ketone terpene, $Me_3C_6H_6CH\ CHCOMe$, and isomer of irone α- A colorless liquid d 0 934, b 120 β- A colorless liquid, d 0 949, b 135 Both are slightly soluble in water, soluble in alcohol or ether, and used in perfumery as artificial extract of violets

ionosphere The radio-reflecting layer of the upper atmosphere consisting of daily-changing areas of ionized molecules It is part of the Kennelly-Heaviside layer

ionotropy The existence of tautomeric ions, a positive or negative atom or group becoming detached from an unsaturated molecule thus leaving a − or + charge on the residual ion, the position of this charge may vary, resulting in the presence of two isomeric ions in dynamic equilibrium When the detached atom is positive (H^+, M^+, NH_4^+) the phenomenon is called *cationotropy*, when it is negative (OH^-, X^-) *anionotropy*, in the special case of H^+, *prototopy* (cf *pseudo-acid*), and in the case of OH^-, *pseudobasicity* (cf *pseudo-base*)

iopax Uroselectan Sodium-2-oxo-5-iodopyridine-*N*-acetate A compound used in pyelography

iosol Thymol iodide

iothion Diiodohydroxypropane, diiodopropyl alcohol A yellow, oily liquid, d 2 4, insoluble in water, soluble in alcohol, ether, chloroform or oils, used in external iodine ointments

Ipatiev reaction The preparation of alcohols by the catalytic reduction of ketones with nickel oxide under pressure

Ipatiew Ipatiev

ipecac Ipecacuanha, ipecac root The dried root of *Cephaelis ipecacuanha* (Rio ipecac) or *Cephaelis acuminata* (Carthagena ipecac), of the

family Rubiaceae It contains 1 75 % alkaloids (emetine, cephaline, etc), used as an emetic, anti-amebic, stomachic and expectorant, usually as the fluid extract **American-** Gillenia **Goanese-** Naregamine

ipecacuanhic acid $C_{14}H_{18}O_7$ = 298 12 A reddish brown powder from the roots of *Psychotria ipecacuanha*

ipoh A Malay name for various arrow poisons derived from Strychnos species Cf *upas*

ipomic acid Sebacic acid

ipomoea (1) Mexican scammony root The dried root of *I orizabensis*, a Convolvulaceae (2) A genus of Convolvulaceae, (q v), yielding jalap and turpeth, used as a cathartic

ipomoein A globulin from the sweet potato, *Ipomoea batatas*

ipral $Ca(C_9H_{13}O_3N_2)_2\ 3H_2O$ Trade name for the calcium salt of ethylisopropyl barbituric acid Colorless crystals, m 202, soluble in water, insoluble in alcohol, used as a hypnotic

ipsilene A gaseous disinfectant made by heating ethyl chloride and iodoform under pressure

ipuanine Artificial *emetine*

Ir The symbol for iridium

ipuranol $C_{23}H_{38}O_2(OH)_2$ = 380 31 An alcohol from buphane, m 290

iradiation Irradiation

iregenone $C_{13}H_{20}$ = 176 20 A terpene-like hydrocarbon, $MeEtC_6H_3\ CMe_2$, in the roots of the Iris species

irene $C_{14}H_{20}$ = 188 17 *1 2 3 4*-Tetrahydro-*1 1 2 6*-tetramethylnaphthalene A hydrocarbon and white solid Cf *irone, ionene*

iretol $C_7H_8O_4$ = 156 1 1 *2 3*-trihydroxy-*5*-methoxybenzene, *5*-methoxypyrogallol, $MeO\text{-}C_6H_2(OH)_3$ Colorless crystals, m 186, used in perfumery

Iridaceae A family of plants which yield the following drugs

Iris florentina	orris
Iris foetidissima	gladwin
Iris pseudacorus	yellow flag
Iris versicolor	iris

iridescence The display of rainbow colors on the surface of a substance as opals or the tarnish on coal and copper pyrites

iridescent A surface colored like that of nacre (mother of pearl), is usually due to very thin films or strata of air or other materials which cause interference of light rays **1 quartz** A rock crystal filled with fine interstices, containing air films which produce combinations of rainbow colors, used as a gem

iridic Describing a compound of tetravalent iridium **1 bromide** $IrBr_4$ = 512 9 Iridium tetrabromide A hygroscopic brownish powder, or bluish crystals, soluble in water or alcohol **1 chloride** $IrCl_4$ = 334 9 Dark red crystals, soluble in water **1 iodide** IrI_4 = 700 8 Iridium tetraiodide A hygroscopic black powder, soluble in water **1 sulfide** IrS_2 = 257 3 Iridium disulfide A black powder, insoluble in water or acids, soluble in potassium sulfide solution

iridin $C_{24}H_{26}O_{13}$ = 522 3 A glucoside derived from *Iris* species, used as a cholagogue

iridious Iridous

iridium Ir = 193 1 A metallic element atomic number 77, of the platinum family, discovered in 1804 by Tennant A white, hard, brittle lustrous metal, d 22 42, m 1950 soluble in aqua regia Used mainly, as alloys of the noble metals, to coat hydrogen electrodes and to harden platinum for jewelry (10 % Ir), also as catalyst, and with Os, for pen tips and compass bearings

1 compounds Three series valency 2 irido-, as, IrO, $IrCl_2$, valency 3 iridous-, as, Ir_2O_3, $IrCl_3$, valency 4 iridic-, as, IrO_2, $IrCl_4$ **1 sodium chloride** $Na_2IrCl_6{,}12H_2O$ = 691 02 Sodium iridichloride Yellow crystals, m 50

irido A prefix for divalent iridium, Ir<

iridosmine Osmiridium

iridous Describing a compound of trivalent iridium, Ir≡ **1 oxide** Ir_2O_3 = 434 2 Iridium trioxide, iridium black A black powder, slightly soluble in hydrochloric acid, used in ceramics as a pigment

iris (1) An iridescent quartz or other mineral Sometimes used as a gem (2) **Blue flag** The dried rhizome of *I versicolor* or *I caroliana* Used as purgative, emetic or diuretic (3) A genus of plants, Iridaceae, q v

Irish diamond A quartz crystal from Ireland, sometimes used as a gem **I moss** Carrageen, *Chondrus crispus*, killeen The dried thallus of the kelps from the coast of Ireland and North America, used as a demulcent, and as a clarifying agent in brewing

irisin An extract from blue flag or *Iris versicolor*

irisoid The combined principles from blue flag (*Iris versicolor*), used as a cathartic and alterative

irium Trade name for sodium lauryl sulfate, used as detergent

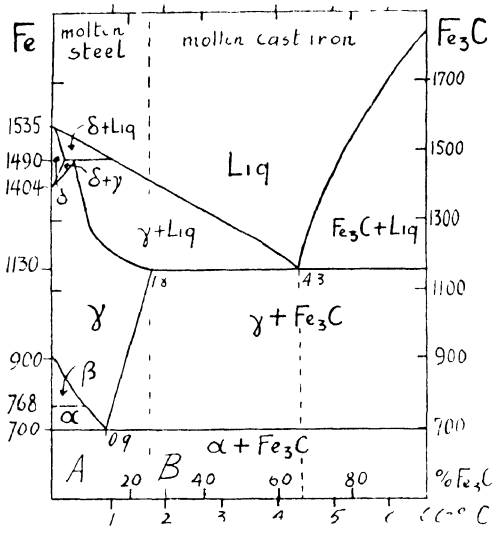
iron Fe = 55 85 Ferrum A metallic element, atomic number 26, in the eighth group of the periodic system A black, lustrous, cubic, magnetic metal, d 7 85, m 1530, b 3200 Iron forms several series of compounds

Valence	In acid solution	In alkaline solution
2	Fe^{++} ferrous (*green*)	$HFeO_2^-$ hypoferrite
3	Fe^{+++} ferric (*brown* or *yellow*)	FeO_2^- ferrite
4	FeO^{++} ferryl	$HFeO_3^-$ hypoferrate
6		FeO_4^{--} ferrate (*purple*)

The many modifications of metallic iron, (wrought cast, steel, reduced) consist chiefly of its allotropes (see figure) The world output of iron excluding steel (q v) in 1941 was 105,000,000 long tons, produced in U S > Germany > U S S R > Gt Britain > Japan > France > Sweden

alibated- I covered with a protective layer of aluminum **cast-** The molten iron from blast furnaces Gray metallic masses, d 7 86, m 1275 to 1505 **ingot-** The malleable i from the Bessemer process **malleable-** Wrought- **meteoric-** q v **native-** Meteorites **passive-** I rendered insoluble in dilute acids by immersion in fuming nitric acid, chloric or perchromic acid, or hydrogen peroxide, or by making it the anode in electrolysis This property is lost by mechanical shock **pig-** Cast- **Quevennes-** Reduced i **reduced-** Finely powdered metallic i obtained by heating ferric oxide in a current of hydrogen **specular-** Specularite **steel-** A gray metal, d 7 7, m 1375

See *steel* **white-** (1) Cast iron containing only combined carbon (2) Marcasite **wrought-** A cast iron which has been heated and hammered A gray metal, d 7 86, m 1505



Iron-carbon system

$\alpha \rightleftharpoons \beta \rightarrow \gamma$
760°C 900°C

Pure iron melts at 1535°, and pure cementite, Fe_3C, containing 6 67 % carbon at 1850°C The different solid solutions and compounds which are formed depend on the carbon content and are α = ferrite, β = beta-iron γ = austenite, δ = delta-iron, Fe_3C = cementite, $\alpha + Fe_3C$ = pearlite During the cooling of molten iron several transformations take place which below a carbon content of 1 8 % are important in the heat treatment of steel and cause, in section *A*, more or less grained crystals of ferrite in pearlite, and in section *B* pearlite in cementite Thus **α-ferrite** The chief constituent of wrought iron, stable below 760°C , is soft and magnetic it dissolves little iron carbide **β-ferrite** A non-magnetic i produced at 760°C , it also dissolves i carbide **γ-ferrite** A non-magnetic i produced at 900°C , it forms solid solutions with i carbide Cf *diagram*

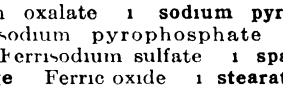
i acetate Ferric acetate **i alginate** Ferric alginate **i alloys** See *steel, ferrimanganese, silicon alloys* **i alum** A native ferripotassium sulfate See *alums* **i albuminate** Ferric albuminate **i ammonium bromide** Ferroammonium bromide **i ammonium chromate** Ferriammonium chromate **i ammonium chloride** Ferriammonium chloride **i ammonium citrate** Ferriammonium citrate **i ammonium cyanide** See *ammonium ferrocyanide, ammonium ferricyanide* **i ammonium oxalate** Ferriammonium oxalate **i ammonium sulfate** (1) Ferroammonium sulfate (2) Ferriammonium sulfate **i ammonium tartrate** Ferriammonium tartrate **i alginate** Ferric alginate **i arsenate** (1) Ferric arsenate (2) Ferrous arsenate **i benzoate** Ferric benzoate **i black** Finely-divided antimony **i brass** A brass containing from 1–9 % iron **i bromide** (1) Ferric bromide (2) Ferrous bromide **i buff** Nanking yellow, or ferric hydroxide **i cacodylate** Ferric cacodylate **i camphorate** Ferric camphorate **i carbide** (1) Fe_3C = 179 52 Regular, gray crystals, d 7 07, insoluble in water (2) FeC_4 = 103 84 A gray crystalline mass See figure **i carbonate** (1) Ferric carbonate (2) Ferrous carbonate **i carbonyl** (1) $Fe(CO)_5$ = 195 84 Iron pentacarbonyl, a pale yellow viscous liquid, freezing at −20, b 102 5, decomp 180 (2) $Fe_2(CO)_9$ = 363 68 Diferrocarbonyl Orange crystals, decomp on heating (3) $Fe(CO)_4$ = 167 84 Iron tetracarbonyl Green crystals **i chloride** (1) Ferric chloride (2) Ferrous chloride **i chromate** Ferric chromate **i citrate** Ferric citrate **i citrate green** Ferriammonium citrate **i cyanides** See *ferric ferricyanide, ferric ferrocyanide, ferrous ferricyanide* and *ferrous ferrocyanide* **i dinitrosothiosulfates** $M[Fe(NO)_2S_2O_3]H_2O$, where M is K or Rb **i disulfide** FeS_2 = 120 0 Yellow rhombic crystals, d 4 86, m 1171, produced by the precipitation of ferric salts with hydrogen sulfide **i flint** An opaque variety of quartz, containing iron **i family** The elements Cr Mn Fe, Co, Ni all of which form colored salts and two or more series of compounds Cf *periodic system* **i fluoride** Ferrous fluoride **i formate** Ferric formate **i. founding** Making a facsimile of a pattern by running molten iron into a sand impression or mold of the pattern **i froth** A fine spongy variety of hematite **i glycerophosphate** Ferric glycerophosphate **i glance** Hematite **i hydroxide** (1) Ferric hydroxide (2) Ferrous hydroxide **i hypophosphite** (1) Ferric hypophosphite (2) Ferrous hypophosphite **i hyposulfite** Ferrous hyposulfite **i iodate** Ferric iodate **i iodide** (1) Ferrous iodide (2) Ferric iodide **i lactate** (1) Ferric lactate (2) Ferrous lactate **i liquor** A solution of ferrous acetate **i magnesium citrate** Ferrimagnesium citrate **i magnesium lactate** Ferromagnesium lactate **i magnesium sulfate** Ferromagnesium sulfate **i malate** Ferric malate **i manganese chloride** Ferromanganous chloride **i manganese citrate** Ferrimanganic citrate **i manganese iodide** Ferromanganous iodide **i manganese lactate** Ferromanganous lactate **i manganese sulfate** Ferromanganous sulfate **i manganese tartrate** Ferrimanganic tartrate **i minerals** Iron is, after aluminum the most abundant metal, and occurs in practically all rocks and a large number of minerals

meteorites	Fe
hematite	Fe_2O_3
magnetite	Fe_3O_4
limonite	$Fe(OH)_3$
pyrite	FeS
marcasite	FeS_2
siderite	$FeCO_3$

i mordant (1) Ferrous sulfate (2) Ferric nitrate **i nitrate** (1) Ferrous nitrate (2) Ferric nitrate **i nitride** Fe_4N A catalyst for the synthesis of ammonia **i nucleinate** Ferric nucleinate **i oleate** (1) Ferric oleate (2) Ferrous oleate **i oxalate** Ferric oxalate **i oxide** (1) FeO, ferrous oxide (2) Fe_2O_3, ferric oxide (3) Fe_3O_4, ferriferrous oxide *black-* Ferric oxide *magnetic-* Ferrous

oxide *red-* Ferric subcarbonate **i paranucleinate** Triferrin **i pentacarbonyl** See *i carbonyl* **i peptonate** Ferric peptonate **i perchlorate** Ferric perchlorate **i perchloride** Ferriferrous chloride **i persulfate** Ferriferrous sulfate **i phenolate** Ferric phenate **i. phosphates** (1) Ferric phosphate (2) Ferrous phosphate **i phosphide** FeP = 86 86 A black powder, d 5 2 There are also Fe_2P, Fe_2P_3, Fe_3P, Fe_3P_4 **i potassium citrate** Ferripotassium citrate **i potassium cyanide** (1) Potassium ferricyanide (2) Potassium ferrocyanide **i potassium oxalate** Ferripotassium oxalate **i potassium tartrate** Ferropotassium tartrate **i protocarbonate** Ferrous carbonate **i protochloride** Ferrous chloride **i protosulfide** Ferrous sulfide **i putty** A mixture of ferric oxide and boiled linseed oil, used for making joints in pipe connections **i pyrite** Pyrites **i pyrophosphate** Ferric pyrophosphate **i pyrosulfate** Ferric pyrosulfate **i pyrothioarsenate** (1) Ferric pyrothioarsenate (2) Ferrous pyrothioarsenate **i quinine citrate** Brown-green, water-soluble scales An official preparation containing 15 % quinine, and not more than 11 % of water **i rhodanate** Ferric thiocyanate **i rust** Hydrated ferric oxide, $2Fe_2O_3,3H_2O$ **i salts** See *ferrous, ferric* **i sesquichloride** Ferric chloride **i sesquioxide** Ferric oxide **i sesquisulfate** Ferric sulfate **i sodium benzoate** Ferrisodium benzoate **i sodium citrate** Ferrisodium citrate **i sodium oxalate** Ferrisodium oxalate **i sodium pyrophosphate** Ferrisodium pyrophosphate **i sodium sulfate** Ferrisodium sulfate **i spar** Siderite **i sponge** Ferric oxide **i stearate** Ferric stearate **i stone** Siderite **i subcarbonate** Ferric subcarbonate **i subsulfate** Ferric subsulfate **i succinate** Ferric succinate **i sulfate** (1) Ferrous sulfate (2) Ferric sulfate **i sulfide** (1) FeS iron monosulfide, see *ferrous sulfide* (2) FeS_2 iron disulfide see *pyrites* (3) Fe_2S_3, iron trisulfide, see *ferric sulfide* (4) Fe_3S_4, iron tetrasulfide, see *ferriferrous sulfide* **i sulfite** Ferrous sulfite **i sulfocyanate** Ferric thiocyanate **i tannate** Ferric tannate **i tantalate** Tantalite **i tartrate** (1) Ferric tartrate (2) Ferrous tartrate **i tersulfate** Ferric sulfate **i thiocyanate** Ferric thiocyanate **i trichloride** Ferric chloride **i trioxide** Ferric oxide **i tungstate** See *ferberite, reinite, wolframite* **i valerianate** Ferric valerianate **i vanadate** Ferric vanadate

irone $C_{14}H_{22}O$ = 206 1 Iron,



A terpene from orris root, and isomer of ionone A colorless liquid, d 0 939, b $_{16mm}$ 144, slightly soluble in water, soluble in alcohol or ether Used in perfumery, for manufacturing violet essence

ironpentacarbonyl See *iron carbonyl*

ironperiod The central part of the third period in the periodic system, consisting of the elements Cr, Mn, Fe, Co, Ni, and Cu All form colored salts and ions, and have two or more series of compounds

irradiation Exposure to ultraviolet radiation, either the small fraction of solar rays not absorbed by the atmosphere or those produced by a mercury vapor lamp The most active rays have a wavelengths of 250–300 mμ Sterols exposed to these rays become active, and exert a vitamin-like effect, *e g* ergosterol exposed for 22 5 seconds to 265 mμ, absorbing a total of $3\ 2 \times 10^{13}$ quanta (which corresponds with $3\ 2 \times 10^{13}$ activated molecules or 2×10^{-3} gram) forms sufficient vitamin D to affect a rat suffering from rickets (Fosbinder, Daniels and Steenbock) I is measured by Eder's solution, q v

irregular Not according to rule

irreversible Describing a reaction which cannot be reversed, and usually proceeds to completion in one direction

irritant (1) An agent which produces inflammation or irritation, as, mustard oil, cantharides, croton oil, phenol Cf *lacrimatory gases* (2) The metals Ni, Mn, Cr, W and Si, which in iron alloys are i to carbon

Irvine, Sir James Colquhoun 1887– A British chemist noted for research on carbohydrates

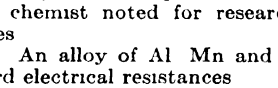
isabellin An alloy of Al Mn and Cu, used for standard electrical resistances

isaconic acid Itaconic acid

isaconitic acid $C_6H_6O_6$ = 174 0 Isoaconitic acid The tribasic acid HOOC CH CH CH $(COOH)_2$

isamatic Isamic

isamic acid $C_{16}H_{13}N_3O_4$ = 311 1 Red prisms m 164 5



slightly soluble in water, obtained from isatin

isanic acid $C_{14}H_{26}O_2$ = 220 15 The fatty acid, $C_{13}H_{19}COOH$ Colorless crystals, m 41, from the oil of tsano nuts

isaphenic acid $C_{17}H_{11}NO_3$ = 277 1 White leaflets m 295 insoluble in benzene or chloroform, soluble in acetic acid

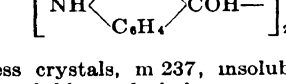
isapiol An isomer of apiol, $C_{12}H_{14}O_4$

isarol Ammonium sulfoichthyolate obtained by distilling bituminous slate, sulfiting the distillate and combining it with ammonia It forms a dark-brown sticky liquid, soluble in water and used as an antiseptic, analgesic, and antipuretic

isatan $C_{16}H_{12}O_3N_2$ = 280 11 Hydroxybioxindol

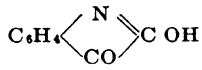
isatic acid $C_8H_7NO_3$ = 165 1 Isatinic acid aminophenylglyoxylic acid, amidobenzoyl formic acid $NH_2\ C_6H_4CO\ COOH$ A white powder, decomp on heating, slightly soluble in water or alcohol

isatide $C_{16}H_{12}N_2O_4$ = 296 11 Dihydroxybioxindol, isatin-*3 3'*-pinacol

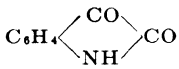


Colorless crystals, m 237, insoluble in water, slightly soluble in alcohol

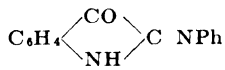
isatin $C_8H_5O_2N$ = 147 1 2-hydroxy-3-pseudoindolone, pseudoindogen oxide, o-aminobenzoylformic acid, lactam of isatinic acid



Red needles, m 198, soluble in hot water or alcohol, used in the manufacture of dyestuffs **β-imino-** Imesatin **pseudo-** Indoldione The lactim form of isatin

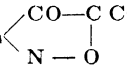


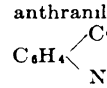
1 anilide $C_{14}H_{10}N_2$ = 222 17

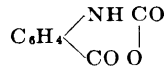


m 120 **1 chloride** C_8H_4ONCl = 165 5 Brown needles, decomp 180, insoluble in water, soluble in alcohol, used in the manufacture of dyestuffs

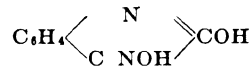
isatinic acid Isatic acid

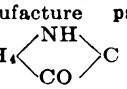
isatogenic acid $C_9H_5O_4N$ = 191 05 The bicyclic compound C_6H_4  Cf *diisatogen*

isatoic acid $C_8H_7NO_4$ = 181 09 *N*-carboxyanthranilic acid anthranyl carboxylic acid C_6H_4  **1 anhydride** $C_8H_5NO_3$ = 163 09 Benzoxazinedione



isatoxime $C_8H_6O_2N_2$ = 162 1 Nitrosoindoxyl The bicyclic compound

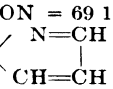


Yellow needles, m 202 (decomp), slightly soluble in water, soluble in alcohol, ether, or bases, used in dyestuff manufacture **pseudo-** The bicyclic compound C_6H_4 

Yellow crystals, m 200

isatropic acid $C_{18}H_{16}O_4$ = 296 12 *1 2 3 4*-Tetrahydro-*1*-phenyl-*1 4*-naphthalene dicarboxylic acid A solid, m 237, insoluble in ether, soluble in water or alcohol Cf *atropic acid*

isatropylcocaine $C_{19}H_{22}O_4N$ = 328 3 An alkaloid derived from coca leaves

isazol C_3H_3ON = 69 1 The heteroatomic pentacycle  An isomer of oxazole

ischidrotic An agent that causes retention or suppression of perspiration

isentropic Involving no change in entropy

iserite A sand rich in titanium and iron

isethionic acid $C_2H_6O_4S$ = 126 1 Ethylenehydrinsulfonic acid, oxyethylsulfonic acid, *2*-hydroxyethane sulfonic acid The hydroxy acid, $CH_2OH\ CH_2\ SO_2OH$, from which taurine is derived A syrupy liquid With oleic acid it forms detergents, igepons

ishkyldite $H_{20}Mg_{15}Si_{11}O_{47}$ A structural variety of chrysotile found in the Volga district

isindazole Isoindazole

isinglass (1) Fish glue, ichthyocolla A pure gelatin derived from the swimming bladders of fishes (*Acipenser* species), used as an adhesive and clarifying agent (*2*) Mica in thin sheets used for windows in ovens and in asbestos goggles **Japanese-** Agar **vegetable-** Agar

Isle of Wight diamond A quartz crystal from the Isle of Wight, sometimes used as a gem

Isle Royal greenstone Chlorastrolite

iso- A prefix derived from the Greek "equal" which indicates a similarity In organic compounds it is generally abbreviated to *i-*, listed under the corresponding normal compound Cf *isomery*

isoaconitic Isaconitic

isoallyl Propenyl

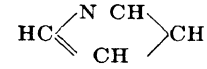
isoamoxy The monovalent radical, $Me\ CH(CH_2)_2O$ —

isoamyl The radical $Me_2CH\ CH_2\ CH_2$— See *i-amyl*

isoamylene Pental

isoanthraflavic acid $C_{14}H_8O_4$ = 240 13 2 7-dihydroxyanthraquinone A yellow crystalline solid m 330, soluble in alcohol, insoluble in water

isoazole C_4H_5N = 67 1 Isopyrrole The pentatomic heterocyclic compound



isobar (1) A line drawn through points of a map or chart which have the same barometric pressure at a given time (2) Any one of a set of isobars, q v

isobaric Pertaining to atoms having the same weight Cf *isobars* **1 isotopes** Those atomic species which have the same atomic weights and the same atomic numbers Cf *isobars isotopes*

isobars (1) Any two or more atomic species having the same atomic weight, they may or may not have the same atomic number (*2*) A line in a diagram or map showing equal barometric pressures

TABLE OF ISOBARS

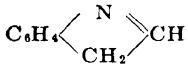
A Having different atomic numbers

At	Weight 40	18-A, and 20-Ca
At	Weight 70	30-Zn and 42-Ge
At	Weight 74	32-Ge and 24-Se
At	Weight 78	34-Se and 36-Kr
At	Weight 80	34-Se and 36-Kr
At	Weight 82	34-Se and 36-Kr
At	Weight 86	36-Kr and 38-Sr
At	Weight 112	48-Cd and 50-Sn
At	Weight 114	48-Cd and 50-Sn
At	Weight 115	49-In and 50-Sn
At	Weight 116	48-Cd and 50-Sn
At	Weight 121	50-Sn and 51-Sb
At	Weight 124	50-Sn and 54-Xe
At	Weight 126	52-Te and 54-Xe
At	Weight 128	52-Te and 54-Xe
At	Weight 130	52-Te and 54-Xe
At	Weight 136	54-Xe and 56-Ba
At	Weight 142	58-Ce and 60-Nd
At	Weight 206	81-ActC″, 82-ActPb, and RaG
At	Weight 208	81-ThC″ and 82-ThD
At	Weight 210	81-RaC″, 82-ActB, 82-RaD, 83-ActC, 83-RaE, 84-RaF, and 84-ActC′
At	Weight 212	82-ThB, 83-ThC, and 84-ThC′

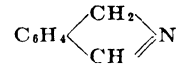
At Weight 214 82-RaB, 83-RaC, 84-RaC′, and 84-ActA
At Weight 218 84-RaA and 86-ActEm
At Weight 222 86-Rn and 88-ActX
At Weight 226 88-Ra, 89-Act, and 90-RaAc
At Weight 228 88-MsThI, 89-MsThII, and 90-RaTh
At Weight 230 90-Io, 90-Uy, and 91-Pa
At Weight 234 90-Ux_1, 91-Ux_2, 91-Uz, and 92-UII

B Having the same atomic number (isobaric isotopes)
At Wt 206, At No 82 Act Pb, RaG
At Wt 210, At No 82 Act B, RaD
At No 83 Act C, RaE
At No 84 RaF, ActC′, etc

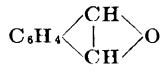
isobenzazole. C_8H_7N = 117 1 **1-** Indolenine, ψ-indole



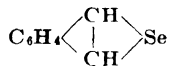
2-ψ-isoindole



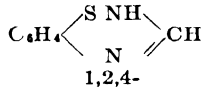
isobenzofuran C_8H_6O = 118 1 Isocoumarone



dihydroketo- Phthalide 1 **dione** Phthalic anhydride
isobenzofurandione Phthalic anhydride
isobenzofuranone Phthalide
isobenzoselenofuran C_8H_6Se = 181 2

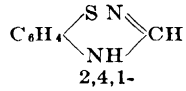


isobenzothiodiazine The heterocyclic compounds



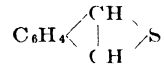
1,2,4-

or

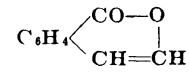


2,4,1-

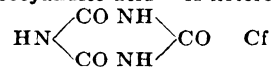
isobenzothiofuran C_8H_6S = 134 1



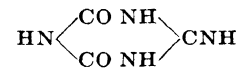
isobutane See *i-butane*
isobutenyl The monovalent radical $Me_2C{=}CH{-}$, from i-butylene
isobutoxy The monovalent radical Me CH-CH O—, from i-butyl alcohol
isobutyl The monovalent radical $Me_2CH{-}CH_2{-}$, from i-butane
isobutyryl The monovalent radical, Me C CH-C O—, from i-butyric acid
isocarb A line in a diagram showing equal carbon contents
iso-catalysis See isomeric *catalysis*
isocetic acid Pentadecanoic acid *
isocholine Amantine (2)
isochore The curve obtained by plotting the pressure and temperature of a gas at constant volume See *reaction* isochore
isochromatic Having the same color throughout
isochrone A line joining points of equal stability (expressed as log gelation time) on triangular diagrams, used to express the stability of colloids
isochronism The characteristic of (1) occurring at the same intervals of time, (2) lasting for equal periods of time
isochronous Occurring in the same period of time at equal intervals
isocorybulbine $C_{21}H_{21}O_4N$ = 351 3 An alkaloid from *Corydalis cava*
isocoumarin $C_9H_6O_2$ = 146 1



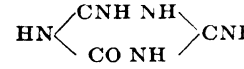
isocrotonic acid $C_4H_6O_2$ = 86 046 *cis-α*-butenic acid, *β*-crotonic acid, q v A colorless liquid, d 1 0252, m 14 6, decomp 171
isocyanate Carbimide A compound containing the monovalent —N=C=O radical
isocyanide Isonitrile, carbylamine A compound containing the monovalent —N=C or —N≡C radical
isocyanin A member of a group of dyes used as photographic sensitizers Cf *carbocyanin*
isocyano The monovalent radical, C N—, or C N— Cf *isocyanide*
isocyanuric acid A heterocyclic ring compound



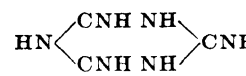
Cf *cyanuric acid*
isocyanurimide The heterocyclic ring compounds
$C_3H_4O_2N_4$ = 128 05 **monoimide** or melanuric acid,



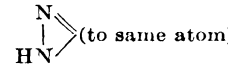
$C_3H_3ON_5$ = 127 08 **diimide** or isoammelidic acid,



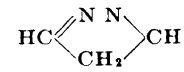
$C_3H_6N_6$ = 126 09 **triimide** or isomelamine,



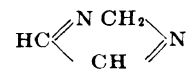
isocyclic (1) Describing a closed chain compound containing the same number of atoms as the compound with which it is isocyclic, *e g*, the benzene ring (6 carbon atoms) is isocyclic with the pyridine ring (5 carbon atoms and 1 nitrogen atom) (2) Sometimes incorrectly used for homocyclic
isodiazo The trivalent radical,



isodiazole $C_3H_4N_2$ = 68 2 **1 2-** Isopyrazol The pentacyclic compound



1 3- Isoimidazol The pentacyclic compound



isodigitoxigenin $C_{23}H_{34}O_4$ = 374 2 Lustrous, white crystals, m 271, from digitalis

isodimorphism Isomorphs which have two crystalline forms in common Cf (*isomorphism*)

isodisperse Dispersable in solutions having the same pH value

isodulcite Rhamnose

isodurene $C_{10}H_{14}$ = 134 11 *1 2 3 5*-Tetramethyl benzene, $C_6H_2Me_4$ A colorless liquid, d 0 896 m −24 b 197 **amino-** Isoduridine

isodurenol $C_{10}H_{14}O$ = 150 1 *2 3 4 6*-Tetramethyl phenol, C_6HMe_4OH White crystals, m 80, b 240

isoduridine $C_{10}H_{15}N$ = 149 13 *2 3 4 6*-Tetramethyl aniline $Me_4C_6H\ NH_2$ White crystals, d 0 978, m 23, b 255

isodurylic acid $C_{10}H_{12}O_2$ = 164 09 Trimethylbenzoic acid **α-** or *3 4 5*- Needles, m 215 **β-** or *2 4 6*- White scales, m 152 **γ-** or *2 3 5*- White plates, m 147, all are very slightly soluble in water

isodynamic (1) Having equal force (2) Generating or liberating the same amount of energy (expressed in calories), *e g*, a group of isodynamic food materials

isoelectric point The point of electric neutrality or zero potential, hence the *p*H value at which a substance (protein, etc) is neutral Below or above this *p*H-value it acts either as a base or acid, respectively In the case of colloids, coagulation occurs at or near this hydrogen ion concentration Cf *gelation*, *casein* Typical values

pH	*Protein*
4 4	serum globulin
4 6	ovalbumin
4 7	gelatin, casein, serum albumin
5 3	fibrinogen
5 5	edestin serum albumin pseudo globulin
6 8	hemoglobin, oxyhemoglobin
8 1	globin

isoelectronic Describing atoms which resemble one another in all but mass and nuclear charge The spectra of such atoms are thus simply related Cf *isostere*, *ionic number*

isoerucic acid Brassidic acid

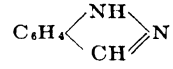
isoferulic acid Hesperitinic acid

isogamous Having male and female gametes which are morphologically identical

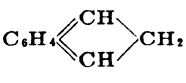
isohexane See *i-hexane*

isohydric Describing a neutralization, during which the pH value does not change Cf *buffer* Hence a set of solutions of similar H^+ concentration **homo-** See *homoisohydric*

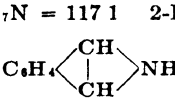
isoindazole $C_7H_6N_2$ = 117 1 1 2-benzodiazole, benzopyrazole



isoindene C_9H_8 = 116 1 The hydrocarbon



isoindole C_8H_7N = 117 1 2-Benzazole



dihydro- Xylenimine **pseudo-** *2*-Isobenzazole

1 dione Phthalimide

isoindoledione Phthalimide

isoindyl The monovalent radical, C_8H_6N—, derived from isoindole There are four isomers

isokom A line drawn through a diagram to connect points of equal viscosity

isolate To separate or prepare an element or a compound in a pure condition

isoleucine $C_6H_{13}NO_2$ = 131 11 *β*-methylethyl-*α*-aminopropionic acid, *2*-amino-*3*-methylpentanoic acid* The amino acid $NH_2\ CH(CHEtMe)COOH$ *dl-* Rhombic or monoclinic plates, m 292, slightly soluble in water *d-* Greasy leaflets, m 283

isoleucyl The monovalent radical, $MeCH_2\ CHMe\ CHNH_2\ CO$—

isologue, isolog A member of a series of compounds of similar structure, but having different atoms of the same valency and usually of the same periodic group

isologous series A set of isologs, *e g*, the pentacyclic compounds fall into three isologous types, namely

furan type, as C_4H_4O, C_4H_4S, C_4H_4Se
pyrrole type, as C_4H_5N, C_4H_5P, C_4H_5As
pentamethylene type, as C_5H_8, C_4H_8Si

Other examples of isologous series are

Water H_2O, M_2O R_2O, M_2S, M_2Se, M_2Te
Ammonia NH_3, NR_3, PR_3, AsR_3, BiR_3
Hydroxylamine R_2NOH, R_2POH, R_2IOH, R_2TlOH
Methane CH_4, CR_4, SiR_4, SnR_4, PbR_4
Carbinol $R_3C\ OH$, R_3SiOH, R_3SnOH, R_3SOH
Ammonium hydroxide R_4NOH, R_4POH, R_4AsOH, R_4WOH
Formaldehyde H_2CO, R_2CO, R_2SiO, R_2SO R_2TeO
Formic acid $H\ CO\ OH$ $R\ CO\ OH$, $R\ SiO\ OH$ $R\ SO\ OH$, $R\ SnO\ OH$

isomalic acid See *malic acid*

isomer One of a pair of or more compounds having the same composition, but different properties Cf See *metamers*, *dimers*, *polymers*

isomeric Pertaining to isomerism

isomeride One of a set of compounds which have similar structural groups but not necessarily the same number of atoms, thus, anabasine is an *isomer* of nicotine, but normicotine is an *isomeride*

isomerism The phenomenon shown by a compound which has the same percentage composition as another compound, yet differs in the relative position of the atoms within the molecule, from which result different physical and chemical properties There are three types of simple isomerisms

(a) Structural isomerism, as, *chain*-isomerism (propane and isopropane), *place* isomerism (1-chloropropane and 2-chloropropane), *meta*-isomerism (Δ^1-butylene and Δ^2-butylene), *ring*-isomerism (o-, m-, p-, v-, s-, and a-position)

(b) Geometrical isomerism, as, *cis-trans*-isomerism, *syn-anti*-isomerism

(c) Stereo-isomerism or isomerism due to the presence of an asymmetric carbon atom which gives optically active d-, and l-compounds **dynamic-** Tautomerism

isomery Isometry The general phenomena of isomerism, tautomerism, and pseudomerism of organic compounds See *coordination theory* and *Werner's theory* Four factors determine the types of isomery, namely

P = the position, or arrangement of the atom within the molecule
T = the type of the resulting compound
V = the valency of the principal atom

L = the linkage or connection between the atoms

Accordingly an organic molecule may show the following differences, (d), or similarities, (—)

P	T	V	L	
d	—	—	—	= isomerism and stereoisomerism
d	d	—	—	= metamerism } dynamic
—	d	—	d	= desmotropism } isomerism
d	d	—	d	= tautomerism }
—	—	d	—	= pseudomerism

Classification and examples

1 Isomerism

(a) structural isomerism

$CH_3 CH_2 CH_2 CH_3$ and $(CH_3)_2CH\,CH_3$

nuclear or chain-isomerism

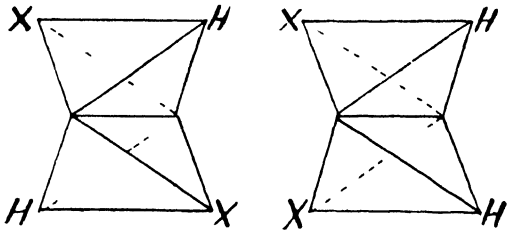
$CH_3 CH_2 CH_2Cl$ and $CH_3CHCl\,CH_3$

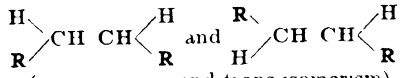
position or place-isomerism

$CH_3 CH_2 CH{=}CH_2$ and $CH_3 CH{=}CH{-}CH_3$

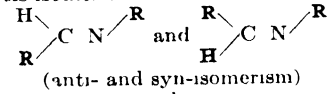
metamerism or meta-isomerism

(b) geometrical isomerism



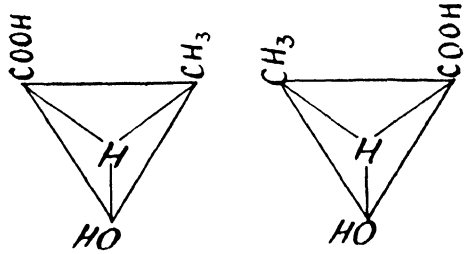


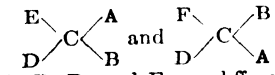
(cis-isomerism and trans-isomerism)



(anti- and syn-isomerism)

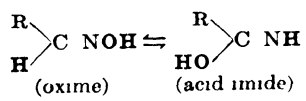
(c) stereo- or optical-isomerism



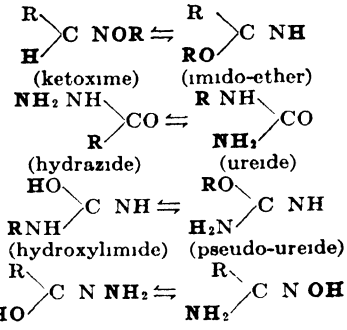


(A, B, D, and E are different atoms or radicals)

2 Metamerism The type of compound and the position of the atoms change, but the linkage and valency remain the same



(oxime) (acid imide)



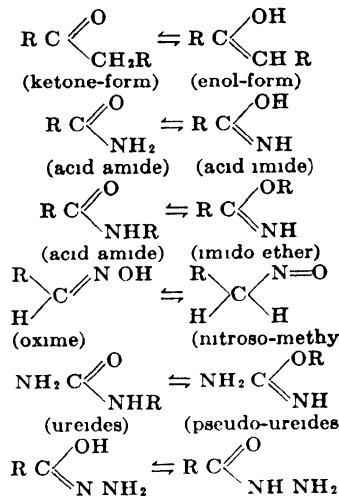
(ketoxime) (imido-ether)

(hydrazide) (ureide)

(hydroxylimide) (pseudo-ureide)

(hydrazonic acid) (amidoximes)

3 Desmotropism Linkage of atoms and type of compound change, but position and valency remain the same



(ketone-form) (enol-form)

(acid amide) (acid imide)

(acid amide) (imido ether)

(oxime) (nitroso-methyl-)

(ureides) (pseudo-ureides)

(hydrazonic acid) (acid hydrazide)

4 Tautomerism Linkage and position of atoms, as well as the type of compound changes, but valency remains the same

$R\,O\,N\,O \rightleftharpoons R\,NO_2$

(nitrite) (nitro-compound)

$R\,O\,C\,N \rightleftharpoons R\,N\,C\,O$

(cyanate) (tauto-cyanate)

$R\,O\,N\,C \rightleftharpoons R\,C\,N\,O$

(fulminate) (iso-cyanate)

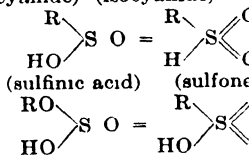
5 Pseudomerism The valency of one atom changes

$R\,OC\,N$ $R\,C\,N\,O$

(cyanate) (isocyanate)

$R\,C\,N = R\,N\,C$

(cyanide) (isocyanide)



(sulfinic acid) (sulfones)

(R-sulfite) (sulfonic acid)

$NH_4\,OCN = NH_2\,CO\,NH_2$

(ammonium carbamate) (urea)

6 Coordination isomerism The different arrangement of radicals around the two nuclei in combination, as,

$[Cr(NH_3)_6]\,[Cr(SCN)_6]$ and $[Cr(NH_3)_4(SCN)_2]\,[Cr(NH_3)_2(SCN)_4]$

7 Hydration isomerism The formation of aquo compounds from ionisable halides in the nucleus, as,

$$\begin{bmatrix} H_2O & & H_2O \\ H_2O & Cr & H_2O \\ H_2O & & Cl \end{bmatrix} Cl_2\,H_2O$$

and

$$\begin{bmatrix} H_2O & & H_2O \\ H_2O & Cr & Cl \\ H_2O & & Cl \end{bmatrix} Cl\,2H_2O$$

8 Coordination polymerism, as, $[Cr(NH_3)_3(SCN)_3]$ and $[Cr(NH_3)_5(SCN)_3]_3\,[Cr(SCN)_6]_2$, its polymer

isometric Of the same dimension 1-crystal See *crystal systems*

isometry Isometry

isomorph One of a set of similarly-shaped crystals, having different compositions, *e g*, Na_2SO_4 Na_2SeO_4

isomorphic Pertaining to similar crystalline forms

isomorphism The crystallization of different compounds in the same form These elements and radicals can replace one other without causing any essential alteration in crystalline form On this basis the elements are classified into eleven groups of *isomorphs*, q v

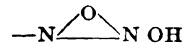
isomorphous mixture A mixture of isomorphs usually found in minerals and represented in the formula in parenthesis, as, $(Fe,Mn)CO_3$, which indicates that Mn and Fe are interchangeable and behave as the equivalent weight of either element

isomorphs The elements arranged in the order of periodic groups and according to their isomorphism

1 Cl, Br, I, F, Mn, as $KMnO_4$ and $KClO_4$
2 S, Se, Te, as sulfides and tellurides, Cr, Mn, Te, as K_2RO_4, As, Sb, as MR_2 (glances)
3 As, Sb, Bi, Te (as element), P, V, (in salts), N, P (in organic compounds)
4 K, Na, Rb, Cs, Li, Tl, Ag
5 Ca, Sr, Ba, Pb, Fe, Mn, Zn, Mg, Ni, Co, Cu, Ce, La, Pr, Nd, Er, Y, with Ca, Cu, Hg, with Pb Cd, Be, In, with Zn, Tl, with Pb
6 Al, Fe, Cr, Mn, Ce, U, in oxides M_2O_3
7 Cu, Ag (as monovalent compounds), Au
8 Pt, Ir, Pd, Rh, Ru Os, Au, Fe, Ni, Sn, Te
9 Cd, Si, Ti, Zr Th Sn, Fe, Ti
10 Ta, Nb
11 Cr, Mo W

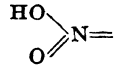
On the basis that 1 have similar formulas in their compounds some atomic weights (as, of vanadium) have been determined Cf *isodimorphism*

isonitramine The monovalent radical,



isonitrile* Isocyanide

isonitro The divalent group



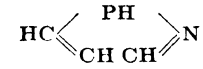
Cf *acinitro compound*

isonitroso Oximido The divalent group $>N\,OH$

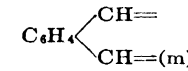
isontic Being equal Applied or relating to any line or surface points that are equal in some respects, as, isobar, isotherm

isopentane See *i-pentane*

isophophazol $C_3H_4NP = 85\,1$ The heterocyclic compound



isophthalal The tetravalent group



isophthalidene Isophthalal

isopral $C_3H_5OCl_3 = 163\,44$ Trichloro-i-propanol, $CCl_3\,CMeH\,OH$ White prisms, m 49, soluble in water, alcohol or ether, a hypnotic

isoprene $C_5H_8 = 68\,1$ 2-methylbutadiene (1,3) $CH_2\,CMe\,CH\,CH_2$ A distillation-product of india rubber, d 0 679, m −120, b 34 It is the unit structure of terpenes, carotenoids, phytol and rubber Cf *duprene* **di-** The geraniol and linalool chain **tri-** The farnesol and nerolidol chain Cf *vinyl compounds*

isopropanol $C_3H_8O = 60\,1$ Isopropyl alcohol, 1-methyl ethanol, $Me_2CH\,OH$ A colorless liquid, d 0 780, b 82, soluble in water, alcohol or ether, used as germicide, denaturant and in perfumery

isopropenyl The monovalent radical, CH_2 - CMe— from isoprene

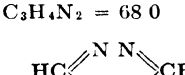
isopropoxy The monovalent radical, $Me_2CH\,O$— from i-propyl-alcohol

isopropyl The monovalent radical, Me_2CH— From i-propane 1 **alcohol** Isopropanol 1 **benzene** Cumene 1 **carbinol** Butanol-2 1 **ether** $C_6H_{14}O = 102\,11$ $(Me\,CH)_2O$ Colorless liquid d 0 7247, b 68 7, used as solvent for waxes, fats and resins 1 **metacresol** Thymol 1 **toluene** Cymene

isopropylidene The bivalent radical, $Me_2C=$ from i-propane

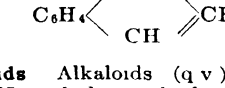
isopyknoscopy Determination of the end-point of a volumetric reaction from the specific gravity of the solution containing the reactants Cf *pyknometer*

isopyrazole $C_3H_4N_2 = 68\,0$ 1,2-isodiazole



isopyre An impure variety of opal, sometimes used as a gem

isoquinoline $C_9H_7N = 129\,1$ Leucoline, 2-benzazine

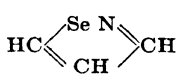


1 **alkaloids** Alkaloids (q v) derived from 1-benzyl-N-methyl-tetra-hydroisoquinoline, *e g*, those of the papaverine, corydine, corydaline, morphine, dicentrine, hydrastine, cryptopine, berberine and protopine groups

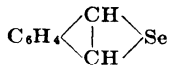
isorhamnetin A glucoside from the pollen of ragweed and bulrush

isorheic A set of liquids which have equal viscosity or fluidity Compare *rhe*

isoselenoazol C_3H_3NSe = 132 3 The pentacyclic compound



isoselenonaphthene C_8H_6Se = 181 0 The heterocyclic compound



isosmotic Isotonic, having the same osmotic pressure

isostere One of 2 or more atoms or atomic groups having an analogous arrangement of electrons and similar physical properties Thus
(a) molecules CO_2 and N_2O in which the electrons are arranged in two octets

O C O and N O N

(b) ions or radicals NO_3^- and CO_3^{--} where the electrons form the octets

O
O X O

(c) atoms and ions Na and Mg+ with one electron, Ne, Na+ and Mg++ with no electron in the valence shell Cf *ionic number, isoelectronic*

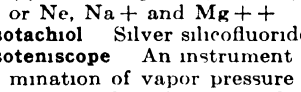
isosteric Pertaining to similar electronic arrangements 1 **properties** The physical properties due to electronic arrangements, see *isosterism*

isosterism A similarity in the physical properties of elements, ions, or compounds due to similar electron arrangements *E g*, *isosteres* have
(a) similar crystalline form, as $NaNO_3$ and $MgCO_3$
(b) similar boiling point, etc , as N_2 and CO, or CO_2 and N_2O
(c) similar spectra, as, Na, Mg+ and Al++, or Ne, Na+ and Mg++

isotachiol Silver silicofluoride

isoteniscope An instrument for the static determination of vapor pressure from the change in level of a liquid in a U-tube

isotetrazole CH_2N_4 = 70 3 The pentatomic compound



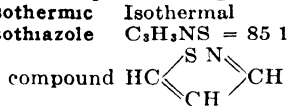
isotherm An expression of equal temperature for a number of points, systems, or phases Cf *reaction isotherm*

isothermal Having a uniform or constant temperature 1 **change** The change of volume of a gas which takes place under such conditions that the temperature remains constant Cf *adiabatic* Thus any heat gained passes out of the system 1 **line** Isotherm

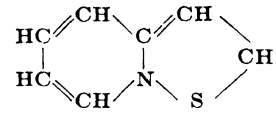
isothermals A group of curves which pass through regions having the same temperature at a given time, as, on a climatic chart or a volume-pressure diagram See figure

isothermic Isothermal

isothiazole C_3H_3NS = 85 1 The pentacyclic compound



isothiazolopyridine C_7H_7NS = 137 1



isothiocyanate Sulfocarbimide A compound of the type R SNC Cf *mustard oil*

isothyanic acid HSNC = 59 1 Sulfocarbimide HS N≡C It yields isothiocyanates

isothiocyano The monovalent radical, —N C S

isotoma The dried herb *Isotoma longiflora*, a Lobeliaceae of the East and West Indies

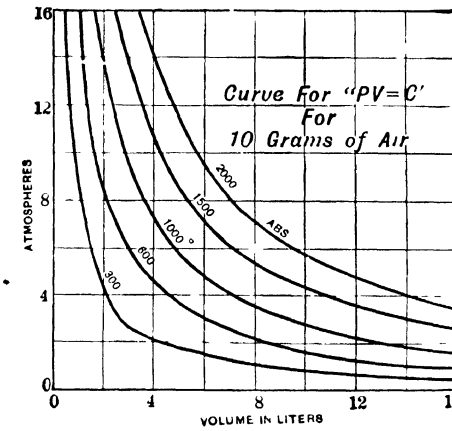
isotomine An alkaloid from isotoma

isotonic (1) Isosmotic (2) Describing a solution which has the same osmotic pressure as blood serum Cf *hypertonic, hypotonic* 1 **salt solution** Normal *saline* 1 **water** A natural water the sum of its mineral constituents amounts to about 300 millimols per liter, which corresponds with an osmotic pressure of 7 7 atm , and a freezing point depression of −0 57°C If lower, the water is *hypotonic*, if higher, *hypertonic*

isotope Any one of a number of atomic species differing in atomic weight, but having the same atomic number (1) Originally it indicated radioactive disintegration-products which occupied an identical place in the periodic system, thus the isotopes of lead (atomic number 82) and their weights are

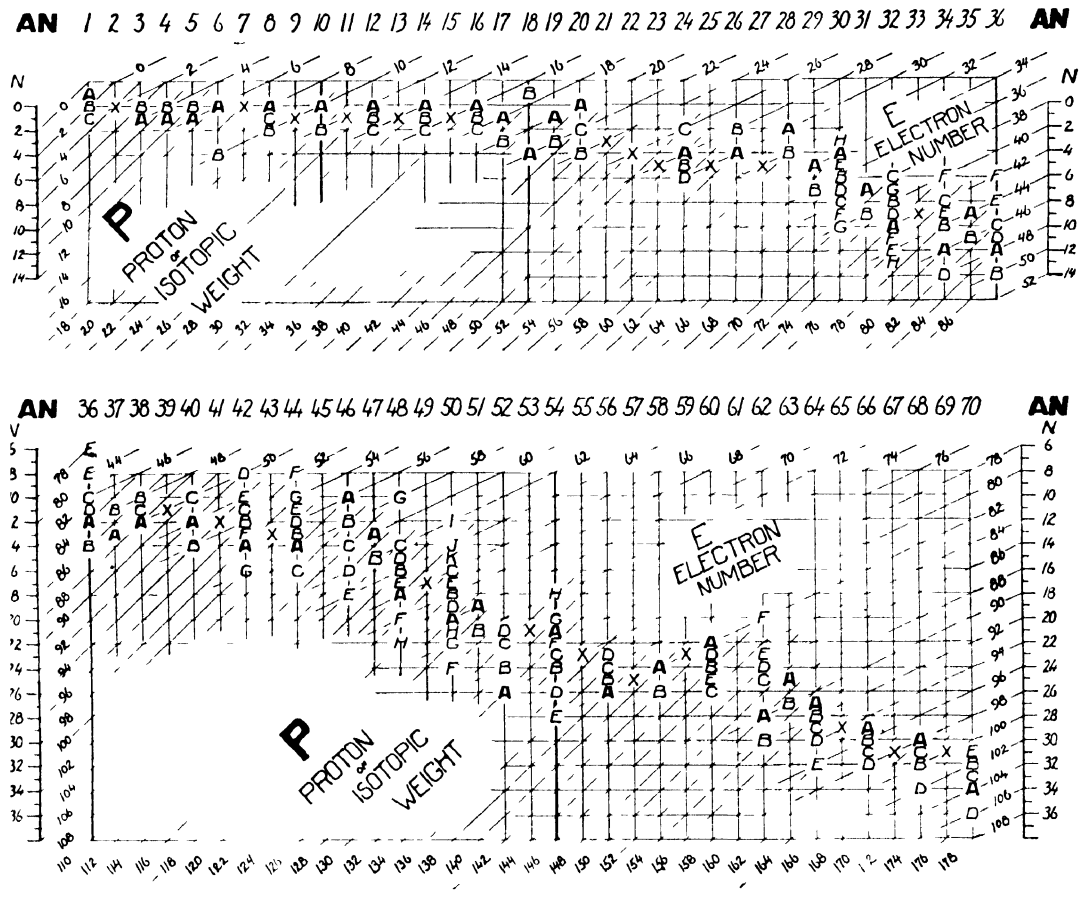
lead from actinium	206
lead from radium	206
lead from thorium	208
actinium B	210
radium D	210
thorium B	212
radium B	214

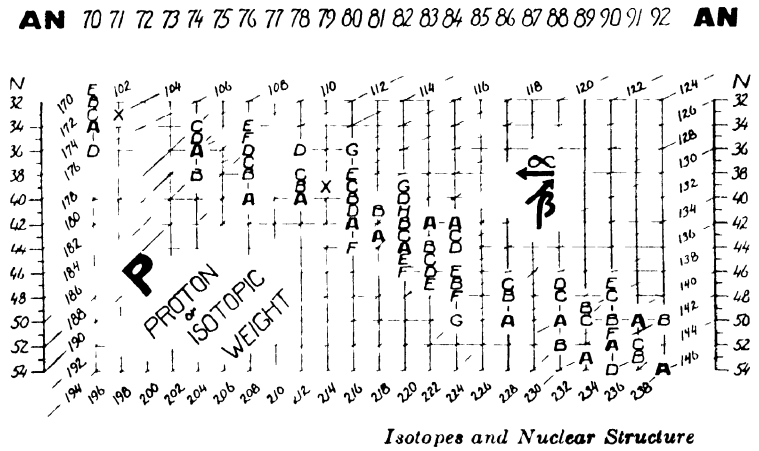
(2) The term now applies to all other elements which consist of two or more atomic species as



Isothermals

revealed by their high-frequency or mass spectra, *e g*, chlorine as we know it is made up of the isotopes Cl^{35} and Cl^{37}, and its atomic weight of 35 5 is the resultant of the isotopic weights 35 and 37 I are determined from (a) mass spectrum, q v or (b) the band heads of molecular spectra **heterobaric-** I of different atomic





The order of abundance of isotopes is shown by the letters A, B C, etc X indicates that no isotopes are known

Nuclear composition is shown by

AN = atomic number or number of positive charges

P = isotopic weight or number of protons

E = electron number or number of negative charges

N = neutron number or number of neutrons

The following relations exist

$AN = P - E$ and

$N = P - 2AN$

ISOTOPES

Atomic number		*Isotopic weight**
1	hydrogen	1, 2 (3)
3	lithium	7, 6
4	beryllium	9, 8
5	boron	11, 10
6	carbon	12 13
7	nitrogen	14, 15 (16)
8	oxygen	16, 18, 17
10	neon	20, 22, 21
12	magnesium	24, 25, 26
14	silicon	28 29, 30
16	sulfur	32, 33, 34
17	chlorine	35, 37
18	argon	40, 36
19	potassium	39, 41
20	calcium	40, 44, 42
22	titanium	48, 50
24	chromium	52, 53, 50, 54
26	iron	56, 54
28	nickel	58, 60
29	copper	63, 65
30	zinc	64, 66, 68, 69, 65, 70 63
31	gallium	69, 71
32	germanium	74, 72, 70, 73, 75, 76, 71, 77
34	selenium	80, 78, 76, 82, 77, 74
35	bromine	79, 81
36	krypton	84, 86, 82, 83, 80 78
37	rubidium	87, 85
38	strontium	88, 86, 87
40	zirconium	90, 94, 92, 96
42	molybdenum	90, 96, 95, 92, 94, 97, 100
44	ruthenium	102, 101, 104, 100, 99, 96, 98
46	palladium°	102, 104, 106, 108, 110
47	silver	107, 109
48	cadmium	114, 112, 110, 113, 111, 116
50	tin	120, 118, 116, 124, 119, 117, 122, 121, 112, 114 115
51	antimony	121, 123
52	tellurium	130, 128, 126
54	xenon	129, 132, 131, 134, 136 128, 130
56	barium	138 137, 136, 135
58	cerium	140, 142
60	neodymium	142, 144, 146
62	samarium	152, 154, 149, 148 147, 144
63	europium	151 153
64	gadolinium°	155, 156, 157, 158, 160
66	dysprosium	161, 162, 163, 164
68	erbium	166, 168, 167, 170
70	yttrium	174, 172, 173, 176, 171
74	tungsten	184, 186, 182, 183
76	osmium	192, 190, 189, 188, 186 187
78	platinum	196, 195, 194, 192
80	mercury	202, 200, 199, 198, 201, 204, 196
82	lead	208, 206, 207, 204, 209, 210, 203, 205

81–92 See radioactive series

*Arranged in the order of the intensities of the mass-spectrum line which indicates the order of abundance Those in parenthesis are uncertain, ° indicates order unknown See figure, also

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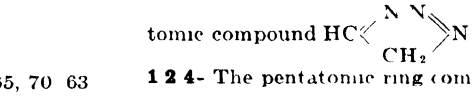
weights as, the products of different disintegration series Cf *radioactive elements* **isobaric-I** of the same atomic weight, produced by expulsion successively of an alpha- and a beta-particle in a different order, as RaD and RaC· Cf *heterotopes, isobars, packing fraction*

isotopic Pertaining to an element which occurs as more than one atomic species **1 number** The number, N, which probably indicates the number of neutrons in the atomic nucleus N = (AW) − 2(AN) or IW − 2(AN) where AW is the atomic weight, IW the isotopic weight and AN the atomic number **1 reaction** Chemical change which involves isotopes, as,

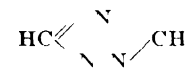
$$H^1H^2O + NH^1_3 \leftrightharpoons H^1_2O + NH^1_2H^2$$

1 weight I W The atomic weight of an isotope This was considered to be an integer, but more accurate measurements with the mass spectrograph indicate small deviations from whole numbers See *packing fraction*

isotriazole $C_2H_3N_3$ = 69 2 **1 2 3-** The pentatomic compound



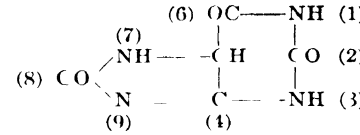
1 2 4- The pentatomic ring compound



isotropic Having similar properties in every direction Cf *anisotropic*

isourea Pseudo-*urea*

isouric acid (1 3 7)-purine-2 6 8-trione



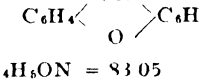
isovaleric acid See *i-valeric acid* **amino-** Valine

isovaleryl The monovalent radical, $Me_2CH\text{-}CH_2CO$— from i-valeric acid

isovaline $C_5H_{11}O_2N$ = 117 09 Amino-i-valeric acid, α-amino-α-methyl butyric acid An amino acid (q v), m 317

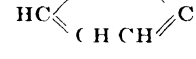
isovanillin $C_8H_8O_3$ = 152 1 3-hydroxy-4-methoxybenzaldehyde 3-hydroxy-anisaldehyde Colorless crystals of aromatic odor, m 116

isoxanthene

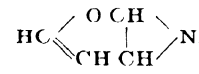


isoxazine C_4H_5ON = 83 05

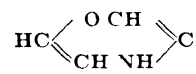
1 2- 1 2[2]-oxazine The hexacyclic compound



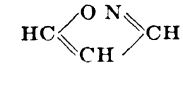
1 3- 1 3 [3]-oxazine The hexacyclic compound



1 4- 1 4 [4]-oxazine The hexacyclic compound

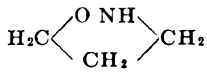


isoxazole C_3H_3ON = 69 1 Furo(a)-monazole The pentacyclic compound

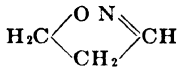


dihydro- Isoxazoline **tetrahydro-** Isoxazolidine

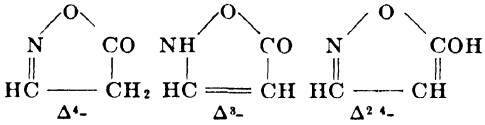
isoxazolidine C_3H_7ON = 73 1 The pentacyclic compound



isoxazoline C_3H_5ON = 71 1 The pentacyclic compound



isoxazolone $C_3H_3O_2N$ = 85 1 The pentacyclic compounds



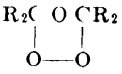
isoxazolyl The monovalent radical, C_3H_2ON—, derived from isoxazole, five isomers

isoxozonide A more stable rearrangement-product of an oxozonide, with the typical formula $R_2C(O)OC(O)OCR_2$ Cf *isozonide, oxozonide*

isoxylic acid $C_9H_{10}O$ = 150 07 *p*-Xylic acid, *2 5*-dimethyl benzoic acid, $Me_2C_6H_3COOH$ White needles, m 132 b 268 soluble in alcohol

isozingiberene $C_{15}H_{24}$ = 204 15 *1 7*-Dimethyl-*4*-propenyl octahydronaphthalene An isomer of zingiberene

isozonide A stable rearrangement-product of an ozonide, having the formula



Cf *isozozonide, ozonide*

Issoglio test A test for water-soluble or steam volatile substances characteristic of rancid fats

itaconic acid $C_5H_6O_4$ = 130 1 2, 3-dicarboxypropene, methylenebutanedioic acid*, methylenesuccinic acid $CH_2C(COOH)CH_2COOH$ m 161, decomp on further heating Cf *fumaric acid, citraconic acid*

itakolumite An elastic sandstone from Brazil, used in refractories to minimize thermal fracture

itamalic acid $C_5H_8O_5$ = 148 09 $CH_2OHCH(COOH)CH_2COOH$ A colorless deliquescent solid, m 64 (decomp), soluble in alcohol or ether Cf *citramalic acid*

-ite (1) A suffix indicating the salt of an *-ous* acid, *e g*, sulfite (sulfurous acid), chlorite (chlorous acid) (2) A common ending to indicate a mineral

itrol Silver citrate

I U See *vitamin units*

-ium A suffix denoting (1) the presence of a metal or nonmetal in a salt-forming capacity, cf *-onium,* (2) a Latin derivation Cf *-ilium, -inium,* (3) many elements, generally metals, as, sodium vanadium

iva oil A greenish oil, distilled from the flowering tops of *Achillea* species, used in flavoring extracts

ivaine $C_{14}H_{42}O_5$ = 410 2 An alkaloid obtained from *Achillea moschata* a Compositae

ivaol $C_{10}H_{20}O$ = 156 1 An alcohol found in iva oil A pale yellow oily liquid of bitter taste but pleasant odor

ivory The bone-like substance from the tusks of animals **vegetable-** Corozo

1 **black** An animal charcoal prepared by calcining the refuse from ivory working, used as a decolorizing agent and filtering medium

ivy The climbing plant *Hedera helix* an Araliaceae, the leaves and berries are used as a stimulant and diaphoretic **American-** Virginia creeper, woodvine The bark and twigs of *Vitis hederacea* a Vitaceae used as a tonic and astringent **ground-** Gill-go-over-the-ground The herb of *Glechoma hederacea* a Labiatae, used as diuretic and tonic **poison-** *Rhus toxicodendron*

iztac chalchihuitl A white or green variety of Mexican onyx, sometimes used as a gem

J

J (1) Abbreviation for joule (2) Yellow (French = jaune) Cf *colors* (3) Abbreviation for gram-equivalent weight

J-acid 6-Amino-1-naphthol-3-sulfonic acid 2, 5-Aminonaphthol-7-sulfonic acid **J-phenomenon** The absorption of x-rays by a substance varies discontinuously with a change in wavelength, λ, thus certain λ correspond with the frequency required to excite the characteristic radiation of the adsorber

jaborandi See *Pilocarpus* **j oil** A yellowish essential oil distilled from jaborandi leaves d 0 865, b 220 insoluble in water, soluble in alcohol or ether, used in pharmacy It contains pilocarpene and ketones

jaboridine $C_{10}H_{12}O_3N_2$ = 208 2 An alkaloid from jaborandi leaves

jaborine $C_{32}H_{32}O_4N_4$ = 416 6 An alkaloid from jaborandi leaves A yellow syrupy paste, insoluble in water, soluble in alcohol or ether, used as an atropine substitute in ophthalmology

jaboty fat A white tallow obtained in Brazil from the kernels of *Erisma calcaratum* and *E uncinatum* a Vochysiaceae m 42, used as a substitute for cacao butter

jacinth Hyacinth

jack Sphalerite

jacket (1) The false wall of a container by which it may be cooled or heated (2) The iron sheath of a furnace (3) The brick covering of a boiler

Jackson, Sir Herbert 1863–1936 A British chemist noted for his work on chemical research as applied to industry

jacobine $C_{18}H_{23}O N$ = 333 3 An alkaloid from *Senecio jacobaea* ragwort a Compositae It is considered to be the cause of Winton's disease of grazing animals

jaconecic acid $C_{10}H_{16}O_4$ (?) The acid product of the hydrolysis of jacobine

jade (1) True j nephrite $3MgO\ CaO\ 2SiO$ A silica mineral (q v) of the amphibole group A fusible green or flaked gem material from China and Siberia d 3 0 hardness 6 0, used as an ornament See *imperial j* (2) Jadeite greenstone, $NaAlO_2\ 2SiO_2$ A silica mineral, (q v) of the pyroxene group resembling j

jadeite Jade (2)

jaggery sugar A crude sugar from the date palm Cf *gur*

jaipurite A native cobaltous sulfite, CoS

jalap The dried root of *Exogonium* or *Ipomoea purga* a Convolvulaceae of Mexico and the West Indies It should contain not less than 7 % of resins It is a hydragogue cathartic

jalapic acid $C_{17}H_{30}O_9$ = 378 23 An acid, m 120 from jalap

jalapin $C_{34}H_{56}O_{16}$ = 700 3 Orizabin A resinous glucoside, m 150, from jalap Cf *convulvulin*

jalapinolic acid $C_{16}H_{32}O_3$ = 272 25 *d-11*-Hydroxyhexadecanoic acid*, $Me(CH_2)_5CHOH(CH_2)_{10}COOH$ A hydroxy acid from jalap resin

jalapoid The combined principles from extracted jalap A cathartic and diuretic

Jamaica dogwood The bark of *Ichthyomethia piscipula* or *Piscidia erythrina* Used as the fluid extract, as an anodyne and hypnotic **j wood** Haematoxylon

jamaicine A bitter principle from the bark of the cabbage tree, *Andira inermis*, a Leguminosae of Jamaica It resembles berberine, and is probably an alkaloid

jamboo (1) Jambu The seeds of *Piper jaborandi* a Piperaceae (2) Jambul

jambosine $C_{10}H_{15}O_3N$ = 197 2 A crystalline alkaloid from the root of *Jambosa vulgaris*, a Myrtaceae, or the rose apple of the Tropics Used medicinally in the treatment of dysentery and leucorrhea

jambul The bark of *Eugenia jambolanum* the Java plum tree a Myrtaceae, of the East Indies, used as the fluid-extract, as a stomachic astringent **j seeds** The seeds of *Eugenia jambolanum*, used as the fluid extract, as a carminative and stomachic Cf *antimellin*

jambulol $C_{16}H_{28}O_9$ = 344 1 A dibasic, pentahydroxy acid found in the seeds of *Eugenia jambolanum*, a Myrtaceae of Java It resembles ellagic acid

James powder Pulvis antimonialis Antimoniated calcium phosphate **J tea** Labrador tea

jamesonite $Pb_2Sb_2S_5$ Feather ore A native lead antimony sulfide

Jamin effect A capillary tube filled with alternate air and water bubbles sustains a finite pressure This is due to oily contamination on the glass surface, which prevents complete wetting

Janus green A green dye used as an intravital stain

japaconine $C_{26}H_{41}O_{10}N$ = 527 4 An amorphous alkaloid, m 97 derived from Japanese aconite

japaconitine $C_{34}H_{49}NO_{11}$ = 647 39 Acetylbenzoyljapaconine An alkaloid m 204 from Japanese aconite

japan A varnish for metallic and wooden articles **j camphor** Camphor **j tallow** Japan wax **j wax** A glyceride containing chiefly palmitic acid and small amounts of eicosanic and heneicosanic acids obtained from the berries of *Rhus succedanea* and other species of sumach tree A yellow solid wax d 0 970 m 53 soluble in benzene, used in the manufacture of candles, wax, and leather dressing

japanic acid $C_{22}H_{44}O_4$ = 372 34 A dibasic acid from japan wax, m 117, probably a mixture of eicosanic and heneicosanic dicarboxylic acids

japanning A process of varnishing, by successive applications of a lacquer and heating in an oven

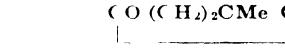
japonic acid A tannic acid from catechu

japopinic acid $C_{14}H_{22}O_2$ = 222 17 A monobasic acid from Japanese turpentine

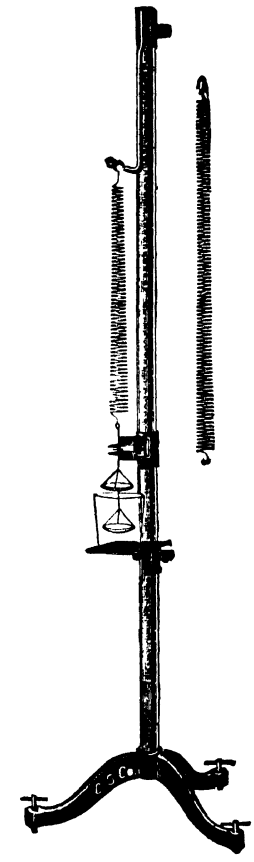
jar A small earthen vessel without spout or handle **bell-** Bell glass **Leyden j** An electric condenser consisting of a glass-vessel lined internally and externally with tinfoil **Naples-** See *Naples*

jara jara β-Naphthylmethylether

jargon, jargoon Zircon
jargonia Zirconia
jargonium An alleged element, discovered by Sorby in 1869 and probably impure hafnium
jasmine oil A colorless essential oil, distilled or extracted from the flowers of *Jasminum grandiflorum*, an Oleaceae It contains benzyl acetate, linalol, linalyl acetate and indole, d 1 008, soluble in alcohol or ether, used in perfumery
jasmone $C_{11}H_{16}O$ = 164 12 A ketone derived from jasmine oil



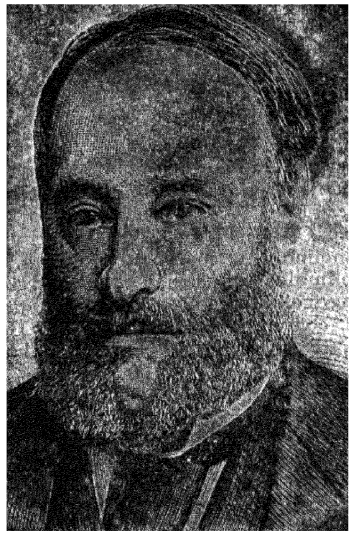
jasper Touchstone, Indian stone, bloodstone A variety of chalcedony sometimes used as a gem *e g*, iolanthite **porcelain-** Porcellanite
jateorhiza Calumba
jatrophine $C_{14}H_{20}O_6N$ = 298 17 An alkaloid from the *Jatropha gossypifolia* A light yellow powder, soluble in cold water or alcohol, insoluble in ether, acid solutions are fluorescent Used for stomach disorders
jaune The French for yellow **j brillant** Cadmium sulfide **j d'or** Martius yellow
Java pepper Cubeb **J plum** Jambul **J tea** Orthosiphonin
javelle Eau de javelle
javellization The sterilization of water supplies by hypochlorites
jaw oil An oil from the jaws of the black fish, *Globicephalus melas* used as a lubricant for fine machinery
jecolein A glyceride from codliver oil
jecorin A protein in the liver, spleen and brain, it has the composition $C_{105}H_{186}O_{46}N_5SP_3$
jel See *gel*
jelletite A green variety of andradite See *garnet*
jelly A soft, usually transparent, substance, which consists of the colloidal system (q v) liquid suspended in a solid, as, water in gelatin **mineral- or petroleum-** See *vaselin*
jellying power The capacity of substances to solidify in solution, as gelatin, agar-agar etc
jelutong The exudate from *Dyzra costulata*, an Apocynaceae, used for chewing gum and insulating cables Cf *pontianac*
jena ware Very heat-resistant glass-ware, made in Jena, Germany
jenkolic acid $C_7H_{14}O_4S_2$ = 226 2 Djenkolic acid An amino acid, $CH_2[SCH_2CH(NH_2)COOH]_2$ from djenkol beans, *Pithecalobium lobatum*, a Leguminosae
Jenner' stain A microscope stain for white blood corpuscles It consists of two solutions (A) 0 5 % eosin in methanol (B) 0 5 % methylene blue in methanol
jeppel oil Bone oil
jequiritin Abrin
Jersey tea The dried roots of *Ceanothus americanus*, a Rhamnaceae used as the fluid extract, as an astringent, sedative and expectorant
jervine $C_{26}H_{37}O_3N$ = 411 1 An alkaloid from *Veratrum* species (Liliaceae) Long, white prisms, m 240, insoluble in water
jesaconitine $C_{40}H_{51}NO_{12}$ = 735 35 An aconite alkaloid, q v
jesuits balsam Copaiba balsam **j bark** Cinchona bark
jet A dense black lignite (or cannel coal rendered black by fossilization) of varying hardness and taking a good polish Sometimes used as jewelry
jews pitch Asphalt
jig A device for ore concentration consisting of a vibrating screen submerged in water
jigger Jig
Jimson weed Stramonium
johannite Uranvitriol
johimbine $C_{23}H_{32}O_4N_2$ = 400 4 An alkaloid from the bark of *Corynanthe yohimbehe*, a tree of Africa Cf *quebrachine, yohimbine*
jojoba The shrub *Simmondsia Californica*, a Buxaceae of California and Mexico **j oil** The oil from the nuts of j containing unsaturated fatty acids, resembling the sperm oil of the whale
Joliot, Frédéric 1900– , and his wife **J, Irène Curie**, 1897– , daughter of Pierre and Marie Curie French physical chemists and Nobel prize winners (1935) for their work in induced radioactivity
Jolly balance A spring balance for determining the specific gravity of a solid by weighing it alternately in air and water



Jolly balance

Jones' reagent A bath of molten zinc in which a metal to be etched is immersed **J reductor** A glass tube filled with amalgamated granulated zinc or zinc wire spirals, used for reducing solutions of Fe, Ti, Mo, V, Cr and U, prior to their volumetric determination by oxidation reduction methods
jordanite A native arsenic and lead sulfide As_8S_3 4PbS
joseite A bismuth tellurite, Bi_2Te
josephinite A native iron and nickel alloy from Oregon
Joule, James Prescott 1818–1889 An English physicist and experimenter on energy transformations Cf *joule* **J effect** Heat effect **J equivalent** The mechanical equivalent of heat, or the quantity of energy which, when transformed into heat is equal to unit quantity of heat 4 185 × 10^7 ergs = 1 Calorie (20°) In absolute units (q v) $J = L^2T^{-2}\theta^{-1}$, or $JH = JM\theta = ML^2T^{-2}$ **J -Kelvin effect** The fall in temperature of a gas forced at high pressure through a small orifice It is proportional to the difference in pressure on the two sides, and is used in the Linde-Hampson process of liquefying gases **J -Thomson effect** J -Kelvin effect **J 's law** (1) The heat, H, produced by a current (I) is proportional to the square of the current, multiplied by the time (t) during which it flows $H = RI^2t$ (2) The internal energy of a volume of gas does not vary with temperature, if the volume remains constant (3) The molecular heat of a solid compound is the sum

of the atomic heats of its constituents. J. unit. Joule.



James Prescott Joule.

joule. The unit of work. One joule equals 10^7 units of work (ergs) in the C.G.S. system, and is practically equivalent to the energy expended in one second by one ampere passing through one ohm of resistance. Hence:

Joule = amp.^{2} × ohm × sec. = watt × sec. = (volt^2 × sec.)/ohms = 10^7 ergs.

Conversion factors:

1 joule = 1 volt-coulomb = 0.24 calorie = 0.1020 kg.-m. = 0.7376 ft.-pds.

1 calorie = 4.1850 joules = 0.04337 volt-electrons.

3600 joules = 1 kelvin = 1 watt-hour.

juar. Sorghum.

Juerst ebullioscope. A device for determining small percentages of alcohol by observing the boiling point of the liquid, which varies directly with the percentage of alcohol.

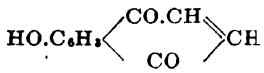
juglandin. A resinoid from the root-bark of juglans. A grayish-brown powder, slightly soluble in alcohol; used as a cathartic.

juglandoid. The combined principles from the root-bark of juglans, or butternut.

juglans. Butternut bark, white walnut. The dried inner bark from the roots of *Juglans cinerea*, a Juglandaceae; used as the fluid extract, as a cathartic and antiperiodic. Cf. *nucite*.

juglansin. A globulin from walnuts and butter nuts.

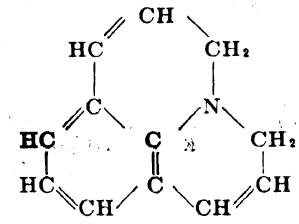
juglone. $C_{10}H_6O_3$ = 174.1. 5-hydroxy-naphthoquinone, nucin.



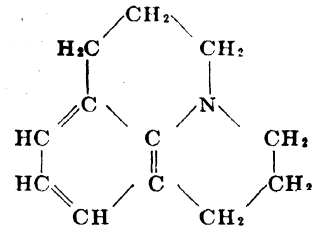
Reddish-brown prisms, m.153, insoluble in water. It occurs in the bark of the European walnut, *Juglans regia*

juice. (1) Any fluid from a vegetable or animal tissue; usually however, fruit juice. (2) A colloquial term for an electric current.

julol. $C_{12}H_{11}N$ = 169.1. The theoretical compound:



julolidine. $C_{12}H_{15}N$ = 173.2. 1,2,5,6-tetrahydrojulol.



jumble beads. Abrus.

Jungius, Ioachim. 1587–1657. A [illegible]-chemist, and forerunner of Boyle in claiming that observation and experiments alone give information as to the nature of matter.

juniper. The juniper tree, *Juniperus communis*, a Coniferae of temperate zones. **gum-** Sandarac. **j. berries.** The dried ripe fruits of juniper, used as a diuretic and tea, or as the fluid extract. **j. berry oil.** An essential oil distilled from juniper berries. Colorless or yellow liquid, d.0.865, b.120, soluble in alcohol or ether. Used as stimulant diuretic, or in flavoring extracts. It contains pinene, cadinene and j. camphor. **j. tar.** Cade oil.

juniperic acid. $C_{16}H_{32}O_3$ = 272.25. Dihydroambrettolic acid, *o*-hydroxypalmitic acid, *16*-hydroxyhexadecanoic acid*. A monobasic acid, m.95, from savin, *Juniperus sabina*, and arbor vitae.

juniperin. A bitter principle from juniper, *Juniperus communis*.

juniperus. (1) The dried tops, with wood and berries, of juniper; used for distillation of an essential oil, and in fumigation. (2) A genus of Coniferae yielding berries, oils and wood: *J. communis*, juniper; *J. sabina*, savin.

junket. Curds and whey, a food prepared by coagulating milk with rennet.

jurubeba. *Solanum insidiosum*.

jute. The bast fiber of *Corchorus* species, a Tiliaceae of the East Indies and South America; used extensively in the manufacture of gunny sacks, bags, and twine. **China-** The fiber of *Abutilon avicenna*, a Malvaceae cultivated in China. **medical-** the fibers of *Corchorus olitorius*, used in surgical dressings.

juvenile water. A water of magmatic or deep-seated origin, supposed to come for the first time to the earth surface; *e.g.*, the waters of certain hot springs, volcanic geysers and artesian wells.

K

(See also under C)

(1) The symbol for potassium (kalium), K^+, K potassium ion, K^* excited potassium atom, K_2^+ ionized potassium molecule, K_2^* excited potassium molecule (2) An abbreviation for Kelvin, °K degree on the absolute temperature scale **K acid** 1-Amino-8-naphthol-4 6-disulfonic acid **K electrons** The two electrons in the innermost shell or orbit of the atom **K line** (1) Any one of a group of lines having the shortest wavelength which are visible when K radiations pass through an x-ray spectrograph The separated lines are termed, respectively, $K\alpha_1$, $K\alpha_2$, $K\beta_1$, $K\beta_4$ etc (2) The Fraunhofer line, λ3933 7, due to calcium (3) Symbol for chemical equilibrium constant (see *law of mass action*) (4) Symbol for Kelvin K_S Symbol for solubility product **K orbit** The innermost path of electrons around the atomic nucleus Cf *atom, Bohr's theory, orbit* **K radiation** The homogeneous x-rays emitted by metals when used as an anticathode in an x-ray tube, their origin is assumed to be due to the excitation of the K electrons Cf *energy levels* **K series** The spectral lines produced by K radiations Cf *Moseley spectrum* **K spectrum** The spectrum produced by K radiations The frequency of any line is approximately proportional to $A(N - b)^2$, where N is the atomic number, A and b are constants The atomic number $N = Q_K + 1 = Q_L + 7\ 4$, where Q_K and Q_L are quantities expressing the frequencies of the K and L series of radiations, respectively

(1) Abbreviation for a constant Symbol for (2) Boltzmann's constant, (3) thermal conductivity, (4) velocity constant of chemical reactions

The Greek letter *kappa* See *Greek* alphabet

A An aluminum alloy similar to duraluminum

ıbaite A native hydrocarbon found in meteorites

e- See *kae-, ke-*

ıempferide $C_{16}H_{12}O_6$ = 300 1 Kaempferyl-4-methyl ether A constituent of galangal, m 225 soluble in sulfuric acid (blue fluorescence) and in alkali (yellow color)

ıempferol $C_{15}H_{10}O_6$ = 286 08 A cyclic alcohol, m 274, from *Indigofera erecta*

ıfir Sorghum **k corn** Durra

ıfirin A protein derived from sorghum

ahle's solution See *fixative*

ıhweol $C_{19}H_{26}O_3$ = 302 2 A highly-unsaturated alcohol, m 143, from coffee bean oil

ınite $MgSO_4\ K_2SO_4\ MgCl_2\ 6H_2O$ A native potassium magnesium sulfate from Strassfurt (Germany) and made synthetically, used as a potash fertilizer, and in water treatment The A O A C defines it as potassium and sodium chloride sometimes with magnesium sulfate, containing not less than 12 % K_2O

ırine $C_{10}H_{13}ON$ = 163 2 Methyloxytetrahydroquinoline A quinine substitute, usually marketed as the hydrochloride **k hydrochloride** $C_{10}H_{13}ON\ HCl$ = 199 6 A grayish-white crystalline powder, soluble in water, used as an antipyretic and quinine substitute Cf *thalline*

kairoline $C_{10}H_{13}N$ = 147 2 Methyltetrahydroquinoline A colorless liquid, b $_{720mm}$245, soluble in alcohol, used as an antipyretic

Kaiserling solution A solution for preserving tissues, consisting of 3 gm CH_3COOK, 1 gm KNO_3, 75 cc water and 30 cc formaldehyde

kakodyl Cacodyl

kakoxene The mineral $2Fe_2O_3,P_2O_5,12H_2O$

kaladana The dried seeds of *Ipomoea hederacea*, used as a purgative and anthelminthic **k resin** A resin obtained from kaladana, used as purgative

kalaite A form of turquoise which contains copper and iron Cf *callaite*

kali The German term for potassium hydroxide **k ammonsalpeter** A mixture of KCl and NH_4NO_3 used as fertilizer (16 % N, 27 % K_2O)

kalicrete A modification of Portland cement, containing iron, which is resistant to alkali soils

kalimeter Alkalimeter

kalinite A native potassium aluminum sulfate, $K_2Al_2(SO_4)_4\ 24H_2O$

kaliophylite $KAlSiO_4$ A silica mineral (q v) of the nephelite group

kalium The Latin and German for potassium

kalk The German for lime **k ammon** A mixture of NH_4Cl and $CaCO_3$ used as fertilizer **k ammon salpeter** Calnitro

kallaite Kalaite

Kalle acid *1*-Naphthylamine-*3 7*-disulfonic acid

kallekrein Padutin A circulatory hormone, which regulates the capillaries and small vessels

kalmia Mountain laurel, sheep laurel, lambkill The leaves of *K latifolia*, a Ericaceae, used as cardiac sedative and astringent They contain asebotin and andromedotoxin

kalsilite $2KAlSiO_4$ A polymorph mineral resembling nepheline, occurring as minute grains in volcanic rocks of high K_2O-content from Uganda

kamacite A component of meteoric iron-nickel alloys, which is present only when the nickel-content is less than 6 5 %

kamala Glandulae Rottlerae A light, fine granular powder which consists of the glands and hairs from the capsules of *Mallotus philippinensis*, an Euphorbiaceae, used as the fluid extract, as a purgative

kamalin $C_{22}H_{20}O_6$ = 380 1 Rottlerin The bitter principle of kamala A yellowish-brown powder, m 200, soluble in alcohol or ether, used as an anthelminthic

kamarezite A native basic copper sulfate, occurring in grass-green compact masses

kambi An aromatic gum, resembling elemi, from *Gardenia lucida*, a Rubiaceae of India

Kamerlingh-Onnes, Heika 1853–1926 A Dutch physicist and Nobel prizewinner, noted for experiments at very low temperatures

mpometer An instrument for measuring heat radiations Cf *kapnometer*

nerol $C_{30}H_{50}O$ = 426 5 An alcohol from the roots of *Kanher nerium*, a plant of India Colorless crystals, m 185, insoluble in water

nirin Trimethylamine oxide

nyl alcohol. $C_{10}H_{18}O_2$ = 170 14 An alcohol from the liver oil of tarabakani, *Paralithodes camtschatica*, of the Japan Sea

oliang oil Koryan oil

olin $Al_2O_3\ 2H_2O\ 2SiO_2$ China clay, porcelain clay, bolus alba, terra alba, white bole, argilla A native aluminum silicate, $H_2Al_2Si_2O_8$ A grayish-yellow, fine, inert powder which is used in ceramics, as filler for paper and textiles, and for pencils It occurs in three distinct types produced as shown

1 kaolinite (by weathering)
2 dickite (by moderate heating)
3 nakrite (by hypogene processes)

Cf *atalpo*, *fuller's earth*, *kaolinite*, *montmorillonite*

olinite The chief constituent of kaolin or clay, $Al_2O_3\ 2SiO_2\ 2H_2O$, if heated above 1100°C it breaks down to mullite and cristobalite A soft white, fine powder, used medicinally as an absorbent and dusting powder, as a clarifying agent and in pharmacy

olinization Natural rock-disintegration and formation of clay from the feldspars of decomposed granite (orthoclase)

pnometer An instrument for measuring the density of smokes Cf *kampometer*

pok The Malay name for the cotton-like down from the seed-pods of *Eriodendron anfractuosum*, a Sterculiaceae, used in making mattresses and life-saving jackets **k oil** A yellowish-green oil, expressed from k seeds, d 0 923, soluble in alcohol or ether, used in the m anufacture of soap and edible fats

ppa κ The tenth letter of the Greek alphabet A symbol for (1) kata position (2) The tenth carbon atom

rabin $C_{21}H_{49}O_6$ = 397 5 A resinous substance from *Nerium oleander*, an Apocynaceae

rat See *carat*

raya gum An Indian gum similar to tragacanth, used in tooth-pastes

ritene $C_{32}H_{56}$ = 440 4 A solid hydrocarbon, m 64, from shea fat

rpholite The mineral $(Mn,Fe)O\ (Fe,Al)_2O_3\ SiO_2\ 2H_2O$

ryokinesis The phenomena of cell-division or mitosis, during which the protoplasm of the cell and its nucleus undergo a series of changes which are subdivided into a number of phases merging from one into the other (see figure)

ta- cata A prefix derived from the Greek, indicating down or below **k position** κ- (1) The *1 7*-substitution in naphthalene, q v (2) On the tenth carbon atom of a chain **k thermometer** An instrument which measures the cooling effect of air flow as distinct from the temperature of the air used to evaluate working conditions in terms of ventilation

tabolism Catabolism

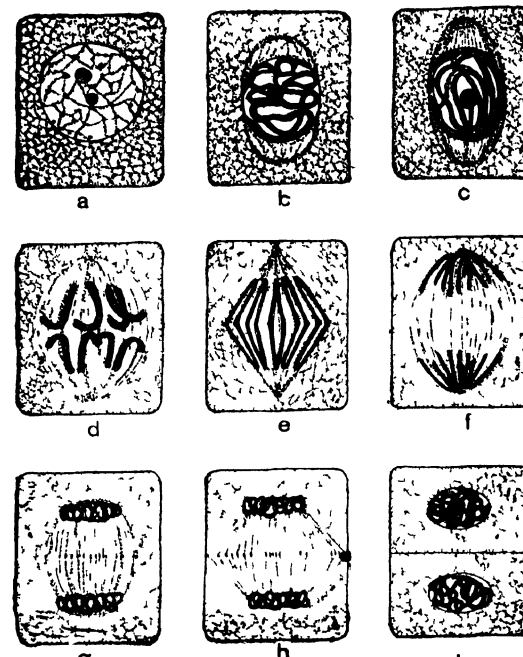
talase See *catalase*

talysis Catalysis

taphoresis Cataphoresis

tchung Chinese for peanuts [Kachang = Malay] **oil of-** Peanut oil

tharometer An instrument for the analysis of a gas mixture by the changes in its therma conductivity



KARYOKINESIS

(*Semidiagrammatic and highly-magnified After Stevens'* 'Plant Anatomy")

a Resting cell ready to divide
b Nuclear reticulum forming a thickened thread, the cytoplasm at opposite poles becoming thread-like, to form the spindle fibers
c Nuclear thread divided longitudinally, spindle fibers more definite
d Nuclear membrane and nucleolus disappear the nuclear thread is segmented into chromosomes assembled at the equator of the cell Phases a to d are *prophases*
e The *metaphase* The longitudinal halves of the chromosomes are being drawn apart prior to their journey to the opposite poles
f The *anaphase*, or movement of the chromosomes toward the poles, is complete, connecting fibers extend from pole to pole
g The *telophase* The chromosomes begin to spin out as a nuclear reticulum The connecting fibers thicken in the equatorial plane
h The connecting fibers spread out and touch the wall of the mother cell in the equatorial plane, the thickening of the fibers throughout this plane has made a complete cell plate, within which the dividing wall will be produced
i A nuclear membrane is formed about each daughter nucleus, the dividing cell-wall is completed The two daughter cells are now ready to grow to the size of the parent cell, the daughter nuclei will appear as the nucleus in a

kathode Cathode

katine $C_{10}H_{18}ON_2$ = 182 2 An alkaloid from the leaves of *Catha edulis* or African tea, a Celastraceae Cf *celastrine*, *cathine*

kation Cation

katode. Cathode.

kauri. Kauri gum, kauri resin. A resin exuded from the kauri tree, *Agathis australis*, a conifer of New Zealand, and dug from the soil in large masses. A yellow amber-like resin, d.1.05, m.180–230, insoluble in water, soluble in alcohol, turpentine or benzene; used in varnishes. **k. gum.** Kauri. **k. oil.** An oil obtained by distilling the peat which remains from prehistoric kauri forests.

kaurinic acid. $C_{10}H_{16}O_2$ = 168.2. An acid constituent (about 1.5 %) of kauri.

kaurinolic acid. $C_{17}H_{34}O_2$ = 270.3. An acid constituent (about 15 %) of kauri.

kaurolic acid. $C_{12}H_{20}O_2$ = 196.2. The principal constituent (50 %) of kauri.

kauronolic acid. $C_{12}H_{34}O_2$ = 200.2. A constituent of kauri (10 %).

kautchin. Terpene.

kava. Kava kava. Ava. The dried rhizome of *Piper methysticum*, a Piperaceae of the Polynesian islands, used as the fluid extract as a mild diuretic and stimulant. **k. resin.** A resin derived from kava, containing kavaic acid.

kavaic acid. $C_{13}H_{12}O_3$ = 216.1. An acid derived from kava. A yellow crystalline powder, m.165.

kavain. $C_{16}H_{18}O_5$ = 290.2. Methysticin. A principle derived from kava. White crystalline needles, m.137, soluble in alcohol or ether.

kavatel oil. An oil obtained from the seeds of *Hydnocarpus Wightiana*, used in place of chaulmoogra oil.

kawa. Kava.

Keen tester. An instrument for determining the hardness of metals by the impact ball method.

kefir. Kephir, kephyr. A fermentation product of goat's milk produced by the *Bacillus caucasicus;* used as a nutritious and restorative food. Cf. *koumiss*. **k. milk.** A beverage made from cow's milk and kefir powder. **k. powder.** White irregular bodies containing a yeast fungus and several bacteria; used to make kefir and kefir milk.

keilhauite. A native titanate and silicate of aluminum, calcium, iron and the rare earths metals, similar to sphene, q.v.

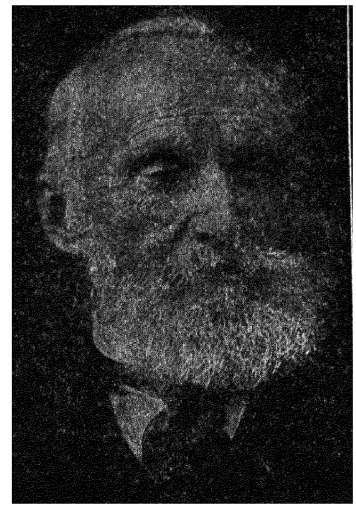
Kekulé, Friedrich August. 1829–1896. A German chemist and a pioneer in the theories of the constitution of carbon compounds. **K. ring.** See *benzene ring*.

kelene. A trade name of ethyl chloride.

kellin. A glucoside from the fruit of *Ammi visnaga*.

kelp. (1) Varec. The large seaweeds, *Laminaria* species, floating near the shores of the Pacific and Atlantic. (2) Kelp ashes. **dried-** A fertilizer containing 1.6–3.3 % N, 1–2 % P_2O_5 and 15–20 % K_2O. Cf. *algin*. **k. ashes.** Kelp. The ashes of kelp, formerly used for the preparation of potassium salts and iodine.

Kelvin, William Thompson (Lord Kelvin). 1824–1907. A British physicist and pioneer in electrical and magnetic experimentation; noted for his work on thermodynamics, the compression of gases, the absolute temperature scale and the Atlantic cable. **k. bridge.** A set of coils by which highly accurate resistance measurements may be made. **k. galvanometer.** An elliptical coil surrounding a magnetic needle suspended on a fine wire with mirror attached, by which small electric currents are detectable. **k. scale.** °K. An absolute temperature scale (q.v.) assumed to be a measure of kinetic energy. The freezing point of water is 273.13°K, the boiling point of water 373.13°K, hence (°K) = (°C) + 273.13, (if above 0°C); and (°K) = 273.13 − (°C), (if below 0°C).



William Thompson Kelvin.

kemfert. Trona potash. A potassium cl from the waters of Searles Lake in California.

Kendall, Edward, Calvin. 1886– . An American chemist, noted principally for the isolation of thyroxin from the thyroid gland. **K., James.** 1889– . A British chemist, noted for his work in inorganic and physical chemistry.

Kennelly-Heaviside layer. A stratum of electrons, 100-200 miles above the earth's surface, created by solar rays. It is supposed to form a layer impenetrable by radio waves, and is the seat of the aurora, q.v. Cf. *ionosphere*.

kepayang oil. An oil resembling chaulmoogra oil, from the seeds of Pokok kepayang.

kephalin. (1) Cephalin, brain lipoid. A lecithin phosphatid from spinal and brain tissue of the ox or other mammals. It is an amorphous yellow substance of characteristic odor, slightly soluble in alcohol or acetone, soluble in ether or chloroform. Cf. *cuorin*. (2) A group of phosphatides from white brain substance resembling lecithin (q.v.) in structure, but with aminoethyl alcohol in place of the choline residue. They are white, brittle, very hygroscopic solids, forming colloidal solutions in water, soluble in fat solvents (except acetone); hydrolysed slowly to stearic acid and a mixture of unsaturated fatty acids by acids and alkalis.

kephaloidin. A constituent of the buttery substance of brain, q.v.

kephyr. Kefir.

ker. A Polish synthetic rubber, made from alcohol.

kerasol. $C_{20}H_{10}O_4I_4$ = 821.8. Tetraiodophenolphthalein. The soluble sodium salt is used to render the gall bladder visible in x-rays. It is administered in small gelatin capsules (nosophen, antinosin).

kerasin. $C_{48}H_{93}O_8N$ = 881.7. A cerebroside associated with phrenosin in the brain tissue. A white amorphous powder, m.180 (decomp.), soluble in hot alcohol, insoluble in water or ether.

keratin $C_{41}H_{71}O_{14}N_{12}S$ A protein from horns, feathers, hoofs, shells or finger nails, sometimes used for coating pills It is resistant to digestion by pepsin and trypsin and insoluble in water, dilute acids or alkalis On acid hydrolysis it yields arginine, lysine and histidine in the ratio 12 4 1 It is believed to exist in a straight chain and folded chain form, the latter is converted into the former by simultaneous steaming and stretching

keratoelastin A protein from the egg shells of fishes, reptiles and monotremes

kerenes That portion of kerotenes which is insoluble in organic solvents

kerites The naturally-occurring bitumens and protobitumens, which consist of kerotenes

kermes The dried insects, *Coccus ilicis*, found on the leaves of various oak species in the Orient, used since ancient times as a red dye for textiles **k mineral** Kermesite

kermesite Sb_2S_2O Lyrostibnite A native, red antimony sulfide Used as pigment

kern The German for "ring" and "nucleus" especially the benzene ring

kernel An atom stripped of its valence electrons, it consists of the atomic nucleus surrounded by its proper number of electrons in their respective orbits or shells (cf *periodic system*, *isostere*) with the exception of the outermost series of valence electrons Atomic kernels fall into eight groups, according to the number of electrons missing The k are always positively charged and those having a charge of from one to four correspond with the respective ions, Na^+, Mg^{++}, Al^{+++}, and Sn^{++++} The k differs from the nucleus, q v (See figure)

kernite $Na_2B_4O_7\ 4H_2O$ A natural borate, from Kern County, California

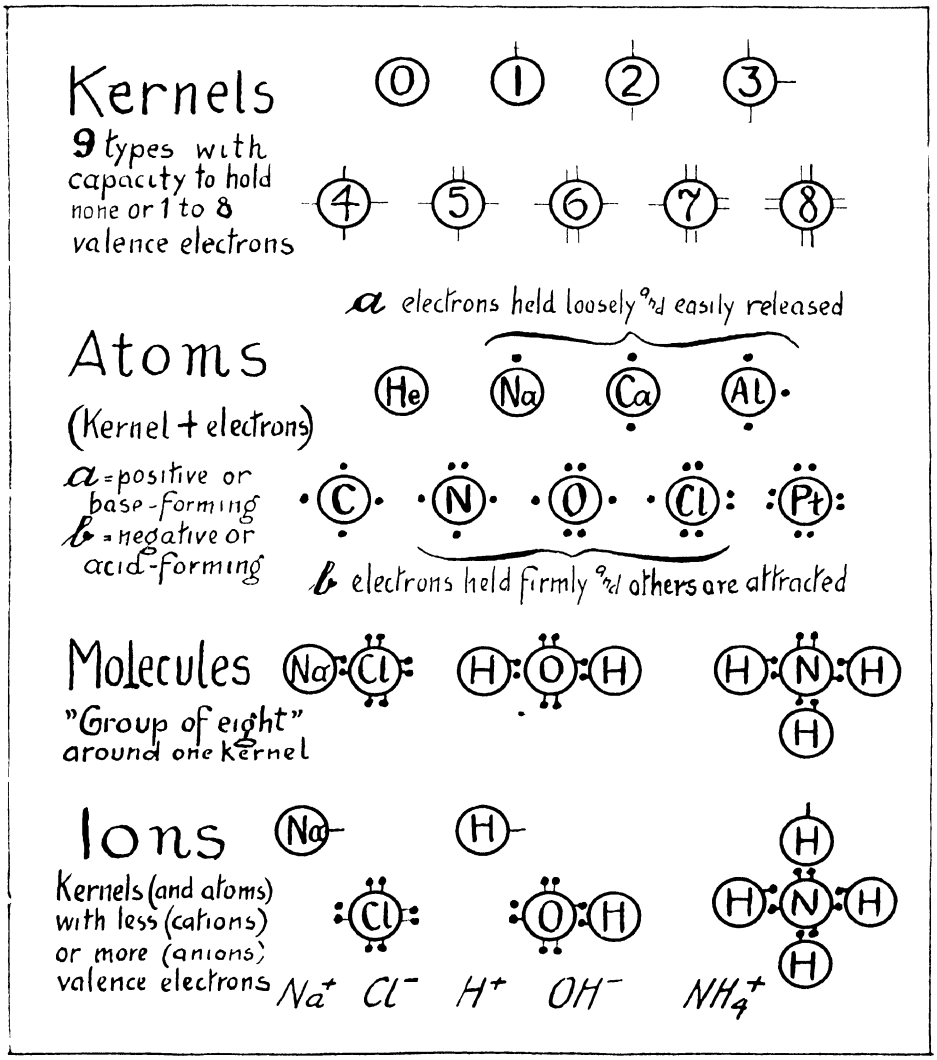
kerogen $(C_6H_8O)_n$ A resinous substance and the chief organic constituent of shale oils insoluble in most solvents Cf *oil shale*

kerokaine Procaine

keroles That portion of kerotenes which is soluble in pyridine but insoluble in chloroform

kerols That portion of kerotenes which is soluble in both, chloroform and pyridine

kerones Those portions of kerotenes which are insoluble in organic solvents



kerosene Coal oil, astral oil, paraffin (British usage) A mixture of hydrocarbons b 150–280°C , the fifth fraction in the distillation of petroleum (after the gasoline and before the oils) Used as a fuel illuminant and cleaning agent

kerotenes That portion of bitumen which is insoluble in carbon disulfide Cf *carboids, kerenes, kerites, keroles, kerols, asphaltenes*

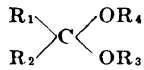
Kerr constant If L is the difference in wavelength between the ordinary and extraordinary rays, λ the wavelength of the light, v the potential and d the distance between the poles, $L = k\lambda v^2/d^2$, where k is the Kerr constant which is characteristic for a liquid **K effect** Electrical birefringence, or the polarizing effect of an electro-magnet The elliptical double refraction of light by liquids in an electric field

kesso oil Japanese valerian oil An essential oil distilled from the roots of *Valeriana officinalis* A thick, green, liquid, d 0 996, insoluble in water, soluble in alcohol, ether, chloroform or benzene used in pharmacy

kessyl alcohol $C_{14}H_{24}O_2$ = 224 19 Wrongly called kersyl alcohol An alcohol, m 85 b $_{11mm}$156, from kesso oil

Kestner, Paul 1864– A Swiss chemist, noted for work on refractories and filtering materials

ketal (1) An obsolete term for the >CO group, as, dimethyl ketal (= acetone) (2) Ketone acetates prepared by condensation of alkyl orthoformates with ketones in presence of alcohols General formula,



ketazin $C_6H_{10}N_2$ = 112 2 A colorless liquid, d 0 836 b 131, soluble in water

ketazine Bisazimethylene A compound containing the radical >C N—N C< as

$Me_2CN\ NCMe_2$ dimethyl-ketazine or bisdimethylazimethylene

$Et_2CN\ NCMe$ diethyl-ketazine or bisdiethylazimethylene

$MeEtCN\ NCEtMe$ methylethyl-ketazine or bismethylethylazimethylene

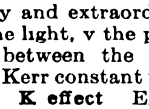
ketene C_2H_2O = 42 0 Keto-ethylene ethenone, carbomethene, $CH_2\ CO$ The simplest possible ketone A colorless gas of penetrating odor, b −56, decomposed by water, soluble in alcohol or ether It may be considered as an anhydride of acetic acid, used for acetylation in the manufacture of cellulose acetate **k diacetal** $C_6H_{12}O_2$ = 116 0 Ethoxyethylene, $CH_2\ C(OEt)_2$ A colorless liquid, b 125 which reacts with water to form ethylacetate It polymerizes to a white solid on standing

ketenes A group of very reactive organic compounds of the general type $R_2C\ CO$, as, $(CH_3)_2C\ CO$, dimethylketene* Two types, **aldo- K** having the general formula CO, colorless, polymerized by pyridine, and incapable of autoxidation Cf *aldo-ketens* **keto- K** having the general formula CO, colored, readily auto-oxidized and forming additive compounds Both aldo- and keto-ketenes are homologs of ketene Cf *ketoketenes, ketines*

ketimide An organic compound of the general type $R_2\ C\ NX$, where X is an acyl radical Cf *ketimine, amide*

ketimine An organic compound containing the bivalent >C NH group Cf *ketone, imine*

ketine $C_6H_8N_2$ = 108 2 *2 5*-Dimethyl-pyrazine, A colorless liquid, d 0 990, m 15, b 153, slightly soluble in water

ketines A group of organic compounds of the general type R  C R, derived from ketine Cf *ketenes, pyrazine*

ketipic acid $C_6H_8O_6$ = 174 1 Oxalodiacetic acid, hexane-3 4-diondiacid The dibasic acid $HOOC\ CH_2\ CO\ CO\ CH_2\ COOH$

keto- Oxo- A prefix indicating the presence of the keto or carbonyl group, >C O, in an organic compound Cf *ketone* **k acid** See *ketone acid* **k enol** See *tautomerism, desmotropism, ketonic ester type*

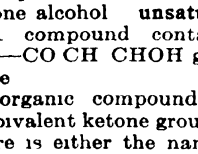
ketoamine An organic compound containing both, the keto and amino group, as, $R\ CNH_2 \cdot CO\ R$, formed by the action of ammonia on ketones Cf *polypeptide*

ketocoumaran $C_8H_6O_2$ = 134 1 Ketodihydrocoumarone, Colorless crystals, m 97

ketohexose A monosaccharide with six carbon atoms, with a keto-group instead of the usual aldehyde group, *e g* , fructose and sorbose

ketohydroxyestrin $C_{18}H_{22}O_2$ = 270 1 A hormone isolated from the urine of pregnant women and mares It is an anhydride of trihydroxyestrin Cf *sterols, cholane derivatives*

ketoimine A compound containing an imino and keto group as *e g* , in ketoimidotetrahydrothiazole



ketoindole Oxindole

ketoketenes The dialkylated homologs of keten $R_2C\ CO$ They are colored, readily autoxidized and form additive compounds with tertiary amines Cf *aldoketens*

ketol Ketone alcohols A compound containing a keto and hydroxy group **alpha-** A compound containing the R—CO CH_2OH group **beta-** A compound containing the R—CO $CH_2 \cdot CH_2OH$ group **saturated-** Either an alpha- or beta-ketone alcohol **unsaturated-** Acivinyl alcohols A compound containing the unsaturated R—CO CH CHOH group

ketole Indole

ketone An organic compound R CO R, containing the bivalent ketone group, >C O The nomenclature is either the naming of the two radicals before the term *ketone* (as dimethylketone), or attaching the suffix *-one* to the hydrocarbon $CH_3\ CO\ CH_3$ is dimethylketone or propanone* (acetone), $C_2H_5\ CO\ C_2H_5$, diethylketone, or 3-pentanone*, $CH_3\ CO\ CH_2\ CH_2 \cdot CH_3$, methylpropylketone or 2-pentanone * **acid-** Ketone acid **aldehyde-** A compound containing the =CO and —CHO groups **amino-** Ketoamine **amylethyl-** *3*-Octanone*

KETONES

a aliphatic, saturated

cetone, propanone*	Me CO Me
utanone*	Me CO Et
-pentanone*	Et CO Et
-pentanone*	Me $CO(CH_2)_2Me$
-hexanone*	Et $CO(CH_2)_2Me$
-hexanone*	Me $CO(CH_2)_3Me$
inacolin	Me_3C CO Me
almitone	$Me(CH_2)_{14}CO(CH_2)_{14}Me$

b aliphatic, unsaturated

³-2-butenone	MeCOCH CH_2
³-2-pentanone	MeCOCH CH_2Me
horone	Me_2C CH CO CH CMe_2

c aliphatic, diketones

iacetyl, *2 3*-butane-dione*	MeCOCOMe
4-pentanedione	MeCOCH COMe
3-pentanedione	MeCOCOEt

d cyclic

yclobutanone*	CO CH_2 CH_2 CH_2
yclopentanone*	CO CH_2 CH_2 CH_2 CH_2

e aromatic

etophenone	Ph CO Me
ropiophenone	Ph CO Et
utyrophenone	Ph $CO(CH_2)_2Me$
phenyl-2-propanone	Ph CH_2 CO Me
enzophenone	Ph CO Ph
3-diphenyl-2-pro-panone	$(PhCH_2)_2$ CO
enzil	Ph CO CO Ph

f quinones

inone	CO CH_2 CH_2 CO CH_2 - CH_2 See also *indone, naphthoquinone, anthraquinone phenanthrenequinone*, etc

amylmethyl- *2*-Heptanone* **butylmethyl-** *2*-Hexanone* **di-** A compound containing two ketone groups, *e g*, di-alpha-ketones of the type R CO CO R, di-beta-ketones of the type R CO CH_2 CO R, di-gamma-ketones of the type R CO CH_2 CH_2 CO R **dibutyl-** *5*-Nonanone* **diethyl-** *3*-Pentanone* **diheptyl-** *8*-Pentadecanone* **dimethyl-** Acetone **dipropyl-** *4*-Heptanone* **ethylmethyl-** *2*-butanone* **ethylpropyl-** *3*-Hexanone* **methylpropyl-** *2*-Pentanone* **mixed-** A compound in which two different radicals are attached to the ketone group, *e g*, Me CO Et (methyl ethyl ketone) **nitroso-** A compound containing the ketone and nitroso groups **olefine-** A ketone of the olefine series **paraffin-** A ketone of the paraffin series **simple-** A compound in which two similar radicals are attached to the ketone group, *e g*, Me CO Me (dimethylketone) **tri-** A compound containing three ketone groups, of the type R CO CO CO R

k acid A compound containing both the >CO and —COOH radicals *alpha-* A compound containing the monovalent —CO COOH radical, *e g*,

CH_3 CO COOH—Propanone-acid or pyruvic acid

CH_3 CH_2 CO COOH—propyonyl-carboxylic acid

HOOC C_6H_4CO COOH—phthalonic acid

beta- A compound containing the monovalent —CO CH_2 COOH radical, *e g*,

CH_3 CO CH_2 COOH—Butanone-acid, aceto-acetic acid

gamma- A compound containing the monovalent —CO CH_2 CH_2 COOH radical, *e g*

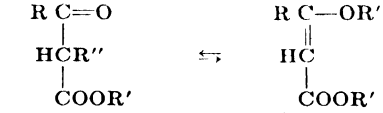
CH_3 CO CH_2 CH_2 COOH—laevulinic acid

delta- A compound containing the monovalent —CO CH_2 CH_2 CH_2 COOH, radical, *e g*,

CH_3 CO CH_2 CH_2 CH_2 COOH—acetobutyric acid

k alcohol See *ketol* **k base** Tetramethyldiaminobenzophenone **k color** An artificial coloring material containing the ketone group, *e g*, alizarin chrysophanic acid **k form** See *ketonic ester type* **k group** The bivalent >C O group Its presence usually confers reducing powers

ketonic Pertaining to a ketone **k ester type** An isomer of an enolic ester type compound



ketonic ester type enolic ester type

The radical R'' has changed place, and the double bond of the ketone group has swung to a carbon-carbon double bond Cf *acetoacetic ester, desmotropism*

ketose A sugar containing a ketone group, as opposed to an aldose (containing the aldehyde group) Cf *ketohexose, fructose*

ketoside A glucoside which yields a ketose when hydrolyzed

ketosis The excretion of acetone bodies

ketotriazole Triazolone

ketoxime (1) Acetoxime A compound containing the bivalent =C NOH group *E g*, Me_2C N OH, acetoxime or dimethyl ketoxime, Et > C N OH, methylethyl ketoxime (2) Me

Compounds containing the divalent —HC - NO— group Cf *Beckmann rearrangement* (3) See *dioximes* **tetra-** See *diphenyl t k*

kettle A cylindrical vessel for boiling or evaporating a liquid or digesting it with a solid

key A mechanical device for establishing electrical contact, or reversing or switching on an electrical current **three-way-, two-way-** K for switching a current three or two ways, respectively

k atom (1) An atom in a chain whose alteration of electronic structure (or number of shared or free valences) induces corresponding changes in the other atoms of the chain (2) An atom in a ring whose oscillations cause a shift of bonds, as, the metallic atom in the porphin ring, q v

kg. An abbreviation for kilogram

kharsivan British-made salvarsan

khat Cafta, Arabian tea The dried leaves of *Catha edulis*, used as a tea

Khotinsky, Achilles de 1850–1933 A Russian-born American designer of instruments, diffraction-gratings, etc **de K cement** A laboratory c for glass and porcelain, insulating, covering and connecting electric wires, glass, rubber, wood, etc It is not attacked by ordinary solvents

kibbled Broken up into small lumps of about 1 cm diameter

kidney A mammalian organ which eliminates urea, chlorides, and creatinine from the blood It also filters, through the capsule, the non-colloidal material from the blood plasma

kidney ore Red *hematite*

kies A general term for sulfide ores

kieselguhr Diatomite Tripoli powder A diatomaceous or infusorial earth (q v) Used as an absorbent for nitroglycerin (dynamite), also for filtering, insulating, and as an abrasive in soaps

kieserite $MgSO_4 H_2O$ A native magnesium sulfate occurring in white compact masses in the Stassfurt salt beds

Kikuchi lines The black and white lines which appear when a stream of electrons is directed on a crystal surface, they are due to the scattering of electrons by the row of atoms Cf electron *microscope*

killeen Irish moss

Kiliani, Heinrich A German chemist **K reaction** The synthesis of a higher homolog by forming a nitrile, followed by hydrolysis *e g*, pentose to hexose

$$\text{R CHO} \xrightarrow{HCN} \text{R CHOH CN} \xrightarrow{2H_2O} \text{R CHOH COOH} \xrightarrow{NaHg} \text{R CHOH CHO}$$

kiln (1) A potter's oven for baking bricks (2) A furnace for calcining or drying coarsely-broken ore or stone

kilo- (1) A prefix derived from the Greek, indicating one thousand units (2) Kilogram

kilocalorie C al A great (or large) calorie 1 C al = 1000 calories

kilocycle A frequency of 1000 vibrational cycles per second Radio ranges principally from 550 1500 k c (545–200 meters), and the ultra short wave 60 000 k c (5 meters)

kilodyne 1000 dynes (0 9806 gram)

kilogram A unit of weight in the metric system, equal to 1000 grams It was intended to be the mass of 1 cubic decimeter of water at 4°C 1 kg = 1000 grams = 15,432 25 grains = 2 2046 pounds av = 35 27 oz av = 32 1507 ounces troy = 2 679 pounds apoth Cf *liter cubic centimeter* **International prototype-** I P Kg A cylinder of platinum-iridium alloy, which is the standard k weight

kilogrammeter A unit of energy in the metric system The energy required to raise one kilogram one meter 1 kg m = 7 233 ft-pd

kilojoule A unit of heat A large joule, J, 1000 joules = 239 1 gram-calories

kiloliter Stere, kl = 1000 liter = 35 371 cubic feet = 2641 7 U S liquid gallons

kilometer A unit of length in the metric system 1 km = 1000 m = 3280 83 feet = 1093 61 yards = 0 62137 mile (1 mile = 1 609 km)

kilonem A unit of nutrition equivalent to 667 calories, supplied by a liter of milk

kilostere A unit of volume, equivalent to one thousand cubic meters = 1000 kiloliters (steres)

kilowatt A unit of electrical power 1 KW = 1000 watts = 1000 joules per second = 1 341 horse power = 238 7 calories per second (1 horsepower = 746 KW) **k hour-** A commercial unit of electrical energy 1 K W H = 1000 watt-hours = 3,600,000 joules per second = 1 B Th U

kilurane A unit of radio-activity 1 ku = 1000 uranium units (uranes)

kinase Zymoexcitor A substance existing in various tissues of a living organism, which activates or transforms a zymogen into an active enzyme **entero-** See *enterokinase*

kinematics The science of motion and types of motion, apart from the forces which produce it.

kinetic (1) Pertaining to motion (2) The branch of dynamics which deals with the action of forces in causing or influencing the motion of bodies **k chemicals** Gases used as refrigerants **k energy** The force possessed by a body due to its motion, it is proportional to one-half of its mass, m, multiplied by the square of its velocity v KE = $mv^2/2$ or (in ergs) = $\text{gm} \times \frac{(\text{cm/sec})^2}{2}$ **k theory** The hypothesis that all molecules are in motion this motion is most rapid in gases less rapid in liquids and very slow in solids, and is a function of the temperature It is related to the gas-laws by the equation $PV = \frac{1}{3} nmv = RT$, where n is the number of molecules Evidence of this motion of the molecules is found in evaporation, diffusion Brownian motion, expansion, the gas laws

kineurine Quinine glycerophosphate

kings yellow Orpiment

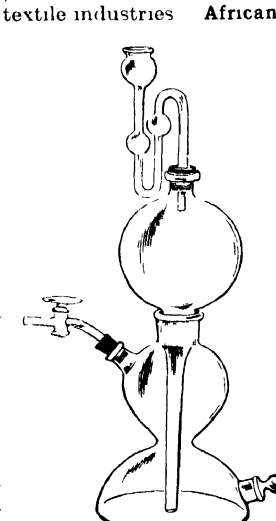
kinic acid Quinic acid

kino Kino gum The dried juice of *Pterocarpus marsupium*, a leguminous tree of tropical Africa Reddish-brown, brittle, odorless fragments, slightly soluble in water, soluble in alcohol Used as the tincture, as an intestinal astringent, also in tanning and textile industries **African-** Kino **American-** The dried juice of *Coccoloba uvifera* used as a k substitute **Marri-** A red gum from *Eucalyptus calophylla*, a Myrtaceae

kinoin $C_{14}H_{12}O_6$ = 276 1 A resin from kino

kinovin Quinovin

Kipp generator A glass apparatus consisting of three compartments used in the laboratory for generating gases, generally hydrogen sulfide, from solid and liquid reagents



Kipp generator

Kirchhoff, Gustav Robert 1824–1887 A German physical chemist noted for the development of the spectroscope spectrum analysis electrical subjects **K equation** $\log p = A + B/t + C \log t$, where p is the vapor-pressure of a gas at the absolute temperature t, and A, B, and C are constants

kish Crystalline graphite deposited in iron furnaces from molten iron

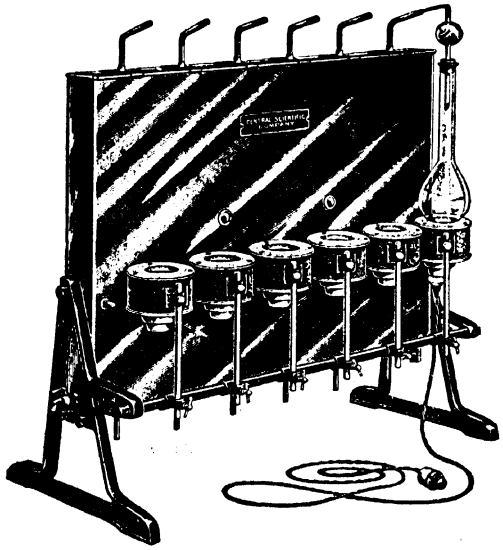
kisidwe oil A hard white, solid fat obtained from the nuts of *Allanblackia* species, from the Gold Coast of Africa used in soap manufacture

kittool fiber Kittul A fiber obtained from the leaves of a Ceylon palm, *Caryota urens*, used in the manufacture of brushes

kittul Kittool

Kjeldahl, J 1849–1900 A Danish chemist noted for analytical methods **K apparatus** An arrangement for distilling ammonia from an

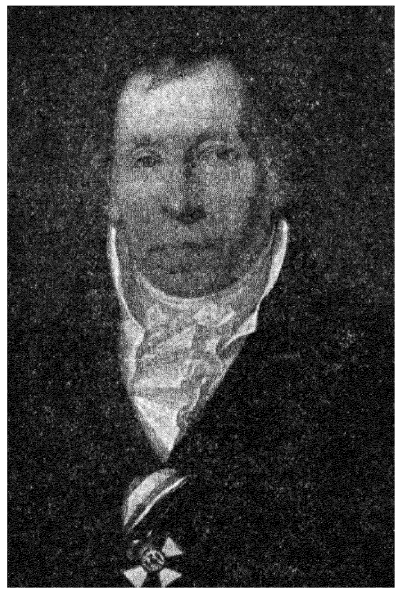
organic compound. **K. flask.** A pear-shaped flask of heat- and acid-resistant glass with a long neck. **K. method.** A method of determining the nitrogen in an organic compound by digesting the substance with concentrated sulfuric acid and distilling the ammonia from the ammonium sulfate formed into a measured quantity of standard sulfuric acid (see figure).



Kjeldahl apparatus showing one K. flask and six heaters.

l. An abbreviation for kiloliter = 1000 liters.

Klaproth, Martin Heinrich. 1743–1817. A German chemist, who discovered uranium, titanium, and zirconium.



Martin Heinrich Klaproth.

aprotholite. A copper bismuth sulfide, $Cu_6Bi_4S_9$.

Kleinenberg mixture. A mixture of cacao butter, spermaceti, and castor oil, used in microscopy as an imbedding material.

kleinite. A native mercury oxide and chloride, $HgCl_2.3HgO$.

Klein's liquid. A saturated solution of cadmium borotungstate, d.3.28, used in mineralogy for the separation of minerals.

klydonograph. A device to record automatically a temporary excess voltage, which causes a spark to pass through a moving film. The resulting Lichtenberg figures indicate the nature of the current.

km. An abbreviation for kilometer = 1000 meters.

knap. To break up, *e.g.*, lumps of ore.

knead. To work or press a number of ingredients into one mass, usually with the hands.

knock. The nearly instantaneous and very high-pressure explosion of a compressed mixture of fuel and air in an internal combustion engine. In this explosion a large proportion of the energy is given out as radiant energy and absorbed by the walls of the cylinder, thus reducing the available mechanical energy. It is usually identified with pinking and pre-ignition, but these are considered by some to be distinct phenomena. **anti-** A substance added to a liquid fuel, as gasoline, which slightly retards the explosion and thereby reduces the wasted energy. *Antiknock gasoline* contains 0.05 % of tetraethyl lead. See *ethyl* gasoline, *motalin.*

knock-compound. Antiknock. A substance which when added to gasoline, reduces the knock and thereby increases the efficiency of the combustion engine.

Knop, Johann Ludwig Wilhelm. 1817–1871. A German agricultural chemist and founder of the "Chemisches Centralblatt." **K.'s solution.** A nutrient for plants: 1 pt. KNO_3, 1 pt. KH_2PO_4, 1 pt. $MgSO_4$, 4 pts. $Ca(NO_3)_2$ and a trace of ferric phosphate in 1000 pts. H_2O.

knoppern. Galls. A tannin material produced on various oaks by insects.

Knorr, Ludwig. 1859– . A German chemist noted as discoverer of antipyrine. **K. alkalimeter.** A device for determining carbon dioxide, used extensively in agricultural laboratories.

knot. The speed of 1 nautical mile (6082.66 ft. per hour).

knotgrass. English- The herb of *Polygonum aviculare*, a Polygonaceae; used as an astringent. **Russian-** The herb of *P. erectum;* used as an astringent.

knoxvillite. A native chromous sulfate, $CrSO_4$.

kobold. An early name for cobalt.

Koch, Robert. 1843–1910. A German bacteriologist and discoverer of the tubercle bacillus.

Robert Koch.

K.'s acid. Naphthylamine-*3.6.8*-trisulfonic acid. **K. bacillus.** The tuberculosis bacillus. **K. flask.** A pear-shaped flask used for growing bacterial cultures. **K. grinder.** A grinding apparatus for powdering bacteria.

koechlinite. A native bismuth molybdenum oxide, $Bi_2O_3\ MoO_3$.

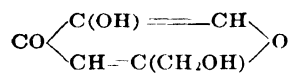
kogi An enzyme used in the production of miso, q v

Kohlrausch, Friedrich 1840–1910 A German physicist **K. law** The conductivity of an electrolyte is the sum of the conductivities of its component ions, provided complete ionization has taken place **K bridge** An instrument for measuring the conductivity of an electrolyte, it is analogous to the Wheatsone bridge, q v

koilin An indigestible scleroprotein lining of birds' gizzards, soluble in boiling water

koilonychia A form of dermatitis affecting the fingers of workers with alkaline cements

kojic acid $C_6H_6O_4$ = 142 05 *3*-hydroxy-*5*-hydroxymethyl-γ-pyrone A hydroxy acid formed from glucose in 153, by certain molds, *e g*, *Aspergillus oryzae*



Cf *ascorbic acid*

kola Cola, kola nuts The dried seeds of several *Cola* species, a Sterculiaceae of Africa, it contains 2–3 % caffeine Used medicinally, as a nervine and cardiac stimulant, commercially, in the manufacture of beverages

kolanin $C_{40}H_{56}O_{21}N_4$ = 928 7 A glucoside from kola, which hydrolyses to caffeine, glucose and kolared

kolared $C_{14}H_{13}(OH)_5$ = 266 2 A red coloring matter from kola nuts

Kolbe, Adolph Wilhelm Hermann 1818–1884 A German organic chemist and prolific writer, who made the second organic synthesis (chloroacetic acid) Cf *Wöhler*

kolm A radioactive asphaltic mineral containing 0 45 to 0 027 % Pb

komanic acid Pyrone-α-carboxylic acid

konel An alloy of 8 % ferrotitanium, 17 % cobalt and 73 % nickel, used as platinum substitute for radio-tube filaments

koniogravimeter An instrument for the determination of the amount of dust in air

kontrastin Zirconium oxide used as a lining substance for stomach, intestines, etc in x-ray examinations

Kopp, Hermann 1817–1892 A German physical-chemist **K's law** Every element has the same specific heat in its solid free state and in its solid compounds Thus, the molecular heat is the sum of the atomic heats of the component atoms

Koppeschaar solution A 0 1 N bromine solution Cf *potassium bromate*

koppite A vitreous brown mineral, $(Ca\ Ce,Fe,Hg,Na_2)O,NbO_2,H_2O$

koprosterol Coprosterol

koroseal. Trade name for a vinylchloride plastic

koryan oil Kaoliang oil An oil from *Andropogon sorghum*, koryan corn, from Manchukuo, d 0 926, $n_D^{20.1}$ 4655, sapon no 187, iodine no 121

kosam seeds. The fruits of *Brucea sumatrana*, a Simarubaceae of China, used for dysentery and diarrhea

kosin Koussin

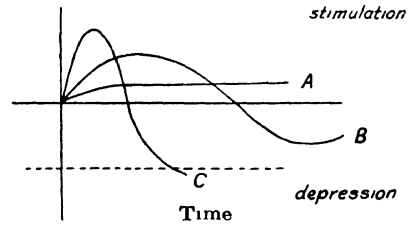
koso Kousso

kosotoxin $C_{26}H_{34}O_{10}$ = 506 3 A yellow, amorphous principle from kousso

Kossel press A metal syringe, used for making sodium wire

kotoin Cotoin

Kotschau hypothesis The effect of small (A), moderate (B) and large (C) doses of drugs is expressed by the following curves where "*degree of stimulation*" is plotted against *duration* of effect



Cf *Arndt Schulz rule*

Kottstorfer number Saponification number

koumiss A drink prepared from mare's milk by fermentation with kefir yeast

kounidine $C_{21}H_{24}N_2O_5$ = 384 18 An alkaloid from the stem and leaves of Chinese *Gelsemium* species, which produces muscular and respiratory weakness

Kourbatoff's reagent An etching agent in the microanalysis of steel A 4 % HNO_3 in isoamyl alcohol B Equal parts of 20 % HCl in isoamyl alcohol and a saturated solution of nitroaniline in alcohol C Equal parts of 4 % HNO_3 in acetic acid, methanol, ethanol and isoamyl-alcohol D 3 pts of saturated nitro-phenol in alcohol and 1 pt 4 % HNO_3 in alcohol

koussein A yellowish, amorphous principle from kousso, used as an anthelmintic

koussin $C_{31}H_{38}O_{10}$ = 570 4 Kosin Kussin A resinous substance from kousso, used as an anthelmintic

kousso Cusso, brayera The dried flowers of *Brayera anthelmintica* (*Hagenia Abyssinica*), a Rosaceae, used as a fluid extract, as an anthelmintic Cf *brayerin*

kovar A group of alloys of Fe, Ni, and Co which show a sharp change in the coefficient of expansion at certain temperatures, used for all-metal radio tubes and thermostats

Kr The symbol for krypton

K-radiation See *K*-radiation

kraft paper A strong (German kraft = force) wrapping paper made from wood pulp prepared by the sulfate process

krameria Rhatany root, payta The dried root of *K triandra* (Peru) or *K argentia* (Brazil) a genus of polygalaceous shrubs of South America Used as the fluid extract, as a powerful astringent and tonic

krantzite A variety of retinite

Kraut's reagent A microchemical reagent for ephedrine made by mixing *A* and *B* and diluting to 100 cc *A* is 8 gm bismuth nitrate in 20 cc conc HNO_3 *B* is 27 2 gm potassium iodide in 50 cc H_2O

kreatine, kreatinine See *creatine, creatinine*

Krebs cycle See *citric* acid cycle

Kreis test A test for three-carbon chain unsaturated aldehydes, characteristic of rancid fats A red color develops in the aqueous layer after an ethereal solution of fat has been treated with HCl and phloroglucinol solution

kremersite A native potassium, ammonium and iron chloride, $KCl\ NH_4Cl\ FeCl_3\ 1\frac{1}{2}H_2O$

krennerite (1) A native telluride of gold and silver, $(Ag, Au)Te_2$ (2) Bunsenite

kreosol Cresol

kreotoxin A meat-poison or ptomaine formed by bacteria

kresatin $C_9H_{10}O_3$ = 166 2 m-cresylacetate, $MeCOOCH_2C_6H_4OH$ A colorless oily liquid, used medicinally as an antiseptic for diseases of the eye, ear, nose and throat

krinosin $C_{38}H_{79}O_6N$(?) A lipin isolated from the brain substance

krith Crith The weight of one liter of hydrogen, at 0°C and 760 mm 1 krith = 0 0896 gram A term used in the statement of density of a gas with reference to hydrogen, thus the density of hydrogen is one krith, the density of chlorine 35 5 kriths

krocodylite Crocidolite

krügite A native potassium and magnesium sulfate, $MgSO_4\ K_2SO_4\ 4CaSO_4\ 2H_2O$

Krupp's disease The special type of fragility shown by steels after tempering and reheating

kryofine $C_{11}H_{15}O_3N$ = 209 12 Cryofine, methoxyacet-p-phenetidine, methylglycocoll-phenetidine EtO C_6H_4 NHCO CH_2OMe Colorless needles m 98, soluble in water, alcohol, ether, or chloroform Used as an antipyretic

kryogenin (1) See *cryogenin* (2) $C_8H_{10}O_2N_4$ = 194 1 m-benzaminosemicarbazide, NH_2CO - C_6H_4 NH NH $CONH_2$ An odorless, colorless, slightly bitter powder soluble in water, used as an antipyretic and antiseptic

kryoscopy (1) The methods of determining the molecular weight of a substance by observing the lowering of the freezing point of its solutions See *cryoscopy* (2) In general, the production of low temperatures (3) That branch of metallurgy which deals with the phenomena occurring during the cooling of molten alloys

kryptidine $C_{11}H_{11}N$ = 157 1 *2 4*-dimethyl quinoline A homolog of quinoline

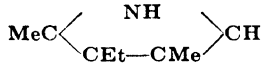
krypto- See *crypto-*

kryptocyanin $C_{29}H_{25}N_2I$ = 480 0 *1 1'*-diethyl-*4 4'*-carbocyanin iodide A photographic sensitizer for the infra-red, used to photograph through haze

kryptol A granular mixture of graphite, carborundum and clay, used as a resistance in electric furnaces

krypton Kr = 82 7 A colorless, inert, noble gas and element atomic number 36, which occurs in the atmosphere (1 per 1,000,000), $d_{(air=1)}$ 3 708, m −169, b −152 9 It forms no known chemical compound, and appears to consist of six isotopes of atomic weights 84, 86, 82, 83, 80, and 78

kryptopyrrole $C_8H_{13}N$ = 123 1 *α β'*-dimethyl-*β*-ethyl-pyrrole, 2 4-dimethyl-3-ethyl-pyrrole



A split-product of chromoproteins

kryptoxanthin $C_{40}H_{55}OH$ = 552 4 Caricaxanthin A yellow, carotinoid pigment from the pods of *Physalis* species, *Carica papaya* and yellow corn Cf *carotene*

KSK Ethyl iodoacetate

kuh-seng A Chinese drug consisting of the dried roots of *Sophora flavescens*, a Leguminosae Its chief alkaloid is matrine

kukersite An Esthonian shale oil containing 43 % of organic matter (kerogen)

kukoline An alkaloid obtained from *Cucullus diversifolius*, an Asclepiadaceae

kumyss Lac fermentatum A sweetened cow's milk, fermented with yeast and used as a nutrient Cf *koumiss*

Kundt 1839–1894 A German physicist **K's constant** (1) See *K's rule* (2) A value obtained by dividing Verdet's constant by the magnetic susceptibility of the substance Values Fe = 2 63, Ni = 3 15, Co = 3 99 **K effect** The rotation of the plane of polarised light in certain vapours and gases under the influence of magnetic forces **K's rule** In the absorption of light by a solution, an increase in refractive index of the latter produces a shift in the absorption bands towards the red to an extent defined by K's constant **K's tube** A horizontal tube containing a light powder, in which the gas or air is made to vibrate, by sounding a note at the open end The sand sets itself in heaps whose distance apart is a measure of the velocity of sound in the gas and hence of its specific heat

Kunkel, Johann 1638–1703 A German alchemist who published, under the pseudonym "Baron von Lowenstjern," a chemical textbook "Laboratorium Chymicum" He also developed glass manufacture and prepared phosphorus

kunzite A native lithium aluminum silicate, $LiAl(SiO_3)_2$, a pink variety of spodumen

kupfernickel Niccolite

kupferron Cupferron

kupramite A preparation used in gas-masks as an absorbent for ammonia

kurchi The bark from the root of *Holarrhena antidysenterica*, an Apocynaceae, used as a fluid extract, as a febrifuge and antidysenteric

kurchine An alkaloid obtained from kurchi, q v

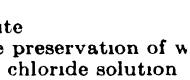
kurrajong oil A thick, red oil from the seeds of *Brachychiton populenum*

kusamba. A liquid opium solution obtained by macerating opium with rose-water

kussin Koussin

kuteera gum Hog gum

kyanidine $C_3H_3N_3$ = 81 2 *1 3 5*-triazine The heterocyclic compound



Cf *cyanidine*

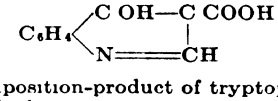
kyanite Cyanite

kyanizing The preservation of wood by steeping it in mercuric chloride solution

kyanol An early name for aniline

kymograph An instrument for recording variations of blood pressure

kynurenic acid $C_{10}H_7O_3N$ = 189 09 4- or γ-hydroxy quinoline carboxylic acid, 4-hydroxyquinaldic acid The cyclic compound



A decomposition-product of tryptophane occurring in dog's urine, as prisms m 289 soluble in hot water

kynurenine $C_{11}H_{12}N_2O_4$ = 236 08 A dibasic amino-acid from urine, $NH_2\ C_6H_4\ C(COOH)$ - $CH\ CH(NH_2)COOH$

kynuric acid $C_9H_7O_5N$ = 209 1 Oxalylanthranilic acid, carbostyrilic acid Colorless crystals, m 288

kynurin C_9H_7ON = 145 06 4- or gamma-hydroxyquinoline, *4*-quinolinol Colorless crystals, m 201, b 300, soluble in water or alcohol

kyrine A basic substance resulting from the hydrolysis of proteins

kytoplasm Cytoplasm

L

l. An abbreviation for: (1) liter; (2) latent heat per gram; (3) length, (4) ionic mobility; (5) mean free molecular path.

l- Abbreviation for levo- or levorotary; *l(d)*- levo- (or dextro-); *ld-* levo- and dextro- (= meso).

L. An abbreviation for: (1) the abstract unit of length; L^2. abstract unit of area; L^3. abstract unit of volume; (2) latent heat per mol.; (3) solubility product. **L acid.** Same as *1*-Naphthol-*5*-sulfonic acid. **L electron.** The electrons located in the second shell or orbit of the atom; their maximum number is eight, and they are built up in the period from Li = 1, Be = 2, to O = 6, F = 7, and completed by Ne = 8. **L lines.** (1) The group of lines following the K lines, q.v. (2) The Fraunhofer lines λ 3820 to λ 3858, due to iron. **L orbit.** The second series of paths of electrons around the atomic nucleus, and outside the innermost K orbit. **L radiations.** The second series of homogeneous x-rays characteristic of the metal used as anticathode, and analogous to the K radiations, q.v. **L shell.** The second layer of electrons in the static atom (Lewis-Langmuir), which correspond with the L-orbit of the dynamic atom (Bohr-Sommerfeld). **L. spectrum.** The spectrum due to L radiations. Cf. *K spectrum, Moseley spectra.*

λ The Greek letter "lambda," q.v.

Λ The Greek capital letter "lambda," q.v. The symbol for equivalent conductivity.

La. The symbol for lanthanum.

lab. Lab ferment, rennase. The ferment of rennet, which causes the coagulation of milk.

Labarraque Antoine Germaine. 1777–1850. A French apothecary. **L. solution.** A solution of sodium hypochlorite, used as a disinfectant and deodorant; contains not less than 2.4 % available chlorine.

labdanum. A resin from *Cistus* species; used as stimulant and expectorant.

label. A square, colored paper tag, prescribed for shipping chemicals in the U. S. by the Railroad Commissioners.

white—for corroding liquids, acids, etc.

yellow—for oxidizing materials and inflammable solids.

red—for inflammable liquids and inflammable compressed gases.

green—for non-inflammable compressed gases. Cf. *hazard, compressed gases, storage.*

LaBel tube. A distilling tube with two or more bulbs and return tubes, used for fractional distillation.

Labiate. Mint family, a group of aromatic herbs that yield several important essential oils:

herbs:

Mentha piperita	peppermint
Mentha spicata	spearmint
Hedeoma pulegioides	pennyroyal
Marrubium vulgare	horehound
Melissa officinalis	balm
Scutellaria lateriflora	skullcap
Cunila mariana	dittany
Glechoma hederacea	ground ivy
Lycopus virginicus	bugle
Lavandula spica	lavender oil
Origanum majorana	sweet majoram
Origanum vulgare	wild marjoram
Thymus serpyllum	wild thyme
Leonurus cardiaca	motherwort
Monarda punctata	horsemint
Monarda fistulosa	wild bergamot
Hyssopus officinalis	hyssop
Teucrium chamaedrys	germander
Teucrium scordium	water germander
Teucrium marum	teucrium
Lamium album	lamine
Nepeta cataria	catnip

leaves:

Salvia officinalis	sage
Rosmarinus officinalis	rosemary
Thymus vulgaris	thyme
Orthosiphon stamineus	Java tea
Pycnanthemum montanum	mountain mint
Satureia hortensis	summer savory
Micromeria douglasii	yerba buena
Ocimum basilicum	sweet basil
Stachys betonica	betonica

flowers:

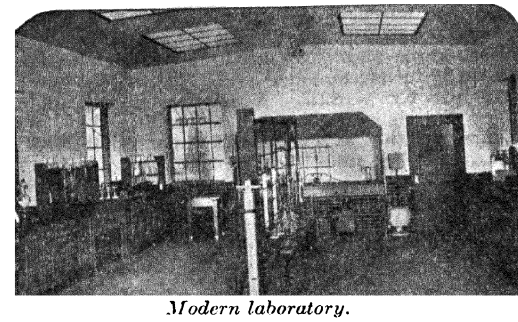
Lavandula vera	lavender

rhizomes:

Collinsonia canadensis	stone root.

labile. Unstable. **l. acid.** See *acid.* **l. state.** Temporary stability.

laboratory. The chemical working place.



Modern laboratory.

Labrador tea. James tea, marsh tea, wild rosemary. The leaves of *Ledum palustre*, an Ericaceae, used as tea in Labrador, and as an expectorant. It contains ledum camphor, ericinol and ericulin.

labradorite. Saussurite. An irridescent lime-soda feldspar.

laburnine. An alkaloid from *Cytisus laburnum*, a Leguminosae. Cf. *cytisine.*

lac. (1) Lacca, resina lacca, lacca gum, lakh. A resin exuding around twigs of *Croton* species, a Euphorbiaceae, and *Fiscus* species, a Moraceae of the East Indies, caused by the bite of the female insect, *Coccus lacca.* (2) The bodies of *Coccus lacca*, used as a red dye. (3) Milk;

as *lac sulfuris* = milk of sulfur **α-lac** A suggested name for the insoluble portion of shellac **stick-** The crude l as taken from the tree, still impure with twigs, a deep reddish-brown resin **seed-** L broken from the twigs, minute irregular fragments **shel-** Shellac Prepared from the above by melting and straining Cf *shellac*

lacca See *lac, shellac* l **coerula** Litmus

laccaic acid $C_{16}H_{12}O_8$ = 332 1 Laccaimic acid A red crystalline constituent of lac, decomp 180

laccase (1) An oxidizing enzyme of the sap of plants (lac tree, etc) (2) A class of oxidases which act on phenols

lacceroic acid $C_{31}H_{63}COOH$ = 480 29 Dotriakontanic acid A fatty acid, m 95, in some waxes Cf *psyllic acid*

lacerate To cut or tear a margin into irregular segments

lachry- See *lacri-*

lacmoid $C_{12}H_9O_4N$ = 231 1 Resorcinol blue Lustrous dark violet scales, slightly soluble in water soluble in alcohol or acetone, used as an indicator in titrating mineral acids bases, and alkaloids blue (pH 6 4) in alkaline, red (pH 4 4) in acid solution l **tincture** A solution of 0 5 % gm lacmoid in 100 cc water and 100 cc alcohol Used as indicator

lacmus Litmus

lacquer (1) A varnish natural or containing shellac (2) The solution of a resinous body which applied to an object (by dipping, spraying or brushing) dries by evaporation of the solvent and leaves a protective covering (3) A solution of a cellulose ester in a solvent, *e g* ,

cellulose nitrate	15 parts
plasticizer	5 10 parts
resin	5 parts
solvent	70–75 parts

acetate- A relatively unnflammable solution of cellulose acetate in carbon tetrachloride **bronzing-** A solution of nitrocellulose in amyl acetate with suspended aluminum or bronze powder **brush-** A l applied with brushes **Burmese-** A natural l exuding from the stems of *Melanorrhea usitata*, an Anacardiaceae, which turns black on exposure **cellulose-** Lacquer (3) **Chinese-** Japanese- **collodion-** See *collodion* **dip-** A l used for the dipping or immersion of objects **glyptal-** A solution of the synthetic resins made from glycerol and organic acids **Japanese-** The resinous sap of *Rhus vernicifera*, an Anacardiaceae of Japan and China It is often colored by pigments and thinned with camphor oil or turpentine **nitrocellulose-** The commonest form of l , containing cellulose nitrate in an organic solvent

l **solvent** A group of organic liquids which dissolve resins gums or nitrocellulose and are used in the manufacture of lacquers, varnishes, and rayon They are classified according to (1) boiling point (see solvents), or (2) type

One-type solvents, such as

1 Alcohols *e g* , ethanol
2 Ethers *e g* , ethyl ether
3 Ketones *e g* acetone
4 Esters *e g* , ethyl acetate

Two-type solvents which may be either a mixture of two or more of the above compounds, or a single compound that contains two or more of the characteristic groups, such as

1 Alcohol-esters, *e g* , ethyl glycollate
2 Alcohol-ethers, *e g* , diethylglycerol
3 Alcohol-ketones, *e g* , diacetone alcohol
4 Ketone-esters, *e g* , ethyl pyruvate
5 Ketone-ethers, *e g* ethoxy acetone
6 Ester-ethers, *e g* , ethoxy ethyl lactate

lacri- A prefix indicating tears

lacrimation An excessive secretion of tears

lacrimator A tear-producing substance, as, ethyl iodoacetate

lacrimatory An agent which produces excessive secretion of tears Cf *dacryagogue* l **gas** A poison gas used in warfare which produces tears, as benzyl bromide, dichlorophenylcarbylamine

lacry- Lacri-

lactalbumin The albumin of milk, of high biological value Cf *proteins*

lactam Lactin An organic ring-compound containing in its ring the —NH—CO— group The ring is formed by the elimination of water from the —COOH and —NH_2 group Cf *lactims lactoxime* The more common are

gamma- or γ- A pentatomic ring, as γ-butyrolactam or α-pyrrolidone, $CH_2<^{CH_2—CH_2}_{NH}>CO$

delta- or δ- A hexatomic ring, as δ-valerolactam, or α-piperidone, $CH_2<^{CH_2—CH_2}_{CH_2—NH}>CO$

lactamic acid Alanine

lactamide $C_3H_7O_2N$ = 89 1 α-hydroxypropionamide lactic acid amide *2*-hydroxypropanamide*, Me CHOH $CONH_2$ Colorless crystals, d 1 138, m 74, slightly soluble in water or alcohol

lactamine Alanine

lactan Lactam

lactase An enzyme occurring in the intestinal juice, which hydrolyzes lactose to dextrose and galactose

lactasidase A zymase which converts lactose to lactic acid

lactate (1) A salt of lactic acid a compound containing the monovalent Me CHOH COO— radical (2) To produce milk

lactation The secretion of milk

lactazam A ring compound containing the —NH NH CO—group in its ring, as butyrolactazam or 3-methylpyrazolon

$NH<^{CMe\ CH}_{NH}>CO$

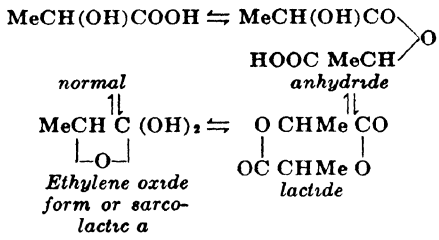
Cf *pyrazolone, phenyllactazam*

lactazone Lactoxime

lactic acid $C_3H_6O_3$ = 90 1 α-hydroxypropionic acid, *2*-hydroxypropanoic acid*, ethylidenelactic acid, acid of milk, fermentation lactic acid A fermentation acid from milk or carbohydrates A colorless and odorless liquid, d 1 240, m 18, b_{12mm} 119, soluble in water, alcohol, or ether Used as a reagent in detecting glucose and pyrogallol, also in organic synthesis, in leather, textile, and tanning industries, and in pharmacy Also used as to substitute citric and tartaric acids There are two tautomeric varieties of which the above is the *dl-* form, produced by fermentation of carbohydrates

l- or levo- $H—C(COOH)(HO)—CH_3$ and *d-* or dextro- $H—C(OH)(HOOC)—CH_3$

d- l produced in muscle tissues by splitting glucose, or by the action of *Micrococcus acidi paralactici* A solid, m 25 **l- L** formed by the action of *Bacillus acidi levolactica* **p-** Para- See *d-* **sarco-** *d-* The aqueous solution of l consists of an equilibrium of four forms

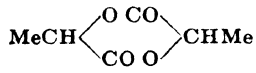


l acid series A group of monobasic hydroxy acids of the general type HO R COOH, and the general formula $C_nH_{2n}O_3$ or $C_nH_{2n}(OH)COOH$

carbonic (hydroxyformic) acid	HO COOH
glycollic acid, hydroxyacetic acid	HO CH_2 COOH
lactic acid, hydroxypropionic acid	HO C_2H_4 COOH
hydroxybutyric acid	HO C_3H_6 COOH
hydroxyvaleric acid	HO C_4H_8 COOH
hydroxycaproic (leucinic) acid	HO C_5H_{10} COOH

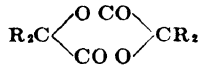
lactic anhydride $C_6H_{10}O_5$ = 162 1 Lactic acid anhydride, *2*-hydroxypropanoic anhydride*, $(MeCHOHCO)_2O$ An amorphous white powder, m 250, slightly soluble in water, soluble in alcohol or ether

lactide $C_6H_8O_4$ = 144 1 *3 6*-Dimethyl-*2 5-p*-dioxandione A condensation-product of lactic anhydride

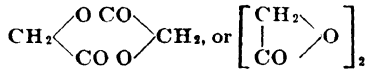


Monoclinic crystals, d 0 862, m 128, b 255, slightly soluble in water or alcohol Cf *lactides*

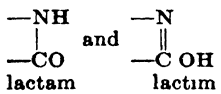
lactides Compounds formed by the condensation of two α-hydroxyacids or their anhydrides They are of the general type



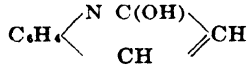
The simplest is glycollide,



lactim Lactin An organic ring compound containing the bivalent —N COH— group in its ring They are isomeric with lactams, and differ in that they are formed by the elimination (as water) of the two H of the NH_2 group and the O of the CO group



Thus, carbostyryl,



is the lactam of o-aminocinnammic acid The H of the OH group is replaceable Cf *peptide*

lactin (1) Lactose (2) Lactim

lactobacillus A bacillus which causes lactic acid fermentation of milk

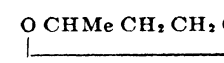
lactobiose Lactose

lactochrome $C_6H_{18}O_6N$ = 200 2 A coloring matter isolated from milk

lactocrit Lactokrit An instrument for determining the amount of fat in milk

lactoflavin $C_{17}H_{20}N_4O_6$ = 376 15 *6 7*-Dimethyl-*9*-isoalloxazine A flavin (q v) pigment, m 287, from milk alfalfa, clover and green leaves identical with vitamin B_2, q v Orange-red needles, giving, in water, a yellow solution with green fluorescence

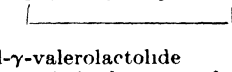
lactol (1) $C_{13}H_{12}O_3$ = 216 1 Lactonaphthol, naphthyl lactate, $MeCHOHCOOC_{10}H_7$ Colorless crystals, insoluble in water, soluble in alcohol, used as an intestinal antiseptic (2) The cyclic form of hydroxy aldehydes (aldolactols) and hydroxy ketones (ketolactols), as,



γ-valerolactol or pentanol-3-al-*1*

lactolactic acid Dilactic acid

lactolide The ether of a lactol, as,

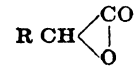


methyl-γ-valerolactolide

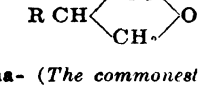
lactometer A hydrometer for determining specific gravity of milk

lactonaphthol Lactol

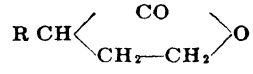
lactone An anhydro-ring compound produced by intramolecular condensation of an oxyacid with the elimination of water (*e g* , α- or **alpha-** (*The least common type*) The triatomic ring



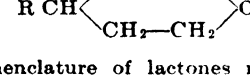
β- or **beta-** (*A less uncommon type.*) The tetratomic ring



γ- or **gamma-** (*The commonest and most stable type*) The pentatomic ring



δ- or **delta-** The hexatomic ring



The nomenclature of lactones is derived by either (a) adding -olid to the hydrocarbon, or (b) lactone to the acid, as

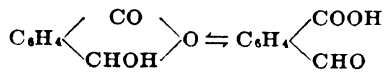
(gamma lactones)

CH_2 CH_2 CH_2 CO O = γ-butyrolactone or butanolid

CHMe CH_2 CH_2 CO O = γ-valerolactone or 1 4-pentanolid

CHEt CH_2 CH_2 CO O = γ-caprolactone or 1 4-hexanolid

(delta lactones)
$CH_2\ CH_2\ CH_2\ CH_2\ CO\ O$ =
δ-valerolactone or 1 5-pentalolid
$CHMe\ CH_2\ CH_2\ CH_2\ CO\ O$ =
δ-caprolactone or 1 5-hexanolid
l isomerism. The shift from lactone to aldehyde-acid, as,



lactonic acid Galactonic acid
lactonitrile C_3H_5NO = 71 05 *2*-Hydroxypropanenitrile*, Me CHOH CN A colorless liquid, d 0 992, m −40, b 183
lactose $C_{12}H_{22}O_{11}\ H_2O$ = 360 2 Milk-sugar, sugar of milk, lactobiose, glucose-galactoside A disaccharide occurring in milk Colorless rhombic, crystalline powder, d 1 525, m 203 (decomp), slightly soluble in water, insoluble in alcohol or ether Used extensively in pharmacy (for tablets), medicine (as nutrient), and industry **l -litmus-agar** A culture medium for growing certain bacteria, consisting of

10 gm lactose
15 gm agar-agar
10 gm peptone
1000 cc boullion stock

to which is added azolitmin solution and the whole neutralized with sodium hydroxide to a pale blue color
actoxime Lactazone An unsaturated lactam, or a compound containing the —CH=N—O— C O— group in the ring
actucarium The dried milky juice of *Lactuca virosa*, wild lettuce, a Compositae It is a mild narcotic and sedative
actucerol $C_{15}H_{30}O$ = 262 23 An alcohol from *Lactuca* species Cf *sycoceryl alcohol*
actyl The monovalent acyl radical $CH_3\ CHOH$-CO— derived from lactic acid **l lactate** Dilactic acid **l urea** $C_4H_6O_2N_2,H_2O$ = 132 11
The heterocyclic compound $CO\langle^{NH\ CH\ CH_3}_{NH\ CO}$
Colorless rhombic crystals, m 145, soluble in water, alcohol, or ether
ladanum Labdanum **l oil** An essential oil distilled from the resin of *Cistus creticus*, a Cistaceae of the Mediterranean Islands A yellow oil, d 1 01, insoluble in water, soluble in alcohol, ether or chloroform, used in perfumery
Ladenburg, Albert 1842–1911 A German chemist noted for research on alkaloids and organic compounds of silicon **L flask** A distilling flask, with several bulbs in its long neck, used for fractional distillation **L formula** See *benzene structure* **L law** The velocity of a photoelectron is proportional to the square root of the voltage exciting it
ladle A vessel or pot for holding, transporting and pouring molten metal.
lady's slipper Cypripedium
læ- See *lae-, le-*
laevo- Levo-
laevulinic acid Levulinic acid
laevulose Fructose
Lafayette mixture Mixture copaiba
lag (1) To drag or follow behind (2) To bind a pipe conducting steam with a non-conducting material (as asbestos), to keep it hot and prevent the steam condensing **magnetic-** See *hysteresis* **nitrogen-** See *nitrogen*
lagam balsam A thick yellow liquid resembling copaiba balsam
lagoriolite $3Na_2O\ Al_2O_3\ 3SiO_2$ A silica mineral (q v) of the garnet group
lake An adsorption compound of a vegetable or animal coloring material with aluminum oxide or other metallic oxide, produced by coprecipitating the color with the corresponding metallic salts (mordants) Lakes are usually bright in color and insoluble, but the same dye can give different shades with different mordants, *e g* , alizarin produces with

aluminum and tin—reddish shades
calcium or barium—bluish shades
ferric salts—purplish shades
chromium —violet-brownish shades

lakh (1) Lac (2) In India = 100,000
laking Hemolysis
lamb An abbreviation for lambert
Lamb, Arthur Becket 1880– An American chemist, noted for research in inorganic chemistry
lambda The Greek letter Λ or λ (L, l) The symbol for (1) microliter, (2) latent heat of reaction, (3) wavelength, (4) lithium nucleus, (5) equivalent conductivity
lambert Lamb A unit of brightness of a perfectly diffusing surface, which radiates or reflects one lumen per square centimeter 1 lamb = 1 phot = 1 lumen per cm^2 = 0 3183 candles per cm^2 = 2 054 candles per in^2
Lambert's law Each layer of an absorbing medium of equal thickness absorbs an equal fraction of the radiation which traverses it, provided the medium is homogeneous $I = I_0e^{-al}$, where I_0 and I are the intensities of the incident and emergent radiations, respectively, of rays of light of a wave-length λ, e the thickness of the transmitting medium in cm , and a the absorption coefficient (q v) of the medium for the wave-length λ
Lambrecht's polymeter. A meteorological measuring instrument, consisting of a hygrometer and thermometer with humidity conversion scales
lamella (1) A medicated disk or wafer (2) Lamina
lamina A thin flat plate or scale, as mica
Laminaria Tangle, seagirdle A genus of *Phaeophyaceae* or algae of the brown sea-weed type, order Laminariaceae Cf *kelp*
laminated Split, or arranged in thin layers
lamine An alkaloid obtained from the blossoms of *Lamium album*, dead-nettle, a Labiatae
lamp A device for obtaining light or heat **alcohol-** A small vessel with wick, for burning alcohol **arc-** See *arc* **blast-** See *burner* **carcel-** See *carcel unit* **electric-** A device for transforming an electric current into light Three types arc l , filament l , and vacuum l **filament-** A device for heating a thread of carbon, tantalum, or tungsten to incandescence in an evacuated glass bulb The temperature and brightness of some filament l are

50 Watt carbon	1840°C	3 3 lumens per watt
50 Watt tantalum	1885°C,	4 9 lumens per watt
50 Watt tungsten (gas-filled)	2425°C,	11 1 lumens per watt

gas-filled- (1) Vacuum l (2) A filament l which contains a small quantity of gas *e g*, N_2 or A **halide-** See *halide lamp* **Harcourt-** A standardized device for burning a definite quantity of pentane at a definite rate, used as standard of illumination in measuring brightness **Hefner-** A standard lamp used in photometry **Kromayer's-** A mercury arc in a quartz container, which produces actinic rays **mercury-** An evacuated glass or quartz container containing mercury vapor, on the passage of an electric current it emits an intense bluish light which is rich in ultraviolet or actinic rays It is used in spectroscopy and photography **microscope-** An electrical illuminating device for microscopes **mignon-** A small electric lamp for examining tissues, or organs **miner's-** q v **neon-** A vacuum type lamp containing a trace of neon **Nernst-** An electric lamp with metal oxide filament, which becomes a conductor when heated **pentane-** A lamp burning pentane, used as photometric standard **quartz-** A mercury vapor lamp made of quartz **spectrum-** A device for coloring a non-luminous flame with vapors, sprays or solid particles, used for the production of spectra of metals **vacuum-** An illuminating device consisting of a vacuum tube variously shaped in form of letters or ornaments through which passes an electric current Different gases used as the residual gas in the tubes, produce different colors

lampblack Carbon black Paris black Finely-divided carbon obtained by burning gas or oil under a slowly rotating metal cylinder Used as a paint printer's ink and paper pigment, after removal of the oily impurities Cf *soot*

lamprobolite A basaltic hornblende

lana Wool Flannel

lanain, lanalin Lanolin

lanarkite A native, basic lead sulfate, $PbSO_4 \cdot PbCO_3$, derived from $PbSO_4$ PbO

lancet A small pointed knife with two edges

land plaster Gypsum

Landmark process The synthesis of ammonia by passing steam over TiN_2 and carbon, and the recovery of TiN_2

(1) $2TiN_2 + 2C + H_2O \rightarrow 2TiN + CO + 2NH_3$
(2) $N_2 + 2TiN \rightarrow 2TiN_2$

Landolt, Hans Heinrich 1831–1910 A Swiss physical chemist, noted for his work on optical refractivity

Landsberger apparatus An apparatus for the determination of molecular weights from the rise in boiling-point of a solution

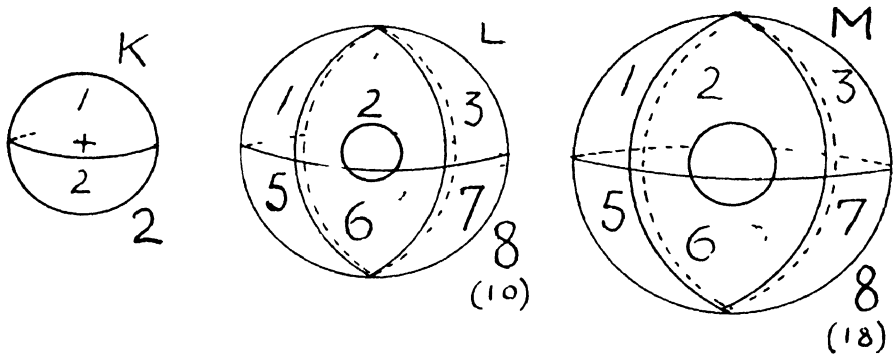
lanesin Lanolin

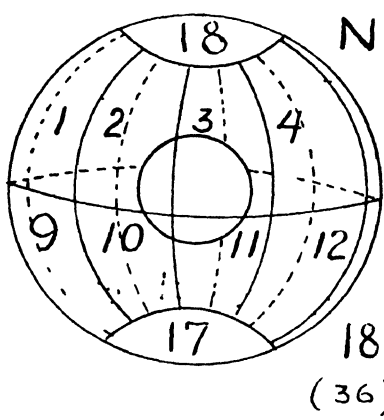
langbeinite A native potassium-magnesium sulfate, $K_2SO_4\ 2MgSO_4$

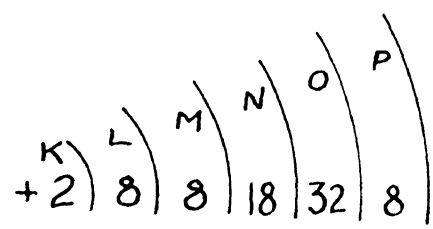
Lange solution A colloidal solution of gold

Langevin formula The activity coefficient, α, of ions or the coefficient of combination of ions is $\alpha = \Lambda_0/\kappa$, where Λ_0 is the equivalent conductivity and κ the dielectric constant per volt

Langmuir, Irving 1881– An American physical chemist noted for experiments on atomic hydrogen low pressure and high vacuum reactions and development of theories of isosterism and atomic structure Cf *Lewis-Langmuir theory* **L theory** (1) An extension of Lewis atomic theory Electrons occupy







Langmuir theory

positions in the imaginary shells around the atom (see original figure) The white central disk represents the shell, and the numbers indicate the electrons added when passing from one element to the other See *periodic system* (2) In the solid state secondary valencies supplant the effect of primary valences

anital An artificial wool produced in Italy from casein Cf *aralac*

lanoceric acid $C_{30}H_{60}O_4$ = 484 46 A dibasic fatty acid, m 105, from lanolin, constituent of wool grease

lanolin Lanum, lanain, lanalin, lanesin, lanichol, laniol, adeps lanae hydrous, hydrous wool fat A purified and hydrated wool fat, used as an excipient for external use, and in cosmetics **anhydrous-** Adeps lanae, wool fat A yellowish semi-solid fat from sheep's wool, consisting of cholesterol esters of higher fatty acids, m 38–42 soluble in alcohol, ether or benzene

lanopalmic acid $C_{15}H_{30}O_3$ = 358 2 A fatty acid from wool grease

lanosterol $C_{30}H_{50}O$ (?) Isocholesterol An unsaturated sterol closely related to cholesterol, m 139–140, comprising approximately 25 % of wool wax, q v

lantanine An alkaloid from *Lantana brasiliensis*, a Verbenaceae of Brazil, used as an antiperiodic, antipyretic and quinine substitute Cf *yerba sagrada*

lanthanite The dull, infusible mineral $La_2(CO_3)_3 9H_2O$

lanthanum La = 138 92 A rare earth metal atomic number 57 discovered in 1839 by Mosander A lead-gray lustrous metal, d 6 15, m 810, found in the rare earth minerals cerite, samarskite, lanthanite and gadolinite It decomposes water slowly, and has a valency of three, not at present used in industry or medicine, but forms pyrophoric alloys and can be used as a catalyst in ashing biological material **l acetate** $La(CH_3COO)_3 1\frac{1}{2}H_2O$ = 343 01 White crystals, soluble in water **l carbonate** $La_2(CO_3)_3 8H_2O$ = 602 1 A white crystalline powder, insoluble in water, soluble in dilute acids **l chloride** $LaCl_3 7H_2O$ = 371 4 White transparent triclinic crystals, soluble in water or alcohol **l nitrate** $La(NO_3)_3 6H_2O$ = 433 1 White transparent, deliquescent crystals, m 40, b 126, soluble in water or alcohol Used as an antiseptic, and for incandescent gas mantles **l oxalate** $La_2(C_2O_4)_3$ = 451 8 A white crystalline powder, insoluble in water **l oxide** La_2O_3 = 325 8 An amorphous, infusible, white powder, d 6 41, insoluble in water, soluble in acids and ammonium chloride solutions Used in incandescent gas mantles, and for "lime-lights" **l sulfate** $La_2(SO_4)_3 9H_2O$ = 727 9 Colorless, hexagonal needles, d 2 81, slightly soluble in water, decomp when heated **l sulfide** La_2S_3 = 374 02 A yellow powder, d 4 997, m 2300–2350, insoluble in water

lanthopine $C_{20}H_{25}O_4N$ = 343 20 Lantol A colorless crystalline alkaloid of opium, m 200

lantol Lanthopine

lanum Lanolin

lapacho bark The bark of *Avicennia nitida*, black mangrove, used for tanning **l wood** The heart wood of *Avicennia tomentosa*, a Verbenaceae of the tropics

lapachoic acid Lapachol

lapachol $C_{15}H_{14}O_3$ = 242 11 Lapachoic acid targusic acid, 2-hydroxy-3-amylene-α-naphthoquinone A constituent of lapacho wood, m 141

lapis (1) The Latin term for stone (2) An alchemical term applied to any non-volatile substance **l albus** A native calcium silicofluoride **l amiridis** Emery **l calaminaris** Calamine **l causticus** Fused sodium or potassium hydroxide **l divinus** Cuprammonium **l imperalis** Silver nitrate **l lazuli** (1) A mixture of minerals usually calcite, pyrite lazulite, sodalite and hauyenite (blue Na, Al silicates), which were the source of the ancient ultramarine (2) A native copper silicate, translucent deep blue, green, or purple compact masses Used as semi-precious stone for ornaments vases, or jewelry **l lunaris** Fused silver nitrate

lappa Burdock, clotbur, bardana The dried roots of *Arctium lappa*, a Compositae, used as the fluid extract, as a diuretic and diaphoretic

lappaconitine (1) $C_{32}H_{44}O_8N_2$ = 584 32 An alkaloid of *Aconitum septentrionale*, a Ranunculaceae m 205 (2) $C_{32}H_{42}N_2O_9$ = 598 34 An alkaloid, m 223

larch The bark of *Larix Europaea* (*Pinus larix*), a Coniferae, used as astringent and diuretic, it contains larixine **American-** or **black-** Tamarac **European-** Larch **l agaric** Agaric **l extract** An extract obtained by leaching the bark of *Pinus larix*, it is rich in tannin and is used in the tanning industry

lard Adeps The purified abdominal fat from the hog A white, granular mass, insoluble in water, soluble in alcohol, ether or chloroform Used in cooking and pharmaceutical preparations **l benzoinated** Adeps benzoinatus Lard containing 1 % of benzoin Used as mild antiseptic and ointment base **l oil** A colorless oil, chiefly triglycerides of oleic acid, pressed from lard, d 0 915, soluble in alcohol, ether or chloroform Used as lubricant, and illuminant

lardacein A wax, d 0 6969, m 55, from the scale of *Ceroplastens rubens*, an insect living on tea and citrus trees

lardine A substitute for lard prepared by hydrogenating cottonseed oil

large calorie Great calorie The amount of heat required to raise the temperature of **1 kg** water from 14 5°C to 15 5°C 1 large calorie (Cal) equals 1000 small calories (cal) See *calorie*

Larix A genus of Coniferae yielding timber, oils, and resin

L Americana	tamarac
L cedrus	cedrus
L Europaea	larch

larixine $C_{10}H_{10}O_5$ = 210 1 Larixinic acid A principle obtained from larch bark, *Larix europaea*, a Coniferae Long, white lustrous crystals of empyreumatic odor and bitter astringent taste, m 153, soluble in water, alcohol or ether

larkspur Delphinium A ranunculaceous plant **l seeds** The dried seeds of *Delphinium* species used as a fluid extract, as an antiparasitic and diuretic

Larmor, Sir Joseph 1857–1942 A British physicist, noted for his work on the electrical structure of matter

larodon $C_{14}H_{18}N_2O$ = 230 2 *1*-Phenyl-*2 3*-dimethyl-*4*-isopropyl pyrazolone White crystals used as an analgesic

larosan. A calcium caseinate, used as an addition to infants' milk.

larvicide. An agent that destroys larva, the first stage of development of insects after hatching.

latent. Not manifest or readily obtainable. Lying hidden. **l. energy, l. force.** Potential energy. **l. heat.** The amount of heat required to change the state of a body from solid to liquid at its melting point, or from liquid to gas at its boiling point. Likewise the quantity of heat liberated if a gas changes to a liquid, or a liquid to a solid, at its condensation or freezing point, respectively. **l. h. of fusion.** The number of gram-calories required to convert 1 gram of a substance from solid into liquid, without a change of temperature. **l. h. of vaporization.** The number of gram calories required to convert 1 gram of substance from liquid into vapor without a change of temperature. **l. image.** The invisible change produced on a photographic plate by exposure to light. It is made visible by exposure, and is due to the effect of light on AgBr, which is changed to excited molecules, Ag^*Br^* or Ag_2Br.

lateral chain. See *chain.*

laterite. A hydrated oxide of iron and aluminum, and sometimes titanium (cf. bauxite), which occurs as a brown surface earth.

latex. The milky juice of plants, or the exudation of trees, shrubs or vines obtained by tapping the trunk. **rubber-** A colloidal emulsion of 33 % rubber (q.v.), d.0.983, p_H 7.0–7.2.

lather. A foam or froth of soap and water.

lathering power. The relative amount of froth formation of soap solutions. Sodium oleate promotes, sodium palmitate retards the foam production.

lattice. See *space lattice.*

laucaniline. Paraleucoaniline.

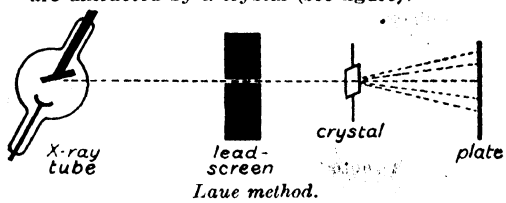
laudanidine. $C_{20}H_{25}NO_4$ = 343.3. Tritopine, *l*-laudanine. An alkaloid from opium. Hexagonal prisms, m.166.

laudanine. $C_{20}H_{25}O_4N$ = 343.3. An alkaloid from opium. **dl-** Small colorless prisms, m.166, insoluble in water, soluble in alcohol, ether or benzene; used as a strychnine substitute. **l-** Laudanidine.

laudanosine. $C_{21}H_{27}O_4N$ = 357.3. N-methyltetrahydro-papaverine. An alkaloid from opium. A yellow-white crystalline powder, m.89, insoluble in water, soluble in alcohol, ether, or benzene.

laudanum. Tincture of opium. A brown solution of opium in alcohol; used as a powerful anodyne.

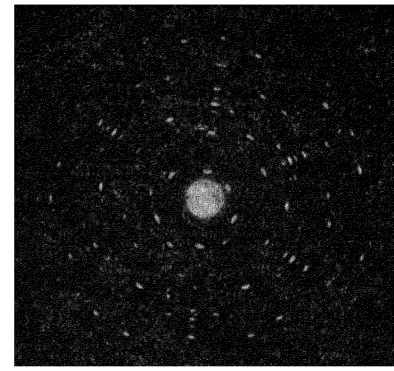
Laue, Max von. A German physicist, noted for research on subatomic phenomena. **L. diagram.** L. pattern. **L. method.** The diffraction of x-rays by means of a crystal. **L. pattern.** The photographic record produced when x-rays are diffracted by a crystal (see figure).



Laue method.

laughing gas. Nitrous oxide.

laumonite. The vitreous mineral $CaO,Al_2O_3,4SiO_2.2H_2O$ (cf. *lawsonite*).



Laue pattern.

Showing the high temperature (hexagonal) form of Al_2O_3, taken with the X-ray beam nearly normal to the (0001) planes (Huggins).

Lauraceae. Laurel family, a group of aromatic shrubs or trees, all parts of which yield an essential oil.

Cinnamomum camphora.....	camphor
	camphor oil
	camphor wood oil
Cinnamomum zeylanicum....	Ceylon cinnamon
	cinnamon oil
Cinnamomum cassia.....	cassia bark
	cassia oil
Sassafras variifolium.....	sassafras bark
	sassafras oil
	sassafras wood
Nectandra rodiaei.....	bebeeru bark
Nectandra puchuri.....	pichurim beans
Lindera benzoin.....	spice bush
Laurus nobilis.....	sweet bay
	laurel oil
Umbellularia californica.....	California laurel

lauraldehyde. Lauric aldehyde.

laurane. $C_{20}H_{42}$ = 282.32. An isomer of eicosane in laurel fat, m.69.

laurel. Laurus, sweet bay, bayberry, noble berry. The dried leaves and berries of *Laurus nobilis*, used for making laurel oil. **cherry-** See *prune.* **ground-** Arbutus. **mountain-** Kalmia. **New Zealand.** See *pukateine.*

l. berries oil. An essential oil from the fruits of l., soluble in alcohol, and containing pinene, cineol, eugenol and methylchavicol. **l. camphor.** Camphor. **l. fat.** Bay oil, l. oil. A soft, buttery fat, m.32–36, obtained by pressing l. leaves. It contains trilaurin, olein, laurane, etc. and is used in veterinary work. **l. leaves oil.** Bay leaves oil. A bright yellow essential oil distilled from laurel, d.0.924, insoluble in water, soluble in alcohol or ether. Used in medicine and in flavoring extracts. **l. oil.** (1) L. fat. (2) L. leaves oil. **l. tallow.** Undung. **l. wax.** (1) Myristin. (2) Bayberry wax.

laureline. $C_{17}H_{17}NO_3$ = 283.1. An apomorphine alkaloid from *Laurelia Novae Zealandicae*, a Monimiaceae. Cf. *pukateine, corytuberine.*

laurene. Pinene.

Laurent, Auguste. 1807–1853. A French organic chemist, discoverer of phthalic acid, aniline, caffeine, naphthalene and their derivatives. Noted for his theory of types and

radicals. **L. acid.** 1.5-Nitronaphthalene sulfonic acid.

lauric acid. $C_{12}H_{24}O_2$ = 200.3. Nonylacetic acid, dodecanoic acid*, 1-hendecanecarboxylic acid, $Me(CH_2)_{10}COOH$. A fatty acid derived from laurel and spermaceti. Colorless needles, d.0.864, m. 47, b.$_{100mm}$.225, insoluble in water, soluble in alcohol or ether. **hydroxy-** Sabinic acid.

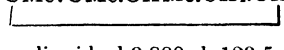
lauric aldehyde. $C_{12}H_{24}O$ = 184.3. Dodecanal*, lauraldehyde. The aldehyde of lauric acid. Colorless leaflets, m.44.5, b.$_{100mm}$185, insoluble in water, soluble in alcohol or ether.

laurin. $C_{39}H_{74}O_6$ = 638.57. Trilaurin. $C_3H_5(C_{12}H_{23}O_2)_3$, laurostearin, glyceryl laurate. A glyceride of lauric acid in the seeds of laurel, palms, coconuts; white needles, d.0.891, m.46.5; used to prepare medicinal soaps.

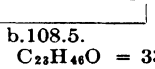
laurite. A native sulfide of ruthenium, RuS_2.

lauroleic acid. $C_{12}H_{22}O_2$ = 198.2. Dodecenoic acid*. An unsaturated acid, b.$_{2mm}$90, from the head oil of the sperm whale.

laurolene. C_8H_{14} = 110.11. 1.2.3.-trimethyl-1-cyclopentene. The hydrocarbon



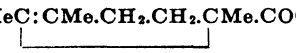
A colorless liquid, d.0.800, b.120.5. **iso-** 1.1.2-trimethyl-2-cyclopentene. The hydrocarbon, $CMe_2.CMe{:}CH.CH_2.CH_2$. A colorless liquid,



d.0.791, b.108.5.

laurone. $C_{23}H_{46}O$ = 338.35. *12*-Tricosanone*. The ketone, $(C_{11}H_{23})_2CO$. Colorless crystals, d.0.789, m.69.

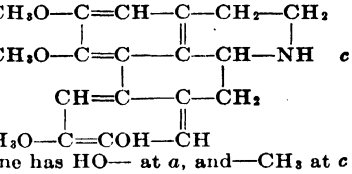
lauronolic acid. $C_9H_{14}O_2$ = 154.11. Laurolene-3-carboxylic acid.



A colorless liquid, d.1.016, m.6, b.$_{14mm}$135.

laurostearin. Laurin.

laurotetanine. $C_{19}H_{21}O_4N$ = 345.2. A strychnine-like alkaloid from the bark of *Litsea latifolia* a Lauraceae of southern Asia. Cf. *glaucine*.



boldine has HO— at *a*, and —CH_3 at *c*

actinodaphnine has $CH_2<^{O-}_{O-}$ at *a*, *b*, and —CH_3 at *c*

lauroyl. See *lauryl* (2).

laurus. Laurel.

lauryl. (1) The monovalent radical $C_{12}H_{25}$—, derived from dodecane. (2) The group $Me(CH_2)_{10}CO$—, drived from lauric acid, more properly termed lauroyl. **l. alcohol.** $C_{12}H_{26}O$ = 186.20. *1*-Dodecanol*, *n*-dodecyl alcohol. $Me(CH_2)_{11}OH$. White leaflets, d.0.8309, m.-22.6, b.255, insoluble in water. **l. bromide.** $C_{12}H_{25}Br$ = 249.11. *1*-Bromododecane*, dodecyl bromide, $Me(CH_2)_{11}Br$. A colorless liquid, b.$_{45mm}$177. **l. chloride.** $C_{12}H_{25}Cl$ = 218.64. *1*-Chlorododecane*, dodecyl chloride, $Me(CH_2)_{11}Cl$. A colorless liquid, m.−17, b.$_{18mm}$145.

laurylene. (1) $C_{12}H_{24}$ = 168.2. An unsaturated hydrocarbon in mineral oils. (2) $C_{10}H_{16}$ = 136.12. A terpene from laurel oil.

lautal. A hard aluminum alloy containing 4–5 % Cu, 1.5–2 % Si and 0.4–0.7 % Fe.

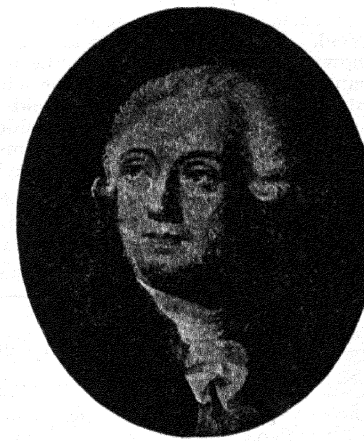
Lauth's violet. Thionine.

lava. The molten and solidified magma ejected from volcanoes.

lavandula. Lavender.

lavender. The dried flowering tops of *Lavandula latifolia;* used as a tincture or fluid extract as a tonic, carminative and stimulant. **l. flower oil.** A colorless essential oil distilled from lavender flowers, d.0.885, insoluble in water, soluble in alcohol, ether, or benzene and used in perfumery. **l. spike oil.** An essential oil distilled from the herb *Lavandula officinalis*. A colorless liquid, d.0.905; insoluble in water, soluble in alcohol, ether, or chloroform. Used in liniments and pharmaceutical preparations.

Lavoisier, Antoine Laurent. 1743–1794. A French chemist, regarded as the founder of



Antoine Laurent Lavoisier.

(From Brownlee, Fuller and Hancock "Elementary Chemistry." Courtesy of Allyn & Bacon.)

modern chemistry by virtue of his study of combustion and the role of oxygen. He formulated the theory of the conservation of matter, and laid the basis for chemical nomenclature. He was unjustly accused and executed during the French revolution.

law. A generalized statement of facts or principles. **empirical-** A l. which is the result of experience without theoretical considerations. **natural-** The formulation of systematized experience as to the workings of nature. Science concerns itself mainly with the effects caused by varying conditions, and therefrom deduces theories of the "modus operandi." **periodic-** (1) A l. which expresses a periodic variation. (2) See *periodic system.*

Law cell. An electric cell (1.37 volt) consisting of a zinc anode, and carbon cathode in a 15 % solution of ammonium chloride.

lawang oil. An oil from the bark of an East Indian plant, resembling mace oil.

lawsone. $C_{10}H_6O_3$ = 174.1. Hydroxynaphthoquinone. The coloring matter of henna leaves,

Lawsonia alba Fine red needles, m 194, used as a hair dye, it is a constituent of henna, q v

lawsonite A vitreous, colorless mineral, $CaO \cdot Al_2O_3,2SiO_2\ 2H_2O$ Cf *laumonite*

laxative A mild cathartic, such as petrolatum or milk of magnesia

layer A mass of uniform thickness covering an area **molecular-** A film of single molecules alongside each other over the surface of a liquid or solid Cf *zone*

lazulite $(MgFeCa),(AlOH)_2P_2O_8$ A blue, vitreous mineral

lb An abbreviation for pound or pounds, *lbs* is incorrect **lb ap** An abbreviation for apothecary's pound **lb av** An abbreviation for avoirdupois pound **lb t** An abbreviation for troy pound

leaching The process of washing or extracting the soluble constituents from insoluble material, as of sodium nitrate from caliche, or the extraction of coloring matter or tanning materials from plant tissues

lead (1) Pb = 207 21 Plumbum A metallic element, atomic number 82 A gray, soft, monoclinic or regular crystalline metal, d 11 34, m 327, b 1470, insoluble in water, soluble in nitric acid **Its principal ore is galena Lead was known to the Romans under the name of plumbum nigrum It is used for chemical apparatus and machinery (lining acid tanks, water pipes), in electrotechnics, as a solder, and in low melting point alloys Lead forms three series of compounds, and has two valencies**

+2	+4	+4
plumbous	plumbic	plumbate
Pb^{++}	Pb^{++++}	PbO_3^{--}

ISOTOPIC COMPOSITION OF LEAD

	1	*2*	*3*	*4*
A W	207 17	206 02	207 85	206 08
I W	%	%	%	%
203	0 04			
204	1 50			
205	0 03			
206	27 75	93 3	4 6	89 9
207	20 20	6 7	1 3	7 9
208	49 55	0 02	94 1	2 3
209	0 85			
210	0 08			

1 Common lead of atomic weight 207 17

2 Lead from Katanga pitchblende and Morogoro uranite, A W 206 02 (RaG is 206)

3 Lead from Norwegian thorite, A W 207 85 ThD is 208)

4 Lead from Great Bear Lake pitchblende, A W 206 08 (AcD is 207)

Lead salts are all poisonous Metallic lead consists of several isotopes of different atomic weights (see *isotopes, radioactive elements* and table) **actinium-** Actinium D **antimonial-** See *antimonial* **argentiferous** (1) A lead ore, PbAgS (2) An alloy of silver and lead obtained in the cupellation process **black-** Graphite **brown-** Vanadinite **horn-** Phosgenite **pyrophoric-** Lead in a finely-divided state, which oxidizes spontaneously with a glow on exposure to air **radio-** The natural radioactive mixture of lead isotopes **red-** L tetroxide **secondary-** Lead recovered from scrap **thorium-** Thorium D **white-** L carbonate **uranium-** Radium G (2) A conduit or vein which is being followed, cf l wire

l accumulator A reversible voltaic storage cell (2 2 volts) consisting of an anode of lead and a cathode of lead dioxide, suspended in sulfuric acid of d 1 1 **l acetate** $Pb(C_2H_3O_2)_2 \cdot 3H_2O$ = 379 3 Lead sugar, sugar of lead, plumbous acetate Colorless efflorescent crystals, d 2 50, m 75, b 280, soluble in water Used as a reagent for chromic and molybdic acids, tannin, oxalic, and malic acids, detection of hydrogen sulfide, manufacture of lead salts, as a mordant in dyeing, in the tanning industry and in the preparation of white lead paints **l acetate, basic** L subacetate **l acetotartrate** Colorless crystals, soluble in water, used as an astringent and antiseptic **l alkyles** Organic compounds of tetravalent lead and alkyl-radicals, as

lead tetramethide $PbMe_4$
lead tetraethide $PbEt_4$
dilead triethide $PbEt_3$—$PbEt_3$
lead triethylhydroxide Et_3PbOH

Some are used as anti-knock compounds **l alloys** Alloys containing lead, they usually have low melting points

	Lead				
	90 %	80 %	70 %	60 %	50 %
with	10 %	20 %	30 %	40 %	50 %
Sn	295°C	276°C	262°C	240°C	220°C
Bi	290°C			179°C	145°C
Te	710°C	790°C	880°C	917°C	760°C
Sb	250°C	275°C	330°C	393°C	440°C
Cu	870°C	920°C	925°C	945°C	950°C
Ag	460°C	545°C	590°C	620°C	650°C
Na	360°C	420°C	400°C	370°C	330°C

Other important lead alloys are

type metal 82 % Pb, 15 % Sb, 3 % Sn
solder 67 % Pb, 33 % Sn
carbox metal 84 % Pb, 14 % Sb, 0 6 % Fe 0 7 % Zn, 0 6 % Sn

Cf *pewter, linotype metal, solder*

l antimoniate $Pb_3(SbO_4)_2$ = 993 1 Plumbous antimoniate, Naples yellow, plumbous stibnate, giallioline An orange-yellow powder insoluble in water, used as a pigment in oil paint, ceramic, crockery and glass industries **l arsenate** $Pb_3(AsO_4)_2$ = 899 6 Plumbous arsenate Colorless, very poisonous crystals insoluble in water, soluble in nitric acid, used as an insecticide **l aryles** An organic compound of tetravalent lead and an aryl radical, *e g*, lead tetraphenyl $PbPh_4$ **l azoimide** L nitride **l benzoate** $Pb(C_7H_5O_2)_2$ = 449 3 Plumbous benzoate Colorless crystals, slightly soluble in water **l bichromate** $PbCr_2O_7$ = 423 2 Plumbous bichromate A brick-red powder, insoluble in water, used as pigment **l bioxide** L peroxide **l bitannate** L tannate **l black** Graphite **l borate** $Pb(BO_2)_2 \cdot H_2O$ = 311 2 Plumbous borate, lead drier A white powder, d 5 59, insoluble in

water, soluble in nitric acid, used as a drier in paints and pigments 1 **borosilicate** A mixture of the borate and silicate of lead, a constituent of optical glass 1 **bromate** $Pb(BrO_3)_2$ = 463 2 Plumbous bromate Colorless crystals, slightly soluble in hot water 1 **bromide** $PbBr_2$ = 367 0 A colorless, rhombic crystalline powder, d 6 57, m 380, decomp 448, insoluble in water or alcohol 1 **butyrate** $Pb(C_4H_7O_2)_2$ = 381 2 Plumbous butyrate Colorless scales, m 90, insoluble in water 1 **carbolate** L phenate 1 **carbonate** $PbCO_3$ = 267 2 Plumbous carbonate A white powder, d 6 47, decomp on heating, insoluble in water, used as a pigment Native as cerusite Cf *Dutch process* 1 **carbonate, basic** $2PbCO_3\ Pb(OH)_2$ = 775 6 Plumbous subcarbonate basic 1 carbonate white lead, ceruse, cerussa, lead flakes A white, heavy powder decomp on heating, insoluble in water Used as a pigment and in putty, medicinally, as constituent of ointments for burns and inflamed surfaces 1 **chamber** See *sulfuric acid manufacture* 1 **chlorate** $Pb(ClO_3)_2$ = 374 1 Plumbous chlorate d 4 037 White monoclinic crystals, soluble in water, decomp 230 Cf *Thiel*-Stoll solution 1 **chloride** $PbCl_2$ = 278 1 Plumbous chloride Colorless rhombic crystals, d 5 80, m 501, b 861, insoluble in water, used as a reagent for silver, alkaloids and carbonates, and mixed with lead oxides, as pigment 1 **chromate** $PbCrO_5$ = 323 2 Plumbous chromate, Leipzig yellow, Paris yellow, "chrome" yellow Fusible, yellow monoclinic crystals, d 6 123, insoluble in water, used as a reagent in organic analysis, as a pigment, and in the textile industry 1 **chromate basic** $PbCrO_4\ PbO$ = 546 4 Plumbous subchromate, basic 1 chromate Red crystals, insoluble in water, used as a pigment 1 **citrate** $Pb_3(C_6H_6O_7)_2$ = 1001 76 Plumbous citrate A colorless crystalline powder, soluble in water 1 **cyanate** $Pb(CNO)_2$ = 291 24 Plumbous cyanate A colorless crystalline powder, insoluble in water, decomp on heating 1 **cyanide** $Pb(CN)_2$ = 259 2 Plumbous cyanide A colorless crystalline powder, insoluble in water, soluble in potassium cyanide solution, used as an insecticide and in metallurgy 1 **dichromate** L bichromate 1 **dioxide** L peroxide 1 **dish** A container made of metallic lead, used for corrosive liquids and hydrofluoric acid, as, in glass etching 1 **dithiofuroate** $(C_4H_3O\ CS_2)_2Pb$ Furac III A red powder, used as accelerator in vulcanization 1 **drier** L borate 1 **dust** Finely powdered metallic lead 1 **ethylsulfate** $Pb(C_2H_5SO_4)_2\ H_2O$ = 475 46 A colorless liquid, soluble in water, used in organic synthesis 1 **ferrocyanide** $Pb_2Fe(CN)_6$ = 626 5 Plumbous ferrocyanide A yellowish powder, insoluble in water 1 **flake** L carbonate basic 1 **fluoride** PbF_2 = 245 2 Plumbous fluoride d 8 241 A fusible white powder, insoluble in water 1 **fluosilicate** $PbSiF_6$ = 349 28 L silicofluoride *dihydrate* $2H_2O$ White monoclinic prisms, soluble in water *tetrahydrate* $4H_2O$ Monoclinic crystals, soluble in water 1 **flux** A reducing and desulfurizing agent used in the assay of gold and silver, and consisting of 16 pts $NaHCO_3$, 16 pts K_2CO_3, 8 pts flour, 4 pts borax glass 1 **formate** $Pb(CHO_2)_2$ = 297 2 Plumbous formate Lustrous rhombic needles, d 4 63, decomp 190, soluble in water used as a reagent 1 **hydrate** See *l hydroxide* 1 **hydroxide** (1) $Pb(OH)_2$ = 241 2 Plumbous hydroxide, 1 hydrate A white powder d 7 59, m 145 (decomp), slightly soluble in water, soluble in acids or alkalis (2) $3PbO,\ H_2O$ = 687 6 White cubic crystals 1 **hypophosphite** $Pb(H_2PO_2)_2$ = 337 2 A hygroscopic, white powder soluble in water 1 **hyposulfate** PbS_2O_6 = 367 2 Plumbous hyposulfate Colorless crystals soluble in water 1 **hyposulfite** PbS_2O_3 = 319 2 Plumbous hyposulfite, plumbous thiosulfate, 1 thiosulfate White crystals, which darken with age due to the formation of PbS, insoluble in water, soluble in alkali thiosulfate solutions, used in inorganic synthesis 1 **iodate** $Pb(IO_3)_2$ = 557 0 Plumbous iodate A colorless crystalline powder insoluble in water 1 **iodide** PbI_2 = 461 0 Plumbous iodide, plumbi iodidum Yellow, hexagonal crystals d 6 16, m 375, b 861, insoluble in water, soluble in hydroxides or iodide solutions Used in medicine as an astringent and resolvent, and technically, for bronzes, mosaic gold, printing and photography 1 **isotopes** See *radioactive elements* 1 **lactate** $Pb(C_3H_5O_3)_2$ = 385 2 Plumbous lactate A white powder soluble in water 1 **laurate** $(C_{12}H_{23}O_2)\ Pb$ = 605 58 White powder, m 104 7, insoluble in water 1 **linoleate** $Pb(C_{18}H_{31}O_2)_2$ = 765 7 Plumbous linoleate A yellowish paste, insoluble in water used in ointments and varnishes 1 **malate** $Pb(C_4H_4O_5)\ 3H_2O$ = 393 3 Plumbous malate A white powder slightly soluble in water 1 **minerals**

galena	PbS
clausthalite	PbSe
altaite	PbTe
massicot	PbO
minium	Pb_3O_4
plattnerite	PbO
cerussite	$PbCO_3$
phosgenite	$Pb_2Cl_2CO_3$
cotunnite	PbCl
anglesite	$PbSO_4$
crocoite	$PbCrO_4$
wulfenite	$PbMoO_4$
stolzite	$PbWO_4$

Cf *brongniardite, carminite, caryinite, lanarkite, plagionite, zinkenite*

1 **molybdate** $PbMoO_4$ = 367 2 Plumbous molybdate A yellow powder, insoluble in water, soluble in hot nitric acid, used as a reagent in analysis 1 **monosulfide** L sulfide 1 **monoxide** L oxide (yellow) See also *massicot* 1 **myristate** $(C_{14}H_{27}O_2)_2Pb$ = 661 64 White powder, m 108 6, insoluble in water 1 **naphthalene sulfonate** $Pb(C_{10}H_7SO_3)_2$ = 621 45 White crystals, insoluble in water soluble in alcohol 1 **nitrate** $Pb(NO_3)_2$ = 331 2 Plumbous nitrate Colorless octahedral crystals, d 4 531, decomp 223, soluble in water or alcohol Used as a reagent, as an astringent, deodorant and detergent in medicine, technically, in the manufacture of lead salts as a mordant in the dye and textile industries, as oxidizing agent in organic synthesis, in the manufacture of matches, as a sensitizer in photography and in the manufacture of pyrotechnic toys 1 **nitride** PbN_6 = 291 27 L azoimide Colorless crystals, exploding at 350 1 **nitrite** $Pb(NO_2)_2$ = 299 2 Plumbous nitrite Yellowish crystals, soluble in acids

l **oleate** $Pb(C_{18}H_{33}O_2)_2$ = 769 8 Plumbous oleate White fatty granules, insoluble in water, soluble in alcohol or ether, used in medicine for ointments, and in commerce for varnishes l **oxalate** PbC_2O_4 = 295 2 Plumbous oxalate A white, crystalline powder, d 5 03, decomp 300, insoluble in water l **oxide** (1) *L suboxide*, Pb_2O = 430 4 A black, amorphous powder, d 8 34, insoluble in water, decomp if heated (2) *Yellow monoxide*, PbO = 223 2 Plumbous oxide, litharge, massicot, lead protoxide A yellowish rhombic crystalline powder, d 9 37, m 888, insoluble in water, soluble in acids or alkalis Used as reagent, in ointments in manufacture of glass and pottery, for acid-resisting cements and putty, as pigment, and as filler in the rubber industry (3) *Red monoxide*, PbO = 223 2, plumbous oxide A hexagonal red crystalline modification of the yellow lead monoxide d 8 74, insoluble in water (4) *L sesquioxide*, Pb_2O_3 = 462 4 L trioxide, plumbous plumbite, l metaplumbate, PbO PbO_2 An amorphous reddish-yellow powder, used as a pigment It is probably lead meta-plumbate, PbO, PbO_2, since it is decomposed by acids into these oxides (5) *L oxide red* Pb_3O_4 = 685 6 Plumbous plumbate, l orthoplumbate, Pb_2PbO_4, red lead oxide, minium, sandix lead orthoplumbate lead tetroxide, plumbous-plumbic oxide, ($2PbO \cdot PbO_2$) A heavy, orange-red powder, d 9 07 decomp 500, insoluble in water, soluble in nitric acid Used as a reagent, for ointments for cements, in ceramics, and as a pigment It is probably lead orthoplumbate, $2PbO,PbO_2$ (6) *L peroxide*, PbO_2 = 239 2 Plumbous peroxide, lead dioxide brown lead oxide, lead superoxide A brown, hexagonal crystalline powder d 8 91, decomp on heating insoluble in water, soluble in acetic acid Used as an oxidizing agent in organic synthesis It has both basic and acidic properties, and forms salts (PbX_4) and plumbates (X_2PbO_2) l **oxychloride** (1) $PbCl_2 \cdot PbO$ = 501 3 Plumbous oxychloride White, tetragonal crystals, d 7 21, insoluble in water soluble in alkalis, decomp 541 (2) $PbCl_2 \cdot 2PbO$ = 724 5 A brown solid, d 7 08, m 693 l **palmitate** $(C_{16}H_{31}O_2)_2Pb$ = 717 70 White powder, m 112 3, insoluble in water l **pentasulfide** See *l sulfide* l **pernitrate** Colorless hygroscopic crystals, soluble in water l **peroxide** L oxide (6) l **phenate** Pb(OH)OPh = 317 2 Plumbous phenate, l phenolate, lead carbolate A yellowish or grayish-white powder, insoluble in water, soluble in nitric acid, used in medicinal ointments l **phenolate** L phenate l **phenolsulfonate** $Pb(C_6H_4(OH)SO_3)_2 \cdot 5H_2O$ = 643 52 White lustrous needles, soluble in water or alcohol, used as an astringent or antiseptic l **phosphate** (1) $Pb_3(PO_4)_2$ = 811 7 Plumbous phosphate Lead orthophosphate A white powder, d 6 9, insoluble in water, soluble in nitric acid (2) $Pb(PO_3)_2$ = 365 27 Lead metaphosphate White crystals (3) $Pb_2P_2O_7$ Lead pyrophosphate (q v) (4) $PbHPO_4$ = 303 26 Lead acid phosphate White crystals l **phosphite** $PbHPO_3$ = 287 2 Plumbous phosphite A white powder, decomp on heating, insoluble in water, soluble in nitric acid l **plaster.** A medicinal plaster containing chiefly lead linoleate and glycerol Often used as a standard solution for the determination of the hardness of water by the soap method l **plumbate** *ortho-* L oxide (5) *meta-* L oxide (4) l **poisoning** Plumbism, saturnism A form of anemia, and colic produced as a result of frequent contact with lead l **propionate** $Pb(C_3H_5O_2)_2$ = 353 2 Plumbous propionate A colorless, crystalline powder soluble in water l **protoxide** L oxide (1) l **pyrophosphate** $Pb_2P_2O_7 \cdot H_2O$ = 606 5 Plumbous pyrophosphate A colorless, rhombic, crystalline powder, decomp on heating, insoluble in water, soluble in alkalis or nitric acid l **resinate** $Pb(C_{20}H_{29}O_2)_n$ = 809 2 Plumbous resinate A yellowish paste, insoluble in water or alcohol, used as a paint drier l **rhodanate** L thiocyanate l **saccharate** A compound of saccharose with l oxide, a white powder, insoluble in water, used in medicine l **salicylate** $Pb(C_7H_5O_3)_2 \cdot H_2O$ = 499 3 Plumbous salicylate White crystals, soluble in water or alcohol l **selenate** $PbSeO_4$ = 350 4 Plumbous selenate A white powder, insoluble in water l **selenide** PbSe = 286 18 A brown powder *colloidal-* A suspension used in cancer therapy l **sesquioxide** Pb_2O_3 Lead oxide (5) l **silicate** $PbSiO_3$ = 283 3 Plumbous silicate A white crystalline powder, insoluble in water or alcohol, used in ceramics, in the manufacture of lead glass, in flukes, for porcelain and glass paints, for enamels, and for fireproofing fabrics l **silicofluoride** $PbSiF_6 \cdot H_2O$ = 367 3 Plumbous silicofluoride A colorless crystalline powder, soluble in water l **stearate** $Pb(C_{18}H_{35}O_2)_2$ = 773 8 Plumbous stearate A yellowish, granular, fatty powder, m 115 7, insoluble in water, soluble in alcohol, used as a paint drier and constituent of varnishes l **stibnate** L antimoniate l **subacetate** $2Pb(C_2H_3O_2)_2 \cdot Pb(OH)_2$ = 891 77 Plumbous subacetate, basic acetate of lead, monobasic lead acetate A white powder, soluble in water, used for preparing lead acetate solutions l **subacetate solution** A clear, colorless liquid, containing 189 5 gm per liter, d 1 24, used as a reagent and clarifier Cf *l water, Goulard's extract* l **subcarbonate** L carbonate, basic l **suboxide** L oxide (1) l **sugar** L acetate l **sulfate** $PbSO_4$ = 303 3 Plumbous sulfate A white rhombic crystalline powder, d 6 23, m 1170 insoluble in water, soluble in hot acids or ammonium acetate solution, used as a pigment, paint drier, and in accumulators l **sulfate acidic** $Pb(HSO_4)_2 \cdot H_2O$ = 419 4 A crystalline solid, decomp if heated l **sulfate basic** $PbSO_4 \cdot PbO$ = 526 5 A white powder, insoluble in water, decomp if heated l **sulfide** (1) PbS = 239 3 Plumbous sulfide, galena, galenite A regular crystalline black powder, or silvery-gray crystals, d 7 48, m 1120, insoluble in water, soluble in nitric acid, used in ceramics and as a decolorizer Decomp if heated (2) PbS_5 = 367 57 Lead pentasulfide An unstable yellow powder l **sulfite** $PbSO_3$ = 287 3 Plumbous sulfite A granular white powder insoluble in water, used as an antiseptic and astringent l **sulfocyanide** L thiocyanate l **superoxide** L oxide (6) l **tannate** A compound of tannin and lead A brown powder, slightly soluble in water or alcohol, used as an astringent and antiseptic in dusting powders l **tartrate** $PbC_4H_4O_6$ = 355 3 Plumbous tartrate A white powder, insoluble in water

l **tetrachloride** $PbCl_4$ = 349 0 Plumbic chloride A yellow oily liquid, d_0 3 18, m −15, decomp by water and at 105, used in inorganic synthesis l **tetraethide, l tetraethyl** Tetraethyl *plumbane* l **thiocyanate** $Pb(CNS)_2$ = 323 4 Plumbous sulfocyanide, l rhodanate A yellow monoclinic crystalline powder, d 3 82, slightly soluble in water, soluble in thiocyanate solutions l **thiosulfate** PbS_2O_3 = 319 2 Plumbous thiosulfate, lead hyposulfite A white amorphous powder, decomp with age insoluble in water, soluble in acids and thiosulfate solutions Used in inorganic synthesis, and medicinally, as a dusting powder for rhus poisoning l **tree** The branching crystalline growth of lead which is precipitated from its solution by more positive metals l **tungstate** $PbWO_4$ = 455 2 Plumbous tungstate, l wolframate, raspite, stolzite A yellow powder d 8 23 insoluble in water, soluble in acids, used as a pigment l **vanadate** $Pb(VO_3)_2$ = 405 1 Plumbous vanadate A yellow powder, insoluble in water, used as a pigment l **water** A 1 % solution of lead subacetate l **white** L carbonate, basic l **wire** (1) A wire made from l (2) A chromel-alum or other alloy wire of a thermocouple of a pyrometer l **wolframate** L tungstate l **yellow** L chromate

leadate Trade name for dimethyl dithiocarbamate, a rubber accelerator

leadhillite A native basic sulfate of lead

leaf (1) See *leaves* (2) A thin sheet or foil of metal, as, gold l, palladium l, used for lettering and ornamenting

lean Deficient Cf *fat* l **clay** A clay of poor plasticity l **coal** A low gas content coal l **ore** A low grade ore, *i e*, with a small metal content

leather A tanned skin l **tankage** A fertilizer made from l scraps by digestion with steam, drying and grinding

leatheroid Vulcanized *fiber*

leaves The stem appendages of a plant, containing chlorophyll and possessing respiratory openings The following dried leaves are official (U S P)

Belladonna	Hyoscyamus
Buchu	Matico
Chestnut	Pilocarpus
Chimaphila	Rhus toxicodendron
Coca	Sage
Digitalis	Senna
Eriodictyon	Stramonium
Eucalyptus	Tobacco
Hamamelis	Uva-ursi

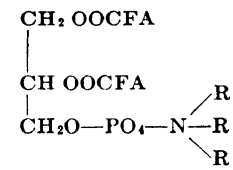
LeBel, Jules Achille 1847–1930 An Alsatian capitalist who, using chemistry as a hobby, discovered the asymmetric carbon atom, (independently of **van't Hoff**) in 1874, in 1891 he prepared the **first optically-active compound of asymmetric nitrogen**

LeBlanc, Nicolas 1742–1806 A French chemist and founder of the alkali industry L **soda process** The manufacture of sodium carbonate by treatment of the salt-cake (Na_2SO_4) obtained from sulfuric acid and salt with carbon and limestone

LeChatelier, Henry Louis 1850–1936 A French chemist noted for the law of chemical equilibrium and work on metallurgical instruments

lecanoric acid $C_{16}H_{14}O_7$ = 318 1 Diorsellinic acid Colorless crystals, decomp on heating with water to orsellinic acid l **monomethyl ether** Evernic acid

lecithin (1) Monoamino-monophosphatide A group of substances of the general composition



in which FA indicates a fatty acid R an alkyl radical They are the esters of oleic, stearic, palmitic or other fatty acids with glycerophosphoric acid and choline Cf *kephalin* (2) $C_{42}H_{84}NPO_9$ = 777 98 A yellowish-brown waxy solid occurring in various animal and vegetable tissues and egg yolk, insoluble in water, soluble in alcohol, ether or chloroform, decomp by heat Used as a tonic and nutrient

lecithoprotein A compound of lecithin and protein in man and animals Cf *conjugate proteins*

Leclanché cell A voltaic cell consisting of an anode of amalgamated zinc, and a cathode of carbon suspended in a solution of ammonium chloride, with manganese dioxide as a depolarizing agent It has an intermittent potential of about 1 46 volts

leditannic acid $C_{76}H_{20}O_{46}$ = 328 2 A tannin from *Ledum* species, Ericaceae

ledixanthin $C_{33}H_{34}O_{13}$ = 602 3 A yellowish-red coloring matter from *Ledum* species

Leduc effect Thermomagnetic difference of temperature, or the effect of a magnetic field on the distribution of heat The effect is considered positive when the upper edge of a metal plate placed transversely between two magnetic poles has the higher temperature, the heat current flowing from left to right

ledum camphor A stearoptene from *Ledum palustre*, wild rosemary, an Ericaceae Cf *Labrador tea*

lees The sediment which accumulates in fermented liquids (*e g*, wine) on standing, mainly albuminoid in character

Leeuwenhoek, Anton van 1632–1723 A lens maker of Delft, Holland, who discovered bacteria by means of a crudely-constructed microscope in 1675

Lefébre, Nicolas 1620–1674 A French apothecary, noted for his textbook of chemistry, 1660

legume The pod of a leguminous plant

legumelin An albumin from peas and beans

legumin A globulin from leguminous plants Cf *avenin*

Leguminosae Pulse family, a group of herbs shrubs or trees whose seeds are used as food (q v), and from which many important commodities and drugs are obtained

roots

Glycyrrhiza glabra	Spanish licorice
Abrus precatorius	Indian licorice
Baptisia tinctoria	wild indigo
Derris elliptica	cube
Derris Lour	deguela
Ononis spinosa	ononin

barks

Erythrophloeum guineense	sassy bark, muavin
Acacia mimosa	mimosa bark
Andira inermis	jamaicin
Robinia pseudacacia	robin

Cercis canadensis	redbud bark
Saraca indica	saraca bark
Piscidia erythrina	Jamaica dogwood
woods	
Caesalpinia sappan	sappan
Haematoxylon campechianum	logwood
Pterocarpus santalinus	red sandalwood
leaves	
Cassia acutifolia	senna
Cassia marilandica	American senna
Theophrosia virginiana	theophrosia
herbs	
Medicago sativa	alfalfa
Melilotus officinalis	sweet clover, melilot
Melilotus coeruleus	melan
Lonchocarpus species	nicoline
Trifolium pratense	red clover, trifolium
Trifolium repens	white clover
Stylosanthes elatior	pencil flower
Galega officinalis	goats rue, galega
Cytisus scoparius	broom, scoparius
fruits	
Cassia fistula	purging cassia
Ceratonia siliqua	St John's bread
Tamarindus indica	tamarind
Dipteryx odorata	tonka bean
seeds	
Abrus precatorius	prayer beads, jequirity
Arachis hypogoea	peanut
Coronilla scorpioides	coronillin
Erythrina species	erythrine
Ormosia dasycarpa	ormosine
Sophora species	sophora
Trigonella foenum graecum	fenugreek
Ulex Europaeus	ulexine
Physostigma venenosum	calabar beans
plant products	
Acacia catechu	catechu
Acacia senegal	gum arabic
Astragalus gummifer	tragacanth
Andira araroba	goa powder
Albizzia anthelmintica	musennin
Pterocarpus marsupium	kino
Copaifera langsdorffii	copaiba balsam
Pongamia glabra	kurung oil
Soja hispida	soybean
Toluifera pereirae	Peru balsam
Toluifera balsamum	tolu balsam

Cf *brazilwood, calliandrein, camwood, indican, lupine, Mackay bean, robinin, syringin*

ehman cardiograph A specially constructed sphygmomanometer, or device for recording heart beats

ehrbachite A mercury ore, HgPbSe

eibnitz, Gottfried Wilhelm Freiherr von 1646–1716 A German mathematician and philosopher Founder of the Berlin Academy of Science (1701)

eipzig yellow Lead chromate

emco A commercial meat extract, used in the preparation of beef-broth media

émery, Nicolas 1645–1715 A French physician and chemist, noted for his chemical textbook and experimental work

emon The ripe fruit of *Citrus limonum*, a Rutaceae, of which fruit, rind and juice are used Cf *lime* **1 balm** Melissa **1 chrome** Barium chromate **1 grass** See *lemongrass* **1 juice** Lime juice **1 oil** Oleum limonis oil of lemon A pale yellow essential oil of fragrant odor, expressed from fresh lemon peels, d 0 849–0 855 $[\alpha]_D$ + 57–65, insoluble in water soluble in alcohol or ether Used extensively in flavoring extracts lemonades etc **1 peel** Cortex limonis The outer rind of fresh ripe fruits of *Citrus medica* lemon, a Rutaceae Used medicinally, as a tincture or fluid-extract, as a tonic, industrially, in flavoring essences for cooking and baking **1 yellow** (1) Lead chromate (2) Barium chromate

lemonbalm Melissa

lemongrass oil Indian melissa oil A colorless or slightly yellow essential oil distilled from *Cymbopogon* or *Andropogon citratus*, a grass of the East Indies, d 0 89, insoluble in water soluble in alcohol or ether Used in flavoring extracts, for cooking and confectionery, and in perfumery It contains citral, geranial and methyl heptenone Cf *citronella oil, melissa oil*

Lenard, Phillipp 1862– A German physicist **L rays** Cathode rays penetrate thin sheets of metal (aluminum or gold), and give rise to long blue streamers, called Lenard rays after their discoverer

length The shortest distance between two points Length is measured in the C G S system by the meter (q v), which was supposed to be the $\frac{1}{10{,}000{,}000}$ part of the distance from the equator to the pole Some magnitudes are

Einstein universe		
2,000 000,000 light yrs		1 9 × 10²⁷ cm
Farthest spiral nebula		
140 000 000 " "		1 3 × 10²⁴ "
Galaxy to galaxy	1,800,000 " "	1 7 × 10²¹ "
Andromeda nebula	900,000 " "	8 5 × 10²⁰ "
Milky Way diameter	50 000 " "	4 7 × 10²⁰ "
Sirius from sun	8 9 " "	8 4 × 10¹⁶ "
1 parsec = 3 08 × 10¹³ km		**3 1 × 10¹⁶** "
1 light year =		
9,462,700,000,000 km		**9 5 × 10¹⁵** "
Solar system diameter		
10,000 000 000 km		1 × 10¹³ "
Neptune from sun	4 400 000 000 km	4 4 × 10¹² "
Earth from sun	149 000,000 km	1 5 × 10¹¹ "
Sun radius	692,000 km	6 9 × 10⁸ "
Moon from earth	384,000 km	3 8 × 10⁸ "
Jupiter radius	72,000 km	7 2 × 10⁷ "
Earth equator	40,070 km	4 × 10⁷ "
Earth radius	6,377 km	6 4 × 10⁶ "
N Y to San Francisco (highway)	5,230 km	5 2 × 10⁶ "
" " " (air-line)	4,451 km	4 4 × 10⁶ "
Moon radius	1,740 km	1 7 × 10⁶ "
1 kilometer = 1000 m =		
1,000,000 mm		**10³** "
Denver above sea-level	1,638 m	1 6 × 10³ "
Steamer Queen Mary, length	310 m	3 1 × 10² "
Lowest sound wave	16 m	1 6 × 10¹ "
Man, average height	172 cm	1 72 "
1 meter = 1000 mm =		
1,000,000μ = 10⁻³ km		**1** "
Longest sound wave	17 mm	1 7 × 10⁻² "
1 millimeter = 1000μ =		
1,000,000 mμ = 10⁻⁶ km		**10⁻³** "
Smallest visible particle	50 μ	5 × 10⁻⁵ "
Cells of Drosophillum	7–25 μ	2 5 × 10⁻⁵ "
Nucleus of Drosophillum	5–15 μ	1 5 × 10⁻⁵ "

Chromosomes of Drosophillum		
	0 2–3 μ	3×10^{-6} "
Coccus bacteria	2 μ	2×10^{-6} "
1 micron (μ) = 1000 mμ = 1,000,000 $\mu\mu$		10^{-6} "
Red blood corpuscle	800 mμ	8×10^{-7} "
Red light wave	770 mμ	$7\ 7 \times 10^{-7}$ "
Smallest microscopic particle	300 mμ	3×10^{-7} "
Average path of hydrogen	170 mμ	$1\ 7 \times 10^{-7}$ "
Large colloidal particle	100 mμ	1×10^{-7} "
Shortest ultra-violet wave	13 mμ	$1\ 3 \times 10^{-8}$ "
Thickness of oilfilm	5 mμ	5×10^{-9} "
Ultramicroscopic particle	4 mμ	4×10^{-9} "
Molecules	0 2 to 5 mμ	5×10^{-9} "
Gas molecule, distance	1 mμ	1×10^{-9} "
1 millimicron (mμ) = 1000 micromicrons ($\mu\mu$) =		10^{-9} "
Sulfur atoms, distance	900 $\mu\mu$	9×10^{-10}
Atoms	100–600 $\mu\mu$	6×10^{-10} "
Silver atoms, distance	400 $\mu\mu$	4×10^{-10} "
Soft x-ray wave	136 $\mu\mu$	$1\ 4 \times 10^{-10}$ "
1 Ångstrom = 100 $\mu\mu$ = 1000 milliångstrom (må) =		10^{-10} "
Electron orbit in hydrogen	53 $\mu\mu$	$5\ 3 \times 10^{-11}$ "
Hard x-ray wave	19 $\mu\mu$	$1\ 9 \times 10^{-11}$ "
1 micromicron ($\mu\mu$) = 10 x-units (λ) or må =		10^{-12} "
Shortest gamma ray	2 $\mu\mu$	2×10^{-12} "
Longest cosmic ray	0 6 $\mu\mu$	6×10^{-13} "
Shortest cosmic ray	0 04 $\mu\mu$	4×10^{-14} "
Electron diameter	0 038 $\mu\mu$	$3\ 8 \times 10^{-15}$ "
Nucleus of gold atom	0 0004 $\mu\mu$	4×10^{-17} "
Nucleus of hydrogen atom	0 00002 $\mu\mu$	2×10^{-18} "

The smallest accurate determination of length is 0 000,03 mm (Fizeau's interference method) The largest accurate measurement of length (for the purpose of determining the velocity of light) is the distance between Mt Wilson and Mt San Antonio, Calif = 35,426 3 meters

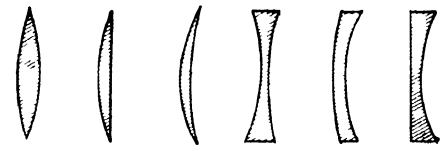
lenigallol Pyrogallol triacetate

lenirobin Chrysarobin tetracetate A yellowish powder, used medicinally for skin diseases

lens A piece of glass or other transparent material, with one or both faces curved, which converges, or diffuses light The principal focus F of a lens is related to the radii of curvature of the surfaces r_1 and r_2 and the index of refraction n by the equation

$$\frac{1}{F} = (n-1)\left(\frac{1}{r_1} + \frac{1}{r}\right) = \frac{1}{f_1} + \frac{1}{f_2}$$

where f_1 and f_2 are conjugate focal distances, or the distances of the object and of the image **achromatic-** A lens which has been corrected for chromatic aberration so as to bring different spectral rays to one focus **aplanatic-** A system of lenses corrected for spherical aberration so as to bring rays into focus in the same plane **apochromatic-** A system of lenses which correct for chromatic and spherical aberration by bringing three spectral rays to one focus **biconcave-** A lens which has a concave surface on both sides) (**biconvex-** A lens which has a convex surface on each side () **bifocal-** A double lens, especially used in eyeglasses, each portion of which has its own different focus **compound-** Two or more lenses combined in effect, one behind the other **concave-** A lens in which the center is thinner than the periphery) ' **convex-** A lens in which the center is thicker than the periphery (| **convex-concave-** A lens with both a concave and a convex surface)) **electron-** See electron optics **plano-concave-** A lens with both a plane and concave surface **plano-convex-** A lens with both a plane and convex surface **quartz-** A lens made of quartz, used in experiments with ultraviolet rays, to which glass is relatively opaque **rocksalt-** A lens made of salt, which permits the passage of many ultraviolet rays to which glass and quartz are opaque



Lenses

1 Biconvex 2 plano-convex, 3 concavo-convex or convergent meniscus 4 biconcave, 5 convexo-concave or divergent meniscus, 6 plano-concave

lenticular Having the shape of a lentil or lens

lentine $C_6H_4(NH_2)_2HCl$ = 181 0 m-diaminobenzene hydrochloride A colorless crystalline powder, which turns pink with age Used in organic synthesis, as a reagent for nitrites in water, and medicinally for diarrhea

leometer Dynamic *meter*

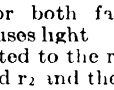
leonite A Stassfurt salt $MgSO_4 \cdot K_2SO_4 \cdot 4H_2O$

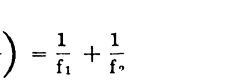
leontin Caulosaponin

leonurus Motherwort

lepargylic acid Azelaic acid

lepathinic acid $C_{20}H_{18}O_{14}$ = 482 2 A crystalline principle from the roots of *Rumex* species, Polygonaceae

lepidene $C_{28}H_{20}O$ = 372 2 Tetraphenylfurfurane,  Colorless crystals, m 175

lepidine $C_{10}H_9N$ = 143 2 γ-methyl-quinoline, cincholepidine,  An alkaloid from cinchona bark A colorless oily liquid, d 1 086, b 266 slightly soluble in water, soluble in alcohol or ether, used in organic synthesis **aminophenyl-** Flavaniline **oxy-** Dibenzoyl*stilbene*

lepidolite $(Li,Na,K)_2Al_2(SiO_3)_3(F,OH)_2$ Lithium mica A slightly colored, lithium-bearing variety of mica (aluminum silicate)

lepidone $C_{10}H_9ON$ = 159 1 Hydroxylepidine, γ-methyl-α-oxyquinoline, γ-methylcarbostyril Colorless crystals, m 223, b_{17mm} 270, slightly soluble in water, alcohol or ether

lepinine 4-Methyl quinine

leprotin $C_{40}H_{54}$ = 534 4 A carotenoid red pigment isolated from chromo mycobacteria, m 198–200 It is a provitamin A

leptandra Culver's root The dried rhizomes and roots of *Veronica* (*Leptandra*) *virginica*, a Scrophylariaceae used as a fluid extract, as a cathartic and tonic

leptandrin A yellow crystalline glucoside from the roots of *Veronica* (*Leptandra*) *virginica*, used as an alterative and purgative

leptandroid An extract containing the combined principles of *Leptandra*, used as a tonic laxative, and alterative stimulant

leptometer A device for comparing the viscosity of two liquids simultaneously and under equal conditions

leptynol Palladous hydroxide suspended in water, used medicinally

lerp A kind of manna found on the Australian shrub, mallee, or *Eucalyptus dumosa*

Lessing ring Contact ring A ¼" metal tube, split and bent, used as packing material in gas absorption towers or fractionating columns

lethal Fatal or deadly **1 dose** The quantity of a substance which causes death **1 gas** Hydrocyanic acid

letterpress Printing by direct impression from inked type

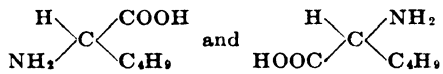
eucacene $C_{54}H_{32}$ = 680 2 A pyrolytic product of acenaphthene containing 12 hexa-atomic and four penta-atomic rings Silky crystals, m 250, insoluble in water

eucaniline $C_{19}H_{19}N_3$ = 289 3 Triaminotriphenylmethane, methenyltrianiline, $CH(C_6H_5NH_2)_3$ According to the position of the amino group there are **p₃**-leucaniline, in which all three amino groups are in para position to the methyl carbon, **o,p₂-**, in which one is in ortho position and two are in the para position, **m,p₂-** or pseudo-, in which one is in the meta, and two are in the para position **para-** Colorless leaflets, m 148, insoluble in water, soluble in alcohol or ether, used in organic synthesis Cf *leucoaniline* **tetramethyl-** See *tetramethyl*

eucaurine $C_{19}H_{16}O_3$ = 292 2 Trihydroxytriphenylmethane triphenylolmethane, p₃-trioxytriphenylmethane, $CH(C_6H_4OH)_3$, derived from aurine **o-methyl-** Leucorosolic acid

eucic acid Leucinic acid

eucine $C_2H_{11}O_2N$ = 131 1 Aminoisocaproic acid, *α*-aminocaproic acid An aminoacid and constituent of many proteins (27 % in zein) Colorless leaflets, d 1 293, decomp 283, slightly soluble in water, alcohol or ether, used in organic synthesis Two optically-active isomers

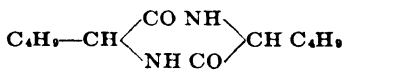


levo- or l- **dextro-** or d-

Cf *leucyl* **iso-** See *isoleucine* **nor-** See *norleucine*

eucinic acid $C_6H_{12}O_3$ = 132 13 *2*-Hydroxy-*4*-methyl-pentanoic acid*, *α*-hydroxyisocaproic acid, $C_5H_{10}(OH)COOH$, soluble in alcohol, ether or water, m 77 (racemic), 82 (active)

eucinimide $C_{12}H_{22}O_2N_2$ = 226 2 The imide of leucyl-leucine or anhydride of *3 6*-di-isobutyl-*2 5*-diacipiperazine A dipeptide formed by reaction of the amino and carboxyl groups of two leucine molecules



Eucippos of Elea A contemporary of Zeno, Empedocles and Anaxagoras (about 450 B C), the founder of the Ancient Greek atomistic theory, later developed by Democritos

eucite $K_2O,Al_2O_3,4SiO_2$ A vitreous, white or gray crystalline mineral in lava Cf *lucite*

euco- A prefix meaning white, and indicating in names of compounds the presence of a triphenylmethane group

euco bases Leuko bases A group of colorless derivatives of triphenylmethane produced by the reduction of dyes, which on oxidation, are reconverted into the dye

leucoaniline $C_{20}H_{21}N_3$ = 303 4 Triaminodiphenyltolylmethane, triaminotriphenylmethane $(NH_2C_6H_4)_2CH\,C_6H_3(NH_2)Me$ Colorless crystals, m 100, insoluble in water, soluble in alcohol or ether, used in organic synthesis Cf *leucaniline* **para-** See *para-*

leucocyte Leukocyte, white blood corpuscle A colorless, ameba-like cell-mass wandering through the tissues **1 extract** An extract of leucocytes obtained from exudates produced in the pleural cavities of rabbits or other animals by the injection of an irritant Cf *aleuronate*

leucocytosis The dissolution of leucocytes

leucodendron Kienabossie, langbeen The plant *L. concinnum*, a Proteaceae of South Africa, used as malaria remedy

leucodrin $C_{15}H_{16}O_8$ = 324 12 Proteacin A crystalline bitter principle, m 212, from leucodendron

leucoglycodrin $C_{27}H_{44}O_{10}$ = 528 32 An amorphous white glucoside from leucodendron

leucoindigo Indigo white

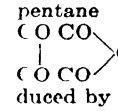
leucoline Quinoline

leucomaines A group of poisonous nitrogen compounds, formed in animal tissues by metabolic activities (Cf *ptomaines*) They are generally compounds of the uric acid type, as adenine, guanine, xanthine, or of the creatinine type

leucomalachite green $C_{23}H_{26}N_2$ = 330 3 Dimethylaminophenyl-phenylmethane $PhCH(C_6H_4NMe_2)_2$ p₂-tetramethyldiaminotriphenylmethane Colorless crystals, m 93, insoluble in water, soluble in alcohol or ether, which give malachite green on oxidation

leucone $SiH(OH)_3$ = 80 09 Orthosilicoformic acid

leuconic acid C_5H_5 = 140 0 Pentaketocyclopentane The pentatomic ring compound



Small colorless needles, produced by strong oxidation of croconic acid

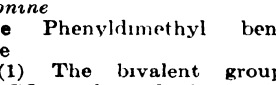
leucopyrites The silvery mineral $FeAs_2$

leucorosolic acid $C_{20}H_{19}O_3$ = 307 2 o-methylleucaurine, p₃-trioxy-o-methyl-triphenylmethane Colorless crystals derived from rosolic acid, used in organic synthesis

leucoscope (1) An optical pyrometer for determination of the temperature of an object The light is separated by polarization into two complementary parts (2) A photometer for the study of colored rays of light

leucosin An albumin from wheat, rye and barley embryos

leucothionine $C_{12}H_{11}N_3S$ = 229 1 Diamidothiodiphenylamine



Cf *thionine*

leucotrope Phenyldimethyl benzylammonium chloride

leucyl (1) The bivalent group —NH CH-(C_4H_9) CO— derived from the aminoacid leucine (2) The monovalent group NH_2-$C_5H_{10}CO$— **1 leucine** The dipedtide NH_2-CH(C_4H_9) CO—NH CH(C_4H_9) COOH

leuko- Leuco-

leukomaines Leucomaines

leukonic acid Leuconic acid

eukonin A commercial name for sodium antimoniate, used in enamels

eukotine $C_{21}H_{20}O_6$ = 368 2 A crystalline substance found in paracoto bark

eunaphos A fertilizer consisting of diammonium phosphate and ammonium sulfate (20 % N, 15 % P_2O_5)

eunaphoska A fertilizer consisting of diammonium phosphate, ammonium sulfate and potassium chloride (13 % N, 10 % P_2O_5, 13 % K_2O)

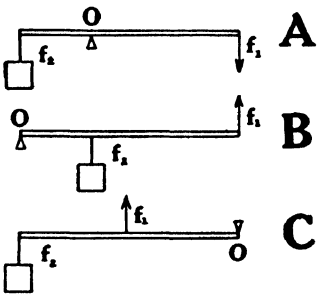
euna saltpeter A fertilizer from Leuna, Germany, consisting of 165 pts ammonium sulfate and 100 pts ammonium nitrate

evan A soluble polysaccharide found in the leaves of certain grasses and made up of repeating units of fructo-furanose

evant wormseed Santonica

eveler A liquid which is added to a lacquer solvent to adjust volatility and/or viscosity

evelling bulb A glass vessel connected by rubber tubing to a burette, and used in gas analysis to level a liquid to the same height in both, so that the pressure in both containers is the same



Levers

O = *fulcrum*, f_1 = *power*, f_2 = *load* A = *first order*, B = *second order*, C = *third order*

ever A mechanical device for increasing the speed or force of an agent source of power (see figure)

everierite $Al_2O_3\ 2SiO_2\ nH_2O$ A pearly, light brown clay, resembling kaolin

evigation The reduction of a substance to a powder by grinding in water, followed by fractional sedimentation in order to separate the coarser from the finer particles

evo-, lævo- A prefix indicating that a substance rotates the plane of polarized light to the left (counter-clockwise), abbreviation *l- e g*, *l*-leucine

evogyric Levorotatory

evol's alloy An alloy of 71 9 % silver and 28 1 % copper

evorotatory Rotating the plane of polarized light from right to left (counter-clockwise) Cf *polariscope, optical activity*

evulic acid Levulinic acid

evulin Synanthrose

levulinamide $C_5H_9O_2N$ = 115 1 $MeCOCH_2CH_2CONH_2$ Colorless crystals, m 107

levulinic acid $C_5H_8O_3$ = 116 1 Levulic acid *β*-acetopropionic acid, *γ*-ketopentanoic acid, oxopentanoic acid* The keto acid, $MeCOCH_2CH_2COOH$ Colorless leaflets, d 1 137, m 33, b 245, soluble in water, alcohol or ether **dimethyl-** Mesitonic acid **methyl-** Homolevulinic acid **phenylhydrazine-** Antithermin

l aldehyde $C_5H_8O_2$ = 100 1 b-Acetopropionaldehyde A colorless liquid, d 1 016, decomp 187, soluble in water, alcohol, or ether

l hydrazide $C_5H_{11}O_2N_2$ = 131 2 $MeCO\text{-}CH_2CH_2CO\ NHNH_2$ Colorless crystals, m 82

l oxime $C_5H_9O_2N$ = 115 1 $MeC\ NH\text{-}CH_2CH_2COOH$ Colorless crystals, m 95

levulosans See *fructosans*

levulose Fructose

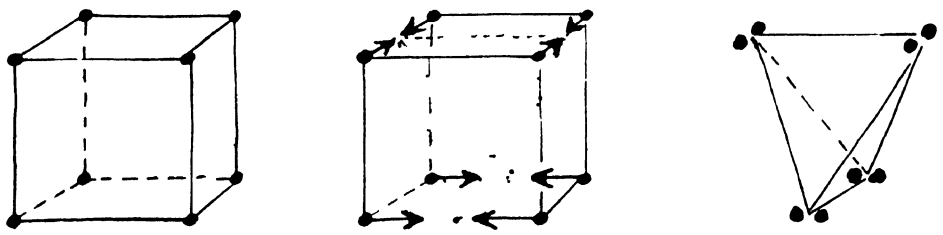
Lewis, Gilbert Newton 1875– An American chemist, noted for thermodynamic theories and their application to chemistry, and theories of atomic structure, valence, and photons **L -Adams formula** An expression which relates the fundamental constants, *h*, *c*, and *e* (Cf *constants, Bohr's formula for Rydberg's constant*)

$$\frac{hc}{2\pi e^2} = 8\pi \left(\frac{8\pi^5}{15}\right)^{\frac{1}{4}}$$

The numerical values are 137 29 and 137 348 **L 's atom** The static concept of the atom, based upon the facts of crystallography and chemical combinations, as opposed to the dynamic Bohr atom, based upon ionized gases and spectroscopy The electrons are thought to oscillate or vibrate around definite centers located at the corners of a cube (**cubical atom**) or in pairs at the corners of a tetrahedron (**tetrahedral atom**) See figure, and cf *kernel, octet, valence* **L color theory** Color is produced by the absorption of certain rays by those electrons of a molecule which vibrate with the same frequency **L -Langmuir theory** The atom is built up of successive shells which hold 2, 8, 18, 32, 18 and 8 electrons as their maximum capacities **L symbols** A method of illustrating bonds by indicating electrons with dots One electron of each atom will pair with another electron of another atom to form a bond, thus

2H and O give H O H See also *octet formula, bond, polar compounds* **L theory** A chemical bond is *polar* when an electron passes from one atom to another, *non-polar* when two atoms share a pair of electrons equally

lewisite $C_2H_2AsCl_3$ = 207 28 *1*-Dichloroarsino-*2*-chloroethylene, *β*-chlorovinyl dichloroarsine, Cl CH CH AsCl An extremely irritant,



Lewis atom

liquid, d.1.89, m.−5, b.190 (decomp.); used as vesicant poison gas.

ley. The mixture of salt and glycerol formed during the saponification of crude fats by sodium hydroxide in soap manufacture. It contains 6–8 % glycerol, 10–20 % salts, less than 0.4 % Na_2O (as carbonate), organic impurities and 0.2–0.3 % fatty acids. Cf. *lye.*

Leyden jar. See *jar.*

li. An abbreviation for link.

Li. The symbol for lithium.

liatris. Deers' tongue. The dried leaves of *Liatris odoratissima*, a Compositae, used for flavoring tobacco and in flavoring extracts.

Libavius, Andreas. 1540–1616. A German alchemical writer and pioneer in blowpipe analysis.

liberation. The act of setting free, as the formation of a gas from a compound.

lichen. Algae and fungi which live symbiotically, that is: two primitive plants, one with, the other without chlorophyll, which live together; *e.g.*, Iceland moss. They yield coloring matter (litmus, orchil, zearin), numerous acids (*e.g.*, orsellic acid), carbohydrates and depsides. **l. sugar.** Erythrite. **l. starch.** Lichenin. **l. stearic acid.** $C_{14}H_{14}O_3$ = 230.1. A crystalline dibasic acid derived from Iceland moss, m.120, insoluble in water.

lichenin. $(C_6H_{10}O_5)_n = (162.11)_n$. [$n$ = 80–160]. Lichen starch, moss starch. A β-gluco-pyranose carbohydrate derived from Iceland moss, *Cetraria islandicus*, which is digested by invertebrates only. A white gelatinous substance or a white powder, soluble in hot water, m.10.

lichenol. $C_9H_9O_4.C_2H_5$ = 210.1. The ethyl ester of evernesic acid from the oil of oak moss, *Evernia prunastri.* Cf. *sparassol.*

licorice. Glycyrrhiza. **Indian-Abrus. Spanish-**Glycyrrhiza.

Lichtenberg figures. The pattern formed by an electric spark when passing through a thin layer of insulator; as, sulfur. They are recorded on a photographic film and the pattern indicates the nature of the current. Cf. *klydonograph.*

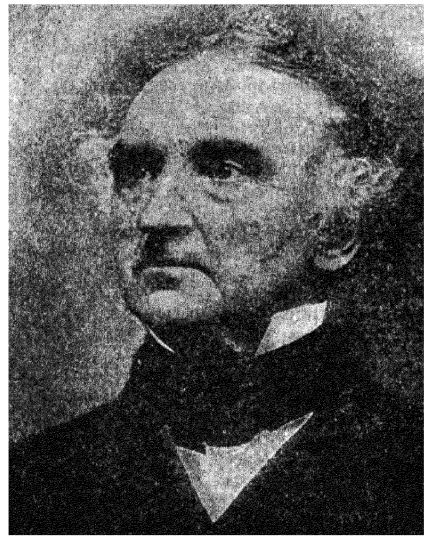
Lieben solution. A solution of iodine in potassium iodide.

Liebermann, Carl. 1842–1914. A German chemist noted for the synthesis of alizarin (with Gräbe). **L. reaction.** Nitroso reaction for phenols. A small fragment of sodium nitrite is dissolved in 5 cc. conc. H_2SO_4 and added to a crystal of phenol; a brown solution results, which changes to blue. The mixture poured into water gives a red solution, which changes to blue on the addition of alkali, owing to the formation of p-nitroso-phenol.

Liebig, Justus Freiherr von. 1803–1873. A German chemist, noted as the founder of agricultural chemistry and a popular teacher. **L. condenser.** A glass tube, surrounded by a wider tube in which water circulates; used as condenser in distillation apparatus. **L. extract.** A meat extract, manufactured in Argentine, used as a nutrient and in bacteriological work for making bouillon. **L. potash bulb.** A triangularly-bent glass tube with two or more bulbs filled with potassium hydroxide, used in organic analysis.

lien siccus. The dried and powderized spleen of cattle; used medicinally.

Liesegang rings. A periodic precipitation formed in gelatin by the gradual diffusion towards one another of two types of ions, which are previously added to different portions of the gelatin and which normally precipitate one another. Under these conditions the precipitate appears banded in distinct rings.



Justus von Liebig.

(From Moore's "History of Chemistry. McGraw-Hill Book Company, New York, N. Y.)

life. (1) The vital force, or the principle underlying the phenomena of organized beings. It depends on the *protoplasm*, which exercises the function of *metabolism, growth, reproduction, adaptation*, and *evolution*, q.v. (2) An inappropriate synonym for "time" or "time-period"; as: **damping l.** See *damping period.* **half l.** See *half-life* and *radioactivity.* **lingering l.** See *lingering period.* (3) Colloquially, but inappropriately, the period of usefulness of a device, machine, or other inanimate thing.

l. elements. The bioelements (q.v.) necessary for an organism. Their functions are classified as follows:

Group I.	Hydrogen and oxygen; *energy exchange elements.*
Group II.	Carbon, nitrogen, sulfur, and phosphorus; *anion (or acid) group formers, with varying valence; energy storers.*
Group III.	Sodium, potassium, calcium and magnesium; *cation (or base) formers, with fixed valence; translocation regulators.*
Group IV.	Manganese, iron (cobalt and nickel), copper and zinc; *cation (or base) formers, with varying valence; oxidation-reduction regulators.*
Group V.	Boron, aluminium, silicon, arsenic, selenium; *ampholytes, with varying valence; functions unknown.*
Group VI.	Chlorine, fluorine (bromine and iodine); *anion (or acid) formers, with fixed valence; functions unknown.*

Group VII	Cobalt and nickel, *cation (or base) formers, with varying valence, functions unknown, but perhaps those of Group II*
Group VIII	Germanium, gallium and other rare elements, *ampholytes, functions unknown*

Cf *abundance, protoplasm, periodic system, food, fertilizer*

l everlasting The dried herb of *Gnaphalium obtusifolium* (*Antennaria dioica*), a Compositae, used as a fluid extract as a diuretic and astringent **l root** Senecio

gasoid A dispersed colloidal system, consisting of a liquid phase suspended in a gaseous phase, as, a fog or mist

ght (1) A form of radiant energy Cf *radiation, spectrum* In particular, those electromagnetic waves which affect the sight sense and form the visible spectrum red orange, yellow, green, blue, violet, or those radiations which, on being stopped by an object, render it visible by virtue of their transformation into visible rays The average velocity of light in air is 299,711 km per second The average velocity of light in a vacuum is $2\ 99776 \times 10^{10}$ cm per second = 984×10^{6} ft per sec = 299,776 km per second = 186,285 miles per sec In different media it changes proportionally to the wavelength as follows

	For violet λ 4200	*For red* λ 6500
in air	1 000297	1 000292
in water	1 3420	1 3320
in diamond	2 4570	2 4108

These figures represent the ratio velocity in vacuo/velocity in medium Its *intensity*, is measured in phots, its *quantity*, in lumens, its *quality* as colors Thus

Physical phenomenon	Objective stimulus	Subjective response
radiation	light	color
intensity	brightness	brilliance
wavelength-distribution	dominant λ and purity	hue and saturation

Cf *photometry, spectroscopy* (2) Not heavy, as, l metals **absorbed-** Those radiations which are transformed by matter **actinic-** Radiations which are rich in ultraviolet rays, as, the l of a mercury vapor lamp Cf *irradiation* **artificial-** A gas-filled lamp operated at a color temperature of 2848°K which was adopted as the *normal* artificial l by an International Commission in 1931 **axial-** The rays passing through the optic axis of a system **diffracted-** L which has undergone diffraction, q v **diffused-** L which has been scattered or reflected **Finsen-** Sunlight which has passed through a copper sulfate solution, which absorbs the yellow, red and infrared rays **monochromatic-** L consisting of one wavelength only, as the l of a sodium flame, however, this apparently pure yellow light is made up of several wavelengths An absolutely monochromatic l can be obtained only by screening a spectrum **polarized-** L whose vibrations are all in the same plane, or whose vibrations are parallel to each other and change uniformly, as, circularly- or elliptically-polarized l q v Polarized light can be obtained by reflection or by passage through certain minerals, as Iceland spar (Nicol prism, q v) **reflected-** L which is turned back from a smooth surface, as a glass plate, mirror, or polished metal surface **refracted-** L which passes at an angle through a transparent medium, gas, liquid or solid and thereby changes its direction, as in prisms and lenses **scattered-** See *scattering, Raman effect, Tyndall effect* **transmitted-** L which has passed through a medium, and has not been absorbed **ultraviolet-** See *radiations* and *rays*

l filter Color screen **l metal** A metallic element with a density below four In particular the elements located in the upper right hand portion of the periodic table, alkali metals, earth-alkali metals and earth metals They are characterized by a single valence (1, 2, or 3), a simple spectrum, strong electromotive force (positive), and they form colorless compounds Their valence electrons rotate at a distance from the nucleus Cf *periodic system* Antonym Heavy metals, nonmetals **l oils** A fractional distillate from coal tar, b 110–210 used as a source of benzene toluene and xylenes **l scattering** See *scattering* **l titration** See *titration* **l year** A unit of astronomical distance The distance which light travels in one year at the rate of 299,800 km per sec It equals $9\ 5 \times 10^{1}$ km or $5\ 9 \times 10^{11}$ miles

lightning The electric flash associated with thunderstorms, or artificially produced **l jar** An electric condenser or Leyden jar

lignasan Ethyl mercuric chloride A wood preservative

lignin (1) A generic term for the cellulose-like substance which lines woody fibres, and includes lignose, lignone and lignin It is supposed to consist of four condensed molecules of coniferol (2) $C_{10}H_{10}O_6$ = 356 2 A cyclic unsaturated compound from wood

lignite A brown coal in which the original structure of the wood is still recognizable It contains 25 45 % carbon See *jet hartite, geocerinic acid montan wax*

lignoceric acid $C_{24}H_{48}O_2$ = 368 50 Tetracosanoic acid* $C_{23}H_{47}COOH$ An acid derived from wood, m 81 soluble in alcohol or ether **Δ^{14}-** Nervonic acid **α-hydroxy-** $C_{22}H_{43}CHOH\,COOH$ An acid from phrenosin **α-hydroxy-Δ^{14}-** α-Hydroxy-nervonic acid An unsaturated acid $Me(CH_2)_7CH\,CH(CH_2)_{12}CHOH\,COOH$ from nervone

lignone A substance derived from wood containing 50 1 % C, 5 82 % H and 44 08 % O

l sulfonate The waste liquor from sulfite process of paper making

lignose A substance derived from wood containing 46 1 % C 6 09 % H and 47 81 % O

lignosulfin Lignosulfite

lignosulfite Lignosulfin A liquid obtained as by-product in the manufacture of sulphite cellulose, used for inhalations in pulmonary tuberculosis, and as a tanning agent

lignum The Latin term for wood **l benedictum** The wood of guaiac **l cedrum** Cedar wood **l nephriticum** The wood from *Pterocarpus indicus*, a tree of the Philippines, or *Eysenhardtia polystachia*, a Mexican tree These woods give highly fluorescent infusions **l rhodium** The wood of *Amyris balsamifera*,

a tree of tropical America 1 **sanctum,** 1 **vitae** Guaiac

ligroin Ligroine The fourth fraction petroleum distillation-product d 0 707–0 722, b 90–120, used as a solvent

ligustrin Syringin

ligustron A crystalline principle from the bark of *Ligustrum vulgare* Colorless crystals, m 105

Ligustrum A genus of oleaceous shrubs, the privets

lilac The dried leaves and fruits of *Syringa vulgaris,* used as a bitter tonic

lilacin Syringin

Liliaceae Lily family, a group of herbs with flowering stems springing from bulbs or corms, with parallel nerved leaves The following species yield drugs

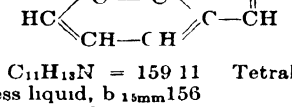
Smilax china	china root
Smilax officinalis	sarsaparilla
Convallaria majalis	lily of the valley
Veratrum viride	American hellebore
Schoenocaulon sabadilla	sabadilla
Polygonatum biflorum	Solomon's seal
Trillium erectum	trillium
Asparagus officinalis	asparagus
Allium sativum	garlic
Helonias dioica	helonias
Urginea maritima	scilla or squill
Colchicum autumnale	meadow saffron, colchicum seeds
Aloe vera, ferox etc	aloes
Xanthorrhoea species	acaroid gum

See also *comosic acid, imperialine, superbine, zygadenine*

Liliiflorae An order of phanerogamous plants consisting of the families Juncaceae, Liliaceae, Amaryllidacea Iridaceae Dioscoraceae and Bromeliaceae

liliquoid A dispersed or colloidal system consisting of two liquid phases, as emulsions

lilole $C_{11}H_9N$ = 155 1 The heterocyclic hydrocarbon



lilolidine $C_{11}H_{13}N$ = 159 11 Tetrahydrolilole A colorless liquid, b $_{15mm}$156

lily of the valley Convallaria

limanol A preparation of salt-marsh mud used for rheumatism

lime (1) Calcium oxide, calx, quicklime, burnt lime (2) The fruit of *Citrus acida,* a Rutaceae, used for its juice and as antiscorbutic (3) The linden or l tree, *Tilia Europaea,* a Tiliaceae Its flowers are used as tonic Cf *linden* **burnt-** Calcium oxide **chloride of-, chlorinated-** Bleaching powder **fat-** Burnt- **quick-** Calcium oxide **hydrated-** Calcium hydroxide **slaked-** A dry white powder, chiefly calcium hydroxide, obtained by treating quicklime with sufficient water to satisfy its chemical affinity under the condition of its hydration **unslaked-** Calcium oxide **sulfurated-** Calcium sulfide

l **juice** Succus Citri The expressed sap from lemons, the ripe fruits of *Citrus medica C limonum* or *C acida,* a Rutaceae It contains 5–10 gm citric acid, and is used as antiscorbutic, antiseptic and refrigerant l **nitrate** A commercial grade of calcium nitrate, used as fertilizer l **oil** (1) An essential oil expressed from the rinds of the fruit of *Citrus limetta,* a Rutaceae, containing citral and limonene Used in flavoring extracts and perfumery (2) An essential oil distilled from citron, b 175–215, containing d-limonene l **water** Liquor calcis A saturated solution of calcium hydroxide in water, it contains about 0 15 gm of $Ca(OH)_2$, and is used as a reagent and as an antiacid

limelight An illumination produced by heating lime to brilliant white heat with an oxyhydrogen flame

limene $C_{12}H_{24}$ = 204 2 A sesquiterpene from lime oil

limestone A pulverized rock consisting mainly of calcium carbonate, used in fertilizers, concrete mixtures, and in metallurgy **magnesian-** q v.

liminal (1) Barely perceptible by the senses (2) The lowest or minimal quantity l **value** That fraction of a normal solution (in moles per liter) of a narcotic or other drug which produces a definite physiological effect, it is therefore inversely proportional to the narcotic power of a drug *E g ,* the liminal value for monacetin is 0 5, for sulfonal 0 006 Cf *schwellenwert, Meyer's theory*

liming material Material used as a medium for the application of lime or limestone in agriculture, *e g ,* burnt or lump lime mixed with marl

limit A border or boundary l **of elasticity** The smallest stress which produces a permanent alteration

limiting curve A line on a graph which represents a boundary between two phases

limnology The study of fresh waters

limonene $C_{10}H_{16}$ = 136 2 $\Delta^{1\,8(9)}$-*p*-menthadiene, q v A terpene of lemon-like odor A colorless liquid, d 0 853 b 176, insoluble in water, soluble in alcohol or ether Three isomers **d-** or dextrolimonene, citrene, carvene, hesperidene, found in the essential oils from citrons and dill **l-** or levolimonene, occurring in the oil of fir cones **dl-** or i- inactive limonene (terpene)

limonite Bog ore A hydrated ferric oxide (60–70 % Fe_2O_3), with some carbonate used as iron ore from Rotorua, New Zealand, used as a cure for bushsickness

Linaceae Flax family A group of herbaceous (sometimes woody) plants that yield some important drugs and fibres

Linum usitatissimum	linen, flaxseed, linseed oil
Erythroxylon coca	coca leaves

linaloe oil An essential oil distilled from a Mexican wood A colorless fragrant, liquid d 0 88, insoluble in water, soluble in alcohol, ether, chloroform or benzene, used in the manufacture of linalool and in perfumery

linalool $C_{10}H_{18}O$ = 154 2 Coriandrol, 2,6-dimethyloctadiene-2,7-ol-6, $Me_2C\ CH(CH_2)_2$-$CMeOHCH\ CH_2$ A terpene of bergamot-like odor in coriander and linaloe oil A colorless liquid, *d-* d 0 875, b 198, *l-* d 0 866, b 195, slightly soluble in water, soluble in alcohol or ether, and used in perfumery

linalyl The monovalent radical $C_{10}H_{17}$—, 2 6-dimethylocta-2 7-dienyl, derived from linalool l **acetate** $C_{12}H_{20}O_2$ = 196 2 Linalool acetic ester $Me_2C\ CH(CH_2)_2CMe(OCOMe)CH$ -

CH_2 A colorless liquid d 0 91, b 220, slightly soluble in water, soluble in alcohol or ether Used in perfumery

linamarin $C_9H_{13}NO_7$ = 247 14 An acetone cyanhydrin glucoside, m 141, from flax and *Phaseolus lunatus*

linarin A glucoside from toad-flax, *Linaria vulgaris*, a Scrophulariaceae

linarite A basic copper and lead sulfate $PbSO_4,Cu(OH)_2$

linden A tree of genus *Tilia*, a Tiliaceae **American-** Basswood, American lime, *T americana*, which yields 1 oil **European-** *T europaea*, yielding tilia and lime (3) **l flowers** See *lime* (3) **l oil** Basswood oil An oil expressed from linden flowers and seeds, which resembles cotton seed oil

lindgrenite $2CuMoO_4Cu(OH)_2$ A Chilean mineral, transparent, green, biaxial holohedra

lindol Trade name for tricresyl phosphate

line (1) The dimension of extension which possesses length but neither breadth nor thickness (2) The $\frac{1}{12}$ part of an inch (3) A narrow streak or strip, as, the image produced by the slit of a spectroscope, q v **absorption-** A line corresponding with light which has been absorbed on its passage through a gaseous liquid or solid medium **bright-** The emission lines characteristic of an element **C-** The dark Fraunhofer line of λ6562 8 which corresponds with the hydrogen line H_α **calcium-** The characteristic lines of calcium, especially the Fraunhofer lines G, H, and K **D_1-, D_2-** The yellow light of the sodium flame, λ5895 9, λ5890 0, respectively **dark-** Absorption or Fraunhofer lines **emission-** The bright l characteristic of an element **Fraunhofer-** A dark l in the solar spectrum caused by the absorption of light in passing through incandescent vapor Cf *solar spectrum* **hydrogen-** See *H line* **hyperfine-** L close together, due to nuclear moments **K-** See *K line* **metallic-** L due to metallic elements **nebular-** L characteristic of nebulae Cf *nebulium* **solar-** See *solar spectrum*

l of force The direction in which a force acts, as **electric-** The curves radiating from a positive towards a negative charge **magnetic-** The curves or lines made visible by small iron filings in the field of force of a magnet **l spectrum** A spectrum which shows lines instead of bands They are the images of the slit before the prism and the source of light contains rays of as many different wavelengths as there are lines Single wavelengths, (lines) are caused by excited atoms and ions, while bands are due to molecules

linear Pertaining to one dimension length **l expansion** The length-wise expansion of materials under the influence of heat Cf *cubical expansion* **l measures** The units of measuring length (q v) or distance

linen A textile manufactured from flax, the fibers of the flax stem Cf *lint*

lingering period The time, usually very short, during which an electron travels in the highest energy level of an excited atom It is followed by the *damping* period (during which the characteristic radiation is emitted), and return to the normal state

linhay A concrete platform, on which china clay is stored prior to shipment

liniment An oily liquid preparation used medicinally for external application

linin (1) Oxychromatin A morphological or structural element of the cell, commonly termed the linin network (2) The active principle of purging flax, *Linum catharticum*, a Linaceae of Europe Colorless lustrous, bitter crystals, used as a purgative

lining (1) The inside portion of a furnace (2) A thin coating **acid-** L made of silica bricks **basic-** L made of magnesite bricks **neutral-** L made of coal or chrome bricks

link li An obsolete linear measure used in surveying 1 li = 0 66 feet = 20 11684 cm = $\frac{1}{25}$ rod

linkage The lines used in structural formula to represent valency connections between the atoms, thus each line represents a valency of one, a double line a valency of two, etc In more recent conceptions a linkage or nonpolar bond (q v) is produced by a pair of electrons, one from each atom, by which two atoms are held together See *bond, polar*

linnaeite $(Co,Ni)_3S_4$ Linnaetite Cobalt-nickel pyrite A native cobalt-nickel sulfide

linnaetite Linnaeite

linoleate A compound of a metal and linoleic acid of the type $C_{17}H_{31}COOM$, where M is a monovalent metal If M is replaced by an alcohol radical, the resulting compound is a fat

linoleic acid $C_{17}H_{31}COOH$ = 280 2 Linolic acid, *9 12*-octadecadienoic acid*, octadecadien-*9 12*-oic acid, $Me(CH_2)_4CH\ CH\ CH_2\ CH\ CH\text{-}(CH_2)_7COOH$ A fatty acid occurring as glyceride in all drying oils A yellow oily liquid, d 0 921, m −18, b 230, insoluble in water, soluble in alcohol, ether chloroform or benzene **l acid series** A group of unsaturated aliphatic acids of the general formula

$C_nH_{2n-4}O_2$

sorbic acid	$C_6H_8O_2$
geranic acid	$C_{10}H_{16}O_2$
palmitolic acid	$C_{16}H_{28}O_2$
linoleic acid	$C_{18}H_{32}O_2$
humoceric acid	$C_{19}H_{34}O_2$
eicosinic acid	$C_{20}H_{36}O_2$

linolenic acid $C_{17}H_{29}COOH$ = 278 2 Octadecatrien-*9 12 15*-oic acid, *9 12 15*-octadecatrienoic acid* A colorless liquid, d 0 922, insoluble in water, soluble in alcohol or ether

linoleum A canvas coated with a mixture of linseed oil, powdered cork and pigment Cf *oil cloth*

linolic acid Linoleic acid

linotype metal An alloy of lead (83 5 %), antimony (13 5 %) and tin (3 %) used for making printing type

linoxyn Solid, oxidized linseed oil, used in the manufacture of linoleum

linseed The dried seeds of flax, *Linum usitatissimum*, a Linaceae, sometimes used medicinally as a demulcent and emollient **l cake, l meal** The solid residue of l after removal of the oil, used as a cattle feed **l oil** Flax seed oil, oleum lini A yellow oil expressed from linseed, the seeds of *Linum usitatissimum* a Linaceae Oily yellow liquid, d 0 932, m −27, saponification value 188–195, iodine value 170–192, refractive index 1 473 at 40°C , insoluble in water, soluble in alcohol ether, chloroform, benzene or turpentine Used in paints, varnishes, lacquers, rubber substitutes, linoleum and leather industry *boiled-* A linseed oil which has

been thickened by boiling, and dries more rapidly on exposure to air, used in varnishes and driers

lint Charpie byssus A soft and flexible linen used for dressing wounds **cotton-** An inferior short-fibred product made from cotton

linter The short cotton fibers left after ginning, they are used as a source of pure cellulose

linum The Latin term for linseed (flax)

lionite An impure native tellurium

lion's tooth Taraxacum

lipase A ferment occurring in the liver, pancreas and other digestive organs, which splits neutral fats into glycerin and fatty acids also applied to any ferment which splits fats into fatty acids and alcohol **gastric-** A lipase of the stomach **pancreatic-** Steapsase **vegetable-** A lipase occurring in many plants

lipide A proposed name for lipins **complex-** A l which contains phosphorus and/or nitrogen Cf *lipoid* **tertiary-** A l which contains neither phosphorus nor nitrogen

lipins A generic term for fats and lipoids, or the alcohol-ether soluble constituents of protoplasm, which are insoluble in water Classification, (Matthews)

1 a FATS—neutral esters of glycerol and fatty acids b FATTY ACIDS
2 FATTY OILS—neutral esters of glycerol and fatty acids, liquid at 20°C
  a drying oils—harden on exposure to air
  b semi-drying oils—thicken slowly on exposure to light and air
  c non-drying oils—remain liquid on exposure to light and air
3 ESSENTIAL OILS—Volatile, generally odoriferous substances, *e g*, terpenes, aldehydes and alcohols
4 WAXES—Esters of sterols and fatty acids
5 STEROLS—High-atomic alcohols, solid at 20°C
6 PHOSPHO-LIPINS—Phosphatides Fatty compounds which contain phosphoric acid, as lecithins
7 GLYCO-LIPINS—Fatty substances which contain carbohydrates, as cerebron, phrenosin
8 SULFO-LIPINS—Fatty substances, contain sulfuric acid, as protagon, brain-sulfatide
9 AMINO-LIPINS—Fatty substances, contain amino-acids as bregenin
10 CHROMO-LIPINS—Lipochromes Fatty substances, contain a pigment or coloring matter

lipochrome One of a group of fatty pigments or coloring matters occurring in natural fats, such as egg-yolk and butter See *carotenoids*

lipoclastic Lipolytic

lipoid, lipoidic Having the character of a lipid

lipoids A group of nitrogenous fats consisting of lecithins, cholesterol and phosphatides

lipoiodine $C_{21}H_{39}I_2COOEt$ = 618 1 Ethyl-diiodobrassidate ethylester of diiodobrassidic acid White odorless, tasteless, needles m 37, insoluble in water, slightly soluble in alcohol, soluble in ether, phenol or oils, used medicinally as a substitute for iodides

lipolysis The decomposition or dissolving of a fat, the reverse reaction of saponification

lipolytic Lipoclastic An agent that decomposes a fat into its alcohol (glycerin) and fatty acid

lipoprotein A group of complex proteins consisting of a simple protein combined with a higher fatty acid

Lipowitz' alloy A low melting-point alloy of 50 % Bi, 27 % Pb, 13 % Sn and 10 % Cd, m 71 7 Used in automatic fire sprinklers and for toy spoons

lippia Yerba dulce The dried leaves and inflorescence of *Lippia dulcis*, a Verbenaceae, used as the fluid extract, as a demulcent or expectorant **l citriodora** Lemon scented verbena The dried leaves of *Aloysia citriodora*, a Verbenaceae used as sedative and in sachets

lippianol A monohydric alcohol from the essential oil of *Lippia species* (Verbenaceae)

Lippmann, Edmond O von 1857 A German organic chemist, noted for work on the sugar industry and chemical history **L electrode** Capillary electrode An early form of the mercury dropping electrode (q v), used as a standard electrode **L electrometer** Capillary electrometer

liquation The extraction of metals from ores by heating on an inclined hearth and collecting the molten metal

liquefaction The change to the liquid form, especially the condensation of gases to a liquid

liquefon A unit of the starch-liquefying power of enzymes

$$\text{Log}_{10} L = (S - 1078)\ 0\ 000565,$$

where L = liquefons per 10 cc infusion, S = mg starch liquefied in one hour

liquescent Tending to become fluid or liquid

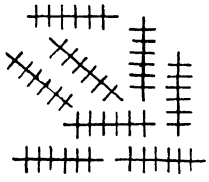
liqueur A strongly flavored and sweetened alcoholic beverage

liquid A fluid or substance that flows readily A state of matter intermediate between a solid and a gas shapeless and fluid, taking the shape of the container and seeking the lowest level It differs from a gas in its inability to diffuse throughout the whole volume of a containing vessel Cf *solvent*, *parachor* **associated-** Polar- A l in which the molecules form groups (probably coordinate bonds q v) and in which K of the Ramsay-Shields or Morgan equation increases linearly with temperature until at t it has maximum value **Newtonian-** True liquids, which do not alter in viscosity on stirring Cf *thixotropy* **non-associated-** Normal- **normal-** Nonpolar- A l consisting of independent molecules that is, with no coordinate bonds or unshared electrons in the octet and in which K = 2 12 ergs per degree **polar-** Associated **semipolar-** A l intermediate between associated and normal, as alcohol glycerol See figure

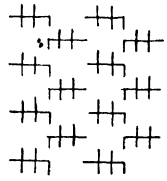
l acetylene Acetylene gas compressed into steel cylinders containing some infusorial earth and acetone used in welding **l air** Liquefied air, or a mixture of liquid oxygen and nitrogen A clear colorless liquid intensely cold and giving off oxygen and nitrogen vapors which freeze the moisture of the surrounding air kept in open Dewar vessels Used for the production of low temperatures, medicinally in the treatment and relief of poison oak and poison ivy eruptions **l ammonia** Ammonia gas liquefied under pressure and shipped in steel cylinders For uses, see *ammonia* **l carbon dioxide** Carbon dioxide gas compressed into steel cylinders Used as a refrigerant for producing pressure in carbonated and soft drinks for blowing up tires of automobiles, etc see

carbon dioxide **l chlorine** Chlorine gas compressed into steel cylinders and used extensively in bleaching industry see *chlorine* **l ethylene** Ethylene gas compressed in steel cylinders and used as an anesthetic and in welding See *ethylene* **l helium** Helium gas compressed into steel cylinders, and used for

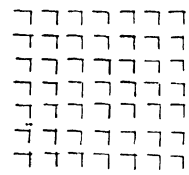
TYPES OF LIQUIDS



Hexane
Nonpolar or
normal L
benzene
carbon tetrachloride
hydrocarbon oils



Alcohol
Semipolar or
intermediate L
alcohol
glycerol
methylal
ether
acetone
chloroform



Water
Polar or
associated L
glycol
liq ammonia
water

filling dirigibles **l hydrogen** Hydrogen gas compressed in steel cylinders and used in welding production of high temperatures, filling balloons and dirigibles, hydrogenation of oils and cracking of petroleum see *hydrogen* **l hydrogen sulfide** Hydrogen sulfide gas compressed in steel cylinders, used in chemical industry, and as a reagent **l nitrous oxide** Nitrous oxide gas compressed in steel cylinders and used as a dentist's anesthetic, as a substitute for oxygen in jewelers' blowpipes, as a preservative for perishable foods, fruits, tissues, and biological liquids **l oxygen** Oxygen gas compressed into steel cylinders and used in welding anesthesia mine-rescue work and as a detonating and blasting material, see *oxygen* **l smoke** The first distillate in the fractional distillation of wood, which contains acetic acid, tar, and phenol compounds (pyroligneous acid), used in the preservation or "smoking" of meat **l sulfur dioxide** Sulfur dioxide gas compressed into glass bottles, used in the laboratory as a reducing agent and in synthesis See *sulfur dioxide*

liquidambar Copal balsam copalm The balsamic exudates of *Liquidambar styraciflua*, a Hamamelidaceae of North America, used medicinally for coughs Cf *storax*

liquidus A curve relating to a liquid phase of a 2-component solution (see *solidus*)

liquor An aqueous solution **l ammoniae** Ammonium hydroxide **l calcis** Lime water **l of flints** A solution of silica in potash (potassium silicate) **l trinitrin** A 1 % solution of glyceryl trinitrate in alcohol

liquorice Glycyrrhiza

liroconite A native, hydrated copper aluminum arsenate

lisoloid A dispersed or colloidal system consisting of a liquid phase surrounded by a solid phase, as, a jelly or a liquid crystal

Lissajou's figure The pattern produced by a spot of light reflected from two mirrors, mounted on the ends of two tuning forks that are vibrating at right angles

Lister, Joseph, [*Baron*] 1827–1912 An English surgeon who founded antiseptic surgery

listerine A proprietary antiseptic solution containing boric acid, benzoic acid, thymol, and essential oils of *Eucalyptus*, *Gaultheria* etc

liter, litre The metric unit of volume or capacity One liter is the volume occupied by 1 kg of pure water at 4°C and 760 mm pressure It was originally intended to be 1000 cc 1l = 1000 ml = 1000 028 cc = 1 05671 quarts = 0 264178 gallon = 33 8174 fluid ounces = 270 518 fluid drams 1 mol of any gas occupies 22 4 liters at 0°C and 760 mm **micro-** μl or λ, lambda One millionth part of a liter, $1\lambda = 10^{-6}$ l **milli-** ml One thousandth part of a liter, 1 ml = 10^{-3} l = approximately 1 cc **Mohr-** An obsolete unit of volume The volume of 1 kg of water at 15°C weighed in vacuo It occupies 1000 91 cc

litharge Lead oxide, yellow

lithate Urate

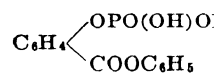
lithia Lithium oxide **l mica** Lepidolite **l water** A solution of lithium bicarbonate

lithic acid Uric acid

lithi The Latin genitive of lithium, used in the U S P to designate salts of lithium, as, lithi benzoas = lithium benzoate

lithium Li = 6 94 An element, atomic number 3, the first member of the alkali metals in group 1 of the periodic system It has a valency of one A silver-gray metal, d 0 524, m 186, b 1400, reacting with water and must be stored in kerosene or petrolatum L is widely distributed, but only in very small quantities, its principal minerals are amblygonite (8–9 % Li) lepidolite (1–6 % Li) petalite, and spodumene (5–7 % Li), it occurs also in several mineral waters It was discovered in 1817 by Arfvedson, and named from the Greek lithos (= stone) It forms only one series of compounds which are all soluble in water and dissociate into the Li^+ ion Used as "scavenger" in purifying metals traces of Li added to Al increase hardness, with Pb it produces a bearing metal Also used as deoxidizer in copper alloys **l acetate** $Li(C_2H_3O_2)\,2H_2O = 102\,0$ Rhombic white crystals, m 70 soluble in water used as a diuretic and antirheumatic **l acetyl salicylate** $C_2H_3O\,OC_6H_4COOLi = 186\,06$ Hydropyrine apyron, tyllithin, litmopyrine grifa Used for medicinal purposes **l agaricinate** A white powder of slight saline taste, soluble in water and used as an anhidrotic **l amide** $(LiNH_2)_n = (22\,96)_n$ Colorless cubic crystals d 1 178, m 390, b 430, decomp in water, used in organic synthesis and as catalyst **l arsenate** $Li_3AsO_4\,\frac{1}{2}H_2O = 168\,8$ A white powder soluble in water, used as an anti-arthritic in gout, malaria and anemia **l benzoate** $LiC_7H_5O_2 = 128\,0$ A light white powder of cooling taste, soluble in water, used as a diuretic, urinary antiseptic and sedative **l benzosalicylate** A white crystalline powder, soluble in water and used as an urinary antiseptic **l bicarbonate** $LiHCO_3 = 68\,0$ A white powder, slightly soluble in water (lithia water) **l bichromate** $Li_2Cr_2O_7 = 229\,9$ An orange-red crystalline powder, soluble in water **l bitartrate** $LiC_4H_5O_6\,H_2O = 174\,1$ Tartarlithine Colorless

crystals, soluble in water, used medicinally for gout 1 **borate** $Li_2B_4O_7\ 5H_2O$ = 259 2 A white powder, slightly soluble in water, used as an antiseptic and in dental cements *meta*- $LiBO_2$ = 49 76 A white powder, soluble in water 1 **borocitrate** $Li_2HC_6H_5O_7\ 2HBO_3$ - $2H_2O$ = 359 4 A white powder, soluble in water, used as an urinary antiseptic 1 **bromide** LiBr = 86 9 A hygroscopic, colorless powder d 3 464, m 442, soluble in water, or alcohol, used as a nerve sedative 1 **cacodylate** $LiMe_2AsO_2\ H_2O$ = 162 1 A light, white powder, soluble in water, used medicinally for anemia 1 **caffeine sulfonate** Symphorol 1 **carbide** Li_2C_2 = 37 89 A white powder $d_{18°}$ 1 65 1 **carbonate** Li_2CO_3 = 73 9 Colorless prisms, d 2 11, m 700, slightly soluble in water, insoluble in alcohol, used as an antiacid and in artificial mineral waters *acid*- L bicarbonate 1 **chlorate** $2LiClO_3\ H_2O$ = 198 82 A deliquescent solid, m 50 *per*- L perchlorate 1 **chloride** LiCl = 42 4 Colorless octahedric crystals containing $2H_2O$, d 2 068, m 606, soluble in water, alcohol or ether, used medicinally as an antirheumatic, and commercially in pyrotechnics for the production of red fires 1 **chromate** $Li_2CrO_4\ 2H_2O$ = 166 1 A yellow, hygroscopic crystalline powder, soluble in water, alcohol or ether 1 **citrate** $Li_3C_6H_5O_7$ $4H_2O$ = 281 9 A white, odorless, slightly hygroscopic, powder It is frequently used medicinally in the treatment of gout 1 **dichromate** L bichromate 1 **dithiosalicylate** $(LiC_7H_4O_3S)_2$ = 350 1 A gray powder, soluble in alcohol or water, and used as an antirheumatic 1 **fluophosphate** LiF Li_3PO_4 - H_2O = 169 8 Colorless crystals, soluble in water, used as a flux in ceramics 1 **fluosilicate** $Li_2SiF_6\ 2H_2O$ = 191 97 L silicofluoride White monoclinic crystals, d 2 33, soluble in water 1 **fluoride** LiF = 26 0 A white crystalline powder, slightly soluble in water, used in ceramics for enamels 1 **formate** HCOOLi = 52 1 Colorless crystals, soluble in water, used medicinally for gout 1 **germanate** Li_2GeO_3 = 134 48 Colorless powder, d 3 53, m 1239, slightly soluble in water 1 **glycerophosphate** $Li_2C_3H_7O_6P$ = 184 1 A white crystalline powder soluble in water, used medicinally in gout 1 **hippurate** $LiC_9H_8O_3N$ = 185 1 A white powder, slowly soluble in hot water, used medicinally for uric acid diathesis 1 **hydride** LiH = 7 95 A white solid, m 680, d 0 82, decomp in water to H_2 and LiOH 1 **hydroxide** LiOH = 24 0 White crystals, soluble in water, slightly soluble in alcohol, used as a reagent and in the manufacture of lithium salts 1 **iodate** $LiIO_3$ = 182 0 A white powder, soluble in water 1 **iodide** LiI = 133 86 White hygroscopic crystals containing $3H_2O$, d 4 063, m 720 soluble in water or alcohol Used medicinally as a diuretic and alterative, commercially, in the manufacture of artificial mineral waters 1 **lactate** $LiC_3H_5O_3$ = 96 0 A colorless crystalline powder, soluble in water, used as a diuretic 1 **laurate** $C_{12}H_{23}O_2Li$ = 206 12 A white solid, m 229 5 1 **mercuric iodide** Mercuric lithium iodide 1 **metaborate** $LiBO_2$ = 49 8 A white powder, slightly soluble in water 1 **myristate** $C_{14}H_{27}O_2Li$ = 234 15 White solid, m 223 9 1 **nitrate.** $LiNO_3$ = 69 0 Colorless rhombohedric crystals, d 2 39, m 253, soluble in water, used in pyrotechnics for red fires, and in the manufacture of artificial mineral waters 1 **nitride.** Li_3N = 34 83 Used as catalyst in ammonia synthesis 1 **nitrite** $LiNO_2\ H_2O$ = 70 96 Colorless needles, d 1 615, soluble in water 1 **oxalate** $Li_2C_2O_4$ = 102 0 Colorless crystals, soluble in water 1 **oxide** Li_2O = 29 9 Lithia A colorless and caustic powder, d 2 102, subliming at 600, soluble in water, slightly soluble in alcohol, used in the manufacture of lithium salts 1 **palmitate** $C_{16}H_{31}O_2Li$ = 262 18 A white solid, m 224 5 1 **perchlorate** $LiClO_4$, $3H_2O$ = 160 45 A deliquescent soluble solid 1 **phenate** LiC_6H_5O = 100 0 L carbolate, 1 phenylate, phenollithium A colorless powder which turns pink with age, soluble in water or alcohol, used as an antiseptic 1 **phenolsulfonate** $LiC_6H_5SO_4\ H_2O$ = 198 1 L sulfocarbolate A white crystalline powder, soluble in water, used medicinally in the treatment of uric acid diathesis 1 **phosphate** $Li_3PO_4\ H_2O$ = 133 9 Colorless rhomboidal crystals, d 2 41, m 857, slightly soluble in water, used in medicine 1 **platinichloride** Li_2PtCl_6, $6H_2O$ = 529 9 Yellow crystals, used in analysis 1 **quinate** Urosine 1 **rhodanate** L thiocyanate 1 **salicylate** $LiC_7H_5O_3$ = 144 0 A white, hygroscopic, odorless powder, soluble in water or alcohol, used as an antirheumatic and intestinal antiseptic 1 **salol orthophosphite** Salvosal lithia, the lithium salt of salol-o-phosphorous acid



Colorless crystals, decomp in hot water, soluble in cold water, used medicinally for influenza and gout 1 **silicate** Li_2SiO_3 = 89 94 White rhombic crystals, d 2 52, m 1201, insoluble in water **basic-** Li_4SiO_4 = 119 82 White crystals, d 2 28, m 1256, insoluble in water 1 **silicide** Li_6Si_2 = 97 76 Blue crystals, d 1 16, decomp by heat or water 1 **silicofluoride** L fluosilicate 1 **sozoiodolate** $C_6H_2(OH)I(SO_3Li)$ = 304 97 Colorless or slightly yellow, shining leaflets, slightly soluble in water, used as an antirheumatic 1 **stearate** $C_{18}H_{35}O_2Li$ = 290 21 A white solid, m 221 0 1 **succinate** $Li_2C_4H_4O_4\ 3H_2O$ = 184 1 Colorless crystals, soluble in water or alcohol, used as an antiseptic 1 **sulfate** Li_2SO_4 = 110 0 Colorless monoclinic crystals containing $1H_2O$, d 2 21, m 843, soluble in water or alcohol Used medicinally as a diuretic and antirheumatic, technically in pyrotechnics for red fires, and in the manufacture of artificial mineral waters 1 **sulfide** Li_2S = 46 0 A colorless powder, d 1 66, soluble in water 1 **sulfite** Li_2SO_3, H_2O = 111 96 Needle-shaped soluble crystals 1 **sulfocarbolate** L phenolsulfonate 1 **sulfocyanide** L thiocyanate 1 **sulfoichthyolate** A tarry liquid, used as an ichthyol substitute 1 **tartrate** $Li_2C_4H_4O_6\ H_2O$ = 180 1 A white crystalline powder, soluble in water or alcohol, used as an antirheumatic 1 **thallium tartrate** $C_4H_4O_6LiTl\ 2H_2O$ = 396 39 Triclinic crystals, d 3 144 1 **thiocyanate** LiCNS = 65 0 L rhodanate Colorless, hygroscopic crystals, soluble in water, used as a reagent 1 **urate** $C_5H_3O_3N_4Li$ = 174 04 A soluble salt of lithium used for gout 1 **valerate** $LiC_5H_9O_2$ = 108 1 White crystals of valerian-like odor, soluble in water, used medicinally as an antirheumatic and sedative 1 **vanadate**

$LiVO_3 H_2O$ = 123 9 A yellowish crystalline powder, soluble in water

tho- A prefix derived from the Greek indicating "stone", as in lithography (stone-writing)

thocholic acid $C_{24}H_{40}O_5$ = 376 32 An acid from bile Cf *choline, sterols*

thofellic acid $C_{20}H_{36}O_4$ = 340 28 Microscopic crystals, m 206, insoluble in water

thography A method of printing in which the design is drawn transversely inverted on a stone with a greasy ink, and treated in succession with water and a printing ink which is accepted only by the greasy design, the stone is then used for printing on paper In modern lithography the design is produced photographically on a zinc plate from which it is transferred on a rotary machine to a rubber blanket, which is brought into contact with the paper (offset process)

thology Petrology

thomarge The mineral, $K_2O,Al_2O_3,6SiO_2, xH_2O$

thopone Lithophone, Griffith white, Orr white, Charlton white A stoichiometric mixture of zinc sulfide and barium sulfate, used as a white pigment in paints, in the rubber industry, for oil cloth manufacture and as a filler **cadmium** A red or yellow pigment analogous to 1, in which the zinc sulfide is replaced by cadmium sulfide

thosphere The solid earth crust as compared with the liquid (hydrosphere) and gaseous (atmosphere) layers of the earth surface For composition, see *abundance*

thuric acid $C_{15}H_{19}NO_9$ = 357 15 White crystals, m 204 5, from bladder stones

tmin azo- See *azolitmin* **erythro-** See *erythrolitmin*

tmopyrine Lithium acetyl salicylate

tmus Lacmus, turnsole, lacca coerulea A purple coloring matter obtained from various lichens, *Roccella* and *Dendrographa* species A blue, amorphous powder, which is usually marketed mixed with calcium carbonate and compressed into small cubes, it contains azolitmin and lecanoric acid Used as an indicator in volumetric anaysis, for the preparation of litmus paper and litmus tincture **1 milk** Milk colored with litmus and used in bacteriology as a culture medium, to detect the production of acidity **1 paper** (*neutral-* or *purple-*) A filter paper impregnated with a solution of litmus of pH 7 0 (*blue-*) A filter paper impregnated with a litmus solution of pH 8 0 (colored blue by a few drops of alkali) (*red-*) A filter paper impregnated with litmus solution of pH 6 0 (colored red by a few drops of acid) **1 pencil** A wax pencil colored red and blue with litmus, used in analytical chemistry to make streaks on glass ware or paper, thus to detect acidity alkalinity **1 tincture** A saturated solution of litmus in alcohol and/or water, used in analytical chemistry as an indicator and in bacteriology for culture media

tre Liter

ttle, Arthur Dehon 1863–1935 An American chemist noted for developments in chemical engineering

ttorol See *pelagic*

ttrow prism A glass prism with 90°, 60° and 30° angles, which reflects light internally from one surface, used in spectrographs Cf *Cornu prism*

ver (1) A gland of mammals which forms glycogen from the maltose of venous blood, and which secretes bile It also stores glycogen takes part in the formation and destruction of blood corpuscles, and converts nitrogeneous materials into urea (2) A natural sulfide mineral **1 extract** A concentration of the antianemic principle of mammalian l , used to stimulate erythrocyte-formation in the bone marrow **1 of sulfur** The result of fusing together potassium carbonate and sulfur It contains chiefly potassium sulfide and polysulfides, used for skin diseases **1 ore** Cinnabar **1 sugar** Glycogen

liverwort The dried herb of *Hepatica triloba*, a Ranunculaceae, used as a mild mucilaginous astringent **English-** Lichen caninus, ground liverwort The lichen, *Peltigera canina*, used as a mild purgative

livetin A protein from egg-yolk

livingstonelte $2Sb_2O_3 HgO$ Antimonite (q v) containing mercury

lixiviation The extraction and separation of a soluble substance from a mixture with insoluble matter, *e g* , leaching of salts from ashes

lixivium The filtrate obtained by leaching a soluble from an insoluble matter, as the lye obtained from wood ashes

ln Abbreviation for natural logarithm

loadstone, lodestone Magnetite

loading A heavy substance, usually of mineral nature, (clay, gypsum, starch etc) added to textiles, papers, rubber etc to give weight or smoothness Cf *filler*

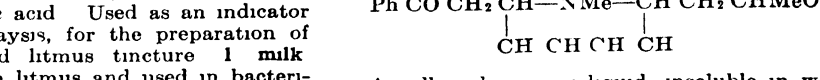
loalin Trade name for a polystyrene plastic

loam Clay mixed with sand

lobate Describing a growth of bacteria, in which the borders of the cultures show lobes or deep undulations or fissures

lobelia Indian tobacco The dried leaves and flowering tops of *Lobelia inflata*, a Lobeliaceae Used as a fluid extract, as an antispasmodic and expectorant

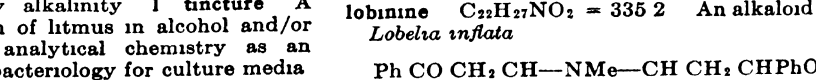
lobeline $C_{18}H_{23}O N$ = 285 3 Inflatine An alkaloid from the seeds of lobelia



A yellowish syrupy liquid, insoluble in water, soluble in alcohol or chloroform, used as an antispasmodic and sedative **1 hydrochloride** $C_{18}H_{23}O_2N HCl$ = 321 8 Yellowish crystals, soluble in water, used as an antispasmodic **1 sulfate** $(C_{18}H_{23}O_2N)_2 H_2SO_4$ = 668 6 Yellowish, hygroscopic crystals, soluble in water Used as a powerful relaxant and antispasmodic, and in the treatment of the tobacco habit

lobeloid The combined principles of Indian tobacco, used medicinally as an expectorant and relaxant

lobinine $C_{22}H_{27}NO_2$ = 335 2 An alkaloid from *Lobelia inflata*



lobinol The principal dermatitant of poison oak, *Rhus diversiloba*

local Restricted to one place or spot, as, local anesthesia (anesthesia of one particular region of the body)

locamphen A liquid obtained by the interaction of 10 pts iodine, 20 pts phenol, and 70 pts camphor A dark reddish-brown viscid liquid

insoluble in water, soluble in alcohol; used as an antiseptic.

Locke's solution. An artificial, protein-free blood-serum consisting of 9.0 gm. NaCl, 0.2 gm. $CaCl_2$, 0.4 gm. KCl, 0.2 gm. $NaHCO_3$, 0.25 gm. glucose in 1000 cc. water. Cf. *Ringer's solution.*

Lockyer, Sir Joseph Norman. 1836–1920. An English astronomer who discovered (with Frankland) helium in the sun's chromosphere.

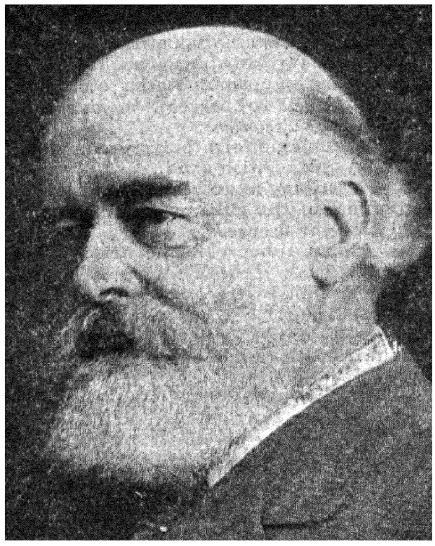
locust bean. Carob bean. **l. tree.** The tree *Robinia pseudacacia* of semi-desert North America, which yields robin.

lodal. A derivative of papaverine: 6.7-dimethoxy-2-methyl-3.4-dihydroisoquinoline chloride; it is a proprietary drug.

lode. A vein of metallic deposit filling the fissure of a rock. **mother-** The great gold vein of Central California.

lodestone. Magnetite.

Lodge, Sir Oliver Joseph. 1851–1940. An English physicist, noted for his work in electrical science. **L.-Cottrell process.** A process for the electrostatic precipitation of smokes and fog, widely used in industry. Cf. *Cottrell.*



Sir Oliver Joseph Lodge.

(From Thomson's "Outline of Science." Courtesy of G. P. Putnam's Sons, N. Y.)

Loeb, Jacques. 1859–1924. An American physiologist, noted for his work on colloids, artificial parthenogenesis and the effects of ions on protoplasm. **L. collection.** A collection of chemical types (elements and compounds) deposited by research workers in the United States National Museum for record purposes.

Loeffler. See *Löffler.*

Loew theory. A theory explaining the physiological action of poisons on a chemical basis: All substances capable of acting on aldehyde- or amino-groups are poisonous to the living tissue, even in very dilute solutions, as they exert a substituting action and thereby change the dynamic equilibrium of the protoplasm.

Löffler, Friedrich A. J. 1852–1915. A German bacteriologist, noted for his methods of staining bacteria. **L. methylene blue.** A bacteriological dye-solution prepared by dissolving 0.5 gm. methylene blue, in 40 cc. alcohol, 2 cc. N/10 KOH, and 98 cc. water. **L. mixture.** A culture medium for the growth of bacteria: 250 cc. glucose bouillon and 750 cc. horse-serum or beef-blood serum.

log. Abbreviation for **logarithm.** $\log_{10}$. Common logarithm. $\log_e$ or ln. Natural logarithm.

Loganiaceae. Logania family. A group of herbs, shrubs or trees, many of them poisonous, which yield many important alkaloids and drugs; as:

seeds:	
Strychnos nux vomica.....	nux vomica strychnine brucine
Strychnos ignatii.....	St. Ignatius bean
bark:	
Strychnos malaccensis.....	hoang-nan
rhizomes:	
Gelsemium sempervirens....	gelsemine
Spigelia marilandica.....	pink root
extractive:	
Strychnos castelnaeana.....	curare.

loganin. $C_{25}H_{34}O_{14}$ = 558.26. A glucoside from nux vomica, m.215.

logarithm. The logarithm (log) of a number, n, is the power, x, to which the logarithmic base, a, must be raised to give that number. $n = a^x$, and $x = \log_a n$. **common-** L. whose base is 10. Abbreviated log or $\log_{10}$. **Napierian-** Natural. **natural-** Napierian-. L. whose base is e (q.v.) or 2.71828 . . . Abbreviated, $\log_e$ or ln.

l. conversion: ln ( ) = **2.3026** log ( ), where ln is the natural, and log the common logarithm.

logarithmic. Pertaining to logarithms. **l. sector method.** Quantitative spectroscopy based on the difference in length between two tapering wedges, produced by photographing the two spectra concerned after passage of the incident light through a wedge-shaped aperture in a disc which rotates in front of the spectrograph.

logwood. Haematoxylon. **l. crystals.** Hematoxylin. **l. extract.** A dark reddish-blue paste made by extracting logwood. Used in dyeing textiles and leather and for the manufacture of haematoxylin. **l. paste.** Hematoxylin paste. Cf. *brazilwood, fustic, sappan.*

-logy. A suffix derived from the Greek λογος (word), indicating a science or doctrine; as, histology, pathology.

loiponic acid. $C_{17}H_{11}NO_4$ = 173.1. Piperidine-3.4-dicarboxylic acid. An oxidation-product of meroquine and quinine.

lokav. Chinese blue.

loliin. A volatile constituent of the seeds of *Lolium* species.

lolium. Poisonous darnel. A grass, *L. temulentum,* found abundantly in wheat and oat fields during wet seasons.

Lomonósov, Michájlo Vasílievič. 1711–1765. A Russian scientist noted for theories of molecular structure, conservation of energy and matter, and of light waves.

London clay. A tough, compact, lower Eocene clay formation, red-brown at the surface and blue-gray below. **L. paste.** A mixture of quicklime and caustic soda moistened with alcohol. **L. purple.** An insecticide: 43 parts arsenic trioxide, 12 parts aniline, 21 parts lime and 1 part ferrous oxide.

longitude. See *co-ordinates.*

ngitudinal Lengthwise or parallel to the longer axis of a body Antonym latitudinal

oseness The extent to which a dyestuff may be removed by friction

phine $C_{21}H_{16}N_2$ = 296 27 *2 4 5*-Triphenylimidazole Colorless needles, m 275, insoluble in water

phophorine $C_{13}H_{17}O_3N$ = 235 2 Methoxyanhalonine An alkaloid from mescal buttons, the buds of *Anhalonium lewinii*, a cactus of Mexico It is physiologically active, similar to anhalonine and mescaline, and produces hallucinations

pion G2949 A gold-thiourea preparation used for treatment of tuberculosis

randite A native sulfo-arsenide of thallium, $TlAsS_2$

renit $C_9H_6O_4NSI$ = 351 04 An isomer of loretin, used medicinally in dressing wounds and as a substitute for iodoform

orentz, Hendrik Antoon 1853–1928 A Dutch physicist noted as a pioneer of the electron theory **L -Lorenz equation** The molecular refractivity, R, is related to the molecular weight, M, density, d, and refractive index, n, by

$$R = \frac{n^2 - 1}{n + 1} \frac{M}{d}$$

Cf *collinsics*

retin $C_9H_4IN\,OH\,SO_3H$ = 351 05 *7*-Iodo-*8*-hydroxyquinoline-5-sulfonic acid, yatren Bright yellow, odorless crystals, slightly soluble in water, insoluble in ether, readily soluble in Na_2CO_3 solution It forms salts with metals, used medicinally as a wound dressing substitute for iodoform and a specific amebicide in dysentery

retinates The metal salts of loretin, *e g*, bismuth loretinate (loretin bismuth) and calcium loretinate (loretin calcium), used as antiseptics in wound dressings

oring, Frederick Henry 1870– An English chemist **L numbers** See *probability*

riodendrin A bitter principle from the bark of the tulip-tree, *Liriodendron tulipifera*, a Magnoliaceae White brittle crystalline scales m 82 decomp 125, insoluble in water soluble in alcohol or ether Cf *tulipiferine*

rol Trade name for a mixture of aliphatic alcohols formed by the high pressure hydrogenation of coconut oil

oschmidt number The number, n of gas molecules per cc at 0°C and 760 mm pressure n = 2 705 × 10^{19} molecules Cf *Avogadro number*

sophan $C_7H_5I_3O$ = 485 6 Triiodo-m-cresol $C_6HI_3(OH)Me$ Colorless crystals, insoluble in water soluble in ether, chloroform oils, or fats, used as an external antiseptic

tase An enzyme of *Lotus arabicus*, converting lotusin into hydrocyanic acid and lotoflavin

th An obsolete German metallurgical unit of weight 1 loth per centner = 1 part per 3200

tion A liquid preparation used for washing and rinsing, usually an antiseptic solution **black-** A solution of calomel in lime water used as a parasiticide and antiseptic **yellow-** A solution of corrosive sublimate in lime water

toflavin $C_{15}H_{10}O_6$ = 286 08 A yellow coloring matter from *Lotus arabicus* Cf *lotusin*

tusin $C_{28}H_{31}NO_{16}$ = 637 3 A glucoside from the leaves of *Lotus arabicus*, a Leguminosae Yellow crystals hydrolysed to dextrose, hydrocyanic acid and lotoflavin

loudness The intensity of sound as measured by the human ear and expressed in bels (q v) Common conversation is about 60 decibel L differs from the sound energy as measured by electrical instruments (cf *phon*)

Loudness (*human ear*)	=	Sound Energy (*electric instrument*)
10 decibels	=	10
20 decibels	=	100
30 decibels	=	1,000
40 decibels	=	10,000
50 decibels	=	100,000
60 decibels	=	1,000,000
70 decibels	=	10,000,000
80 decibels	=	100,000,000
90 decibels	=	1,000,000,000
100 decibels	=	10,000,000,000

loup A simple magnifying lens

louver A ventilator of sloping boards or slats, usually fixed, which keep out rain, but not air

lovage Sea parsley, levisticum, ligusticum, Chinese tang-kui, man-mu The dried herb of *Levisticum officinale*, an Umbelliferae, used as the fluid extract, as an aromatic and carminative Cf *eumenol* **Scotch-** The root of *Ligusticum scoticum*, used sometimes by Highlanders as chewing tobacco **l oil** A colorless essential oil of fragrant odor distilled from lovage, insoluble in water, soluble in alcohol or ether and used in perfumery It contains terpineol and terpene

Lovibond tintometer A colorimeter for comparing the color of a liquid with a standard series of tinted glass slides

low Weaker or poorer **l carbon** A steel with small carbon content **l explosives** A class of unstable chemicals and mixtures consisting of carbon, sulfur and nitrates, such as black gunpowder, blasting powder Antonym high explosives

loweite $2MgSO_4{,}2Na_2SO_4{,}5H_2O$ A vitreous yellow, or white, fusible mineral

Lowenstjern See *Kunkel*

lox An explosive consisting of liquid oxygen, used in mining With fuses it explodes like gunpowder, with detonators it detonates like dynamite

loxa bark Cinchona bark

lozenge A medicated tablet, usually for throat diseases

Lu The symbol for lutecium

luargol $(C_{12}H_{12}O_2N_2As)_2\,AsBr\,SbO(H_2SO_4)_2$ *3 3'*-Diamino-*4 4'*-hydroxy arsenobenzene silver bromide antimonyl sulfate A remedy for sleeping sickness

lubanol Coniferol

luboil Lubricating oil

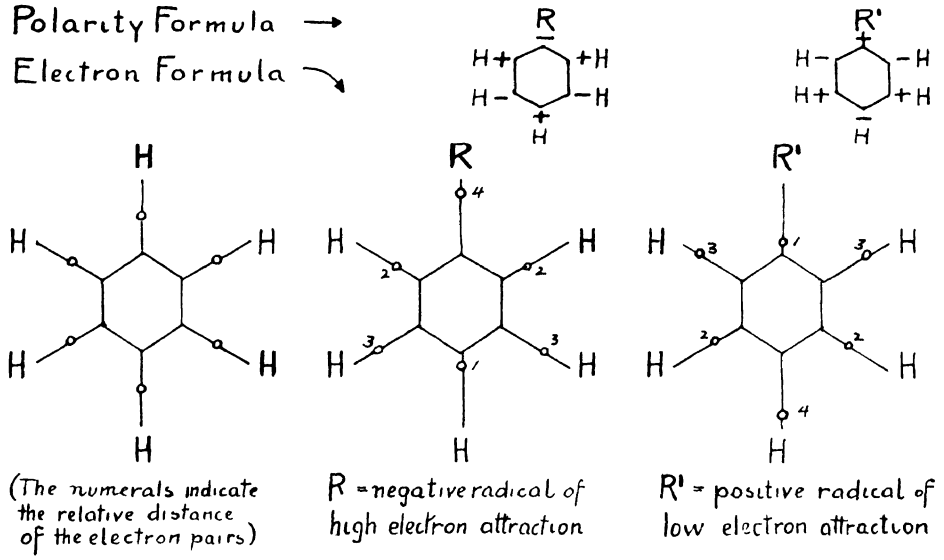
lubricant An agent that decreases friction between moving surfaces **liquid-** An oil or semiliquid grease **solid-** A lubricant such as graphite, talc, soap, or sulfur

lubricating oil A heavy distillate of petroleum of varying density, used for lubricating machinery

lubrication Making smooth or slippery

lubricator Lubricant

Lucas, Howard J 1885– An American chemist, noted for work in organic chemistry **L theory** In an organic compound the substituting radical affects the electronic orbits of a carbon atom either (a) by pulling the electronic pair towards the substituting radical if it has a high electron attraction (i e , is nega-



Lucas theory

tive), or (b) by repelling it from the substituting radical, if the latter has a low electron attraction (*i e*, is positive) In each case the remaining electronic orbits are either shortened or elongated This explains, in conjunction with the Pauling structure of benzene, the difference in the degrees of reactivity of the para ortho, and meta positions which are respectively, most, less and least influenced by the substituting radical (See figure) Cf *screening effect*

icerne Alfalfa

iciferase An enzyme found in a luminous mollusk, *Pholas dactylas*, which is luminescent in cold but not hot aqueous solutions

iciferin A water-soluble protein from a luminous mollusk *Pholas dactylus*, or the fire-fly, *Cypridina hilgendorfi*

iciferinase An enzyme associated with the production of luciferin

icigenin Methyl acridilium nitrate

icinite A native aluminum phosphate $Al_2O_3 \cdot P_2O_5 \cdot 4H_2O$

icite A methyl acrylate polymeride used to substitute glass and in insulators Cf *leucite*

icium A supposed chemical element discovered in 1896, which proved to be a mixture of rare earth metals

ucretius About 98–55 B C The earliest scientific writer, in whose works a conception of the atomic theory exists

icumin A glucoside from the bark of *Lucuma glycyphloea* Colorless silky needles See *monesia*

idlamite $Fe_3(PO_4)_2$ A green mineral

udolf's number The ratio of the circumference of a circle to its diameter, usually termed π or pi = 3 14159,26535,89793,23846

udwig effect Soret effect

idwigite $3MgO \cdot B_2O_3$, Fe_3O_4 A blue or green mineral

idyl $C_{30}H_{26}O_8N_4S_2As_4Na$ Sodium salt of benzene-*m-3 3'*-disulfamino-bis-(*3*-amino-*4 4'*-dihydroxybenzene), used for syphilis

ietin An extract from killed cultures of *Treponema* bacteria used in skin tests for syphilis

luffa Vegetable sponge gourd towel washing sponge loofah The fibrous skeleton of the fruits of *Luffa cylindrica* a Cucurbitaceae used as a sponge

Lugol solution A solution containing 5 gm iodine and 10 gm (U S P) or 7 5 gm (B P C) potassium iodide per 100 cc Cf tincture of *iodine*

lukabro oil An oil from *Hydnocarpus anthelmintica*, of Siam, similar to hydnocarpus oil, d_{30}^{30} 943–0 950, n_D^{30} 1 4733–1 4753

Lully, Raymond 1235–1315 Ramon Lull Raymundus Lullus A Spanish alchemist and writer of alchemical books who described and prepared nitric acid aqua regia alcohol and potassium carbonate

lumarith Trade name for a cellulose acetate plastic

lumbang oil Candle nut oil A colorless oil expressed from the seeds of *Aleurites moluccana* candle nut d 0 923 insoluble in water soluble in alcohol or ether Used as an illuminant, in soap manufacture and in paints

lumen (1) A unit of luminosity or luminous flux, the light emitted by a point-source of one candle power 1 lumen = 0 001496 watt = 0 07958 spherical candle powers 1 lumen emitted per square foot has a brightness of 1 076 milli-lamberts 1 spherical candle power = 12 57 lumens (2) The bore of a small tube *E g*, the cavity of a thermometer tube, blood vessel, etc

luminal $C_{12}H_{12}O_3N_2$ = 232 2 Phenobarbital phenylethylbarbituric acid, phenylethylmalonylurea, *2 4 6*-trioxy-*5*-phenylethylpyramidine A white, odorless powder, m 172, insoluble in water, soluble in alcohol or ether, used medicinally as a hypnotic **l sodium** Sodium phenyl ethyl barbiturate Cf *luminol*

luminescence The emission of light at room temperature under the influence of various physical agents, as mechanical (tribo-l) electrical (electro-l), radiant (photo-l), thermal (thermo-l), or chemical (chemo-l) means Cf *fluorescence irradiation excitation, phosphorescence* **chemo-** The emission of light as a result

of a slow chemical reaction in which no appreciable increase in temperature takes place, as, by phosphorus, decaying wood fireflies *Cf phosphorescence, luminol* **crystallo-** The emission of light during crystallization, as, arsenous acid from HCl-solution or on crystallization after fusion **electro-** The emission of light due to the passage of electricity through gases at low pressure and temperature as in vacuum tubes **photo-** The emission of light on exposure to invisible radiations, hence the transformation from one wavelength into another, as, ultraviolet rays into visible rays According to the quantum theory the atoms become excited by the absorption of energy from radiations and on returning to normal they emit the energy previously absorbed in the form of their own characteristic radiations Cf *quantum, Bohr atom, spectrum, scattering, Raman effect* The intensity of l of some substances under the influence of ultraviolet rays from a mercury arc lamp or an ultraviolet argon lamp are

Intensity	*Color*
10 uranium nitrate	green
9 sodium salicylate	violet
9 anthracene	green
9 calomel	orange
9 caffeine	violet
8 phloroglucinol	blue
8 antipyrine	white
8 quinine salicylate	violet
8 salol	green
8 benzidine	blue
8 salicylic acid	blue
7 novocaine	violet
7 calcium gluconate	orange
6 aluminum tartrate	white
6 phthalic anhydride	violet
6 phenolphthalein	blue
5 atropine	white
5 potassium cyanide	blue
4 mercury salicylate	green
4 methyl salicylate	green
3 turpentine	blue
2 phenol	yellow

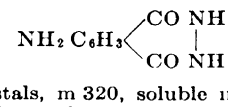
radio- The emission of light by radioactive substances **thermo-** The emission of light after slight heating as, by chlorophane **tribo-** The emission of light caused by friction or other mechanical means in which no rise of temperature takes place, as, by sugar crystals, calcium chloride quartz

luminiferous Giving off light without a rise in temperature Cf *incandescent*

luminoflavin A luminescent substance having a blue fluorescence which is produced by the irradiation of flavin with ultraviolet light, it occurs in urine and in plant products

luminogram A registered trade name for a photograph of the fluorescence of a substance produced by the action of ultraviolet light

luminol $C_8H_7O_2N_3$ = 170 04 *3*-Aminophthalhydrazide, *5*-amino-*1 4*-dihydroxyphthalazine,



White crystals, m 320, soluble in water The alkaline solution becomes brightly luminescent when treated with H_2O_2 and $K_3Fe(CN)_6$ Cf *luminal*

uminophore (1) A substance which gives off light at room temperature (2) An organic radical which produces or increases the luminescence of a compound

luminosity (1) The quantity of visible rays or light emitted by a body, measured in lumens (2) Luminescence

luminous Pertaining to luminescence **l flux** The radiant power of a substance, *e g*, its capacity to produce the sensation of light, the unit is the lumen **l intensity** The unit of brightness, candle power **l paint** A pigment which is luminescent or phosphorescent and glows in the dark after exposure to light, composed usually of the sulfides of calcium, barium and zinc, to which may be added a small quantity of a radioactive substance Used for watch dials, door knobs, signs, or electric switches

lumisterol Irradiated ergosterol Cf *cholane, vitamin D*

lumophore Luminophore

lunar caustic Fused silver nitrate **l cornea** Fused silver chloride

Lunge, Georg 1839–1923 A German chemist noted for work on technological analytical methods, (nitrometer), coal distillation and commercial production of chemicals **L nitrometer** Nitrometer

lupanine $C_{15}H_{24}ON_2$ = 248 3 An alkaloid from the seeds of *Lupinus angustifolius*, a Leguminosae A pale yellow, syrupy liquid of green fluorescence, slightly soluble in water, soluble in alcohol or ether **iso-** Matrine

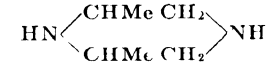
luparenol $C_{15}H_{24}O$ = 220 2 An unsaturated alcohol from the higher-boiling fraction of hop oil, b $_{3mm}$125–128

luparol $C_{16}H_{26}O_2$ = 250 20 A phenolic ether derived from luparone A colorless liquid d 0 9170, b $_{9mm}$123

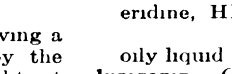
luparone $C_{13}H_{20}O$ = 194 17 A ketone derived from the higher-boiling fractions of hop oil A colorless liquid, d 0 8861, b $_{3mm}$75

lupeose $C_{12}H_{42}O_{21}$ = 666 32 A tetrasaccharide from lupine

lupetazin $C_6H_{14}N_2$ = 114 2 Dimethylpiperazine dipropylenediamine



A white crystalline powder, insoluble in water soluble in alcohol or ether, used as an antirheumatic

lupetidine $C_7H_{15}N$ = 113 2 2 6-dimethylpiperidine,  A colorless oily liquid

lupigenin $C_{17}H_{12}O_6$ = 312 1 A decomposition-product of lupinin

lupin(e) *Lupinus* A genus of leguminous plants, some are poisonous, others are cultivated as forage plants **l alkaloids** The alkaloids derived from *Lupinus* species, as, lupinine, lupinidine, arginine and their derivatives

lupinidine (1) $C_8H_{15}O_2N$ = 157 2 An alkaloid from the seeds of *Lupinus luteus* and *L niger* A yellowish syrupy liquid (2) Sparteine **l hydrosulfate** $(C_8H_{15}O_2N)_2 \cdot H_2SO_4$ = 412 4 Colorless crystals, soluble in water, used in medicine

lupinin $C_{29}H_{32}O_{16}$ = 636 3 A glucoside from various *Lupinus* species Yellowish crystals, soluble in alkali and hydrolysed to glucose and lupigenin Cf *lupinine*

nine $C_{21}H_{40}N_2O_2$ = 352 33 An alkaloid om the seeds of *Lupinus niger* and *Lupinus uteus* A colorless crystalline powder, m 67, 256, insoluble in water, soluble in alcohol, ther or chloroform Cf *lupinin* **anhydro-** $_{10}H_{17}N$ **dimethyl-** $C_{10}H_{17}ONMe_2$ **methyl-** $_{10}H_{18}ONMe$

ulin Humulin A bright, yellowish-brown ranular powder, of characteristic odor and op taste, consisting of the glandular trichomes om the strobiles of *Humulus lupulus*, hops, sed medicinally as a sedative and stomachic

ulinic acid $C_{32}H_{50}O_7$ = 546 5 The bitter rinciple of hops Brittle, large, rhombic risms of hop taste

ulon $C_{26}H_{38}O_4$ = 414 3 A constituent of the oft resin of hop lupulin Cf *humulon*

ulus Hops

us lapidis Stone consumption The decay f rocks due to the action of bacteria, yeasts nd molds, and not to weathering

er The reflection from the fractured surface f a rock metal or crystal

ron Trade name for a polystyrene plastic A mixture of fireclay and water used to eal cracks in or covers of crucibles

ecium Lu = 174 99 A rare earth metal, tomic number 71, valencies 3 and 4 It was iscovered (1905) by Auer von Welsbach and amed cassiopeium, and in 1907 by Urbain, and amed after Lutetia (= Paris) **1 chloride** uCl_3 = 281 5 White crystals, soluble in vater **1 oxide** Lu_2O_3 = 398 0 White powder, insoluble in water

ein (1) $C_{40}H_{56}O_2$ = 568 4 The carotenoid q v) coloring matter of egg yolk, consisting of 0 % xanthophyllin and 30 % zeaxanthin (2) yellow pigment from the fully-developed orpora lutea of the hog free from foreign aterial, dried and powdered **1 solution** solution of the water-soluble extractives of itein, used in medicine for injections in pregancy and for women's diseases

eo- A prefix, from the Latin, indicating range-yellow

eocompounds A series of yellow cobaltiammonium compounds *e g* , hexammincobaltichloride, $[Co(NH_3)_6]Cl_3$ The ammines of a etra-, tri- or bivalent metal of the general type, $M(NH_3)_6]X_3$ and $[M(NH_3)_6]X_2$

eol Oxychlordiphenylquinoxaline An indicator exceeding in its sensitiveness litmus and henolphthalein and more sensitive to ammonia than Nessler's reagent, it is yellow in lkali and colorless in acid solutions **1 solution** A solution of one gram of luteol in 100 cc lcohol, used as an indicator in volumetric nalysis

eole A carotene in yellow corn grain

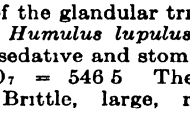
eolin $C_{15}H_{10}O_6$ = 286 08 Isofisetin Tetrahydroxyflavone A flavone derivative and a oloring matter of weld, *Reseda luteola* which vas used as a dye in Caesar's time Yellow, ilky shining crystals, m 328, insoluble in water, oluble in alcohol, alkalis, ether or benzene Used in dyeing silk and as a diuretic

eosalts See *luteo-compounds*

eosterone Progesterone

idine C_7H_9N = 107 07 Dimethylpyridine* A group of pyridine derivatives α- or alpha- or **2-** A colorless liquid, d 0 947, soluble in water β- or beta or **1 3-** A colorless liquid, used medicinally as an antispasmodic **2 4-** A colorless liquid, d 0 938, b 157, soluble in water **2 6-** The commonest lutidine obtained from tar and bone oils A colorless liquid, d 0 942, b 142, soluble in water **3 6-** A colorless liquid, b 163, soluble in water **dihydro-** See *dihydrolutidine* **hexahydro-** Lupetidine

lutidinic acid $C_7H_5O_4N,H_2O$ = 185 07 1 3-pyridine dicarboxylic acid* Colorless crystals, m 249, soluble in water or alcohol, insoluble in ether

lutidone C_7H_9ON = 123 1 2 4-dimethyl-3-oxypyridine,  Colorless crystals, m 225

lutol Aluminum borotannate

lux A unit of illumination 1 lux equals 1 lumen per square meter 1 lux = 1 lumen per m^2 = 0 0001 phot = 0 1 milliphot = $\frac{1}{10}$ foot-candle

luzidol Benzoyl peroxide

lyaconine Acolytine

lycetol $C_{10}H_{20}O_6N_2$ = 264 3 Lupetazin tartrate dimethylpiperazine tartrate Colorless crystals, m 243, soluble in water, used in medicine

lychnin A poisonous glucoside from *Lychnis* species, Caryophyllaceae

lycine $C_5H_{11}O_2N$ = 117 1 An alkaloid from the leaves of *Lycium halimifolium*, a Solanaceae White, hygroscopic, crystals, soluble in hot water or alcohol Cf *lysine*

lycoctonine $C_{27}H_{41}O_9N$ = 523 4 An alkaloid from the roots of *Aconitum lycoctonum*, a Ranunculaceae White crystals, m 100, insoluble in water, soluble in alcohol, or chloroform

lycopene $C_{40}H_{56}$ = 536 4 Licopin An unsaturated hydrocarbon and carotenoid (q v) pigment from many plants, as, tomato, etc , also in *Lycopersicum esculentum* Red crystals, m 168, isomeric with carotene, q v

lycopodium Vegetable sulfur A dry, light, yellow powder consisting of the inflammable spores of *Lycopodium clavatum*, a club-moss It is used as a dusting powder, microscope reagent, for coating medicinal pills, and formerly on the stage for producing flashes of light

lycorine $C_{16}H_{17}O_4N$ = 287 2 Narcissine An alkaloid from the bulbs of *Crinum giganteum*, *Lycoris radiata*, *Narcissus pseudonarcissus*, and other Amaryllidaceae species Colorless polyhedric crystals, decomp 250, slightly soluble in water, soluble in alcohol or ether, used medicinally as a substitute for emetine **dimethyl hydroxy-** Sekisanine

lyddite An explosive containing principally picric acid

lydian stone Jasper

lye (1) The alkaline solution obtained by leaching wood-ashes (2) A solution of sodium or potassium hydroxide Cf *ley*

lygosin $C_{17}H_{12}O_3Na_2\,7H_2O$ = 436 2 Sodium lygosinate, $CO(CH{=}CH{\cdot}C_6H_4ONa)_2$ Lustrous green crystals, soluble in water with a red color, used as a bactericide

Lyman series The first group of spectrum lines of hydrogen Cf *energy level*, *Balmer*, *Paschen series*

lymph A transparent slightly alkaline liquid, permeating the animal organism and resembling blood serum

lymphocyte A white blood-corpuscle with a single nucleus They constitute about 25 % of the white blood-corpuscles

lyochromes A group of natural water-soluble plant pigments Cf *carotenes*

lyophil(e) Attracting liquids A colloidal system in which the dispersed phase is a liquid and has an attraction for the dispersing medium Cf *hydrophile*

lyophobe Repelling liquids A colloidal system in which the dispersed phase is a solid and has no attraction for the dispersion medium, hence it is unstable and tends to separate Cf *hydrophobe*

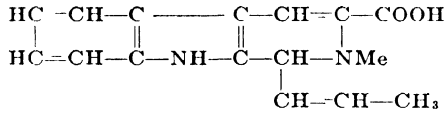
lyosorption The adhesion of a liquid to a solid, hence the adsorption of a solvent film on the surface of suspended particles Cf *adsorption*

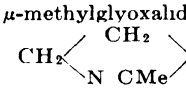
lyotrope (1) An ion or radical of a lyotropic series (2) A readily soluble substance

lyotropic series A number of ions, radicals, or salts, arranged according to their influences on different phenomena in colloid chemistry on physiological action or on catalytic effects which are due to the alteration of the properties of the solvent by the ions Thus the following salts appear always in the same order, although with some phenomena the order is reversed Potassium ferrocyanide > sodium citrate > sodium hydrogen phosphate > sodium fluoride > sodium sulfate > sodium tartrate > sodium thiosulfate > sodium acetate > sodium formate Cf *Hofmeister series*

lysatine $C_6H_{13}O_2N_3$ = 159 2 A crystalline alkaloid derived from casein

lysergic acid $C_{16}H_{16}N_2O_2$ = 270 14 A monobasic acid from ergot



lysidine $C_4H_8N_2$ = 84 1 Ethylene-ethenyl-diamine μ-methylglyoxalidine, methyldihydroimidazol,  Red, hygroscopic crystals, m 105, b 196, soluble in water, alcohol, or ether Used medicinally 1 **solution** A 50 % aqueous solution of l a yellowish or pinkish, soapy liquid used medicinally as a solvent for uric acid l **tartrate** Colorless crystals, soluble in water

lysimeter A device for determining approximately the solubility of substances

lysin An antibody which dissolves cells as, hemolysin bacteriolysin, cytolysin

lysine $C_6H_{14}O\ N_2$ = 146 32 α, ϵ-diaminocaproic acid, *2 6*-diaminohexanoic acid* NH_2-$CH_2\ CH_2\ CH_2\ CHO_2\ CHNH_2\ COOH$ An isolog of ornithine and an amino-acid in many proteins White needles, m 224, very soluble in water Usually prepared from casein, gelatin or protamines Cf *lycine, lysin* **hydroxy-** $C_6H_{14}N_2O_3$ = 162 32 An amino acid and constituent of proteins

lysis (1) The dissolution of a substance as the result of the action of a lysin, as hemolysis, cytolysis etc (2) The decomposition of a substance, as electrolysis and analysis (3) The cleavage of a bond or the decomposition of a compound accompanied by the addition of

H—OH, water	hydrolysis
H—NH_2, ammonia	ammonolysis
HO—C_2H_5, alcohol	alcoholysis
H—H hydrogen	hydrogenolysis

lysitol Lycetol

lysogen A substance which produces or generates a lysin

lysol Trade name for a solution of 50 % cresols and 50 % vegetable oil soap A brown oily liquid, soluble in water, used as an antiseptic and disinfectant

lysozyme The powerful antiseptic agent found in tears, in leucocytes, bodily secretions, egg albumin and turnips

lytic (1) Pertaining to lysins, *e g*, hemolytic, cytolytic (2) Pertaining to lysis, as hydrolytic, electrolytic

lyxose $C_5H_{10}O_5$ = 150 1 A pentose or pentatomic monosaccharide, which occurs in two optically active isomers d- and l- $(CHOH)_3$-O CH CH_2OH

M

(1) A symbol for metal, M^{I} a univalent, M^{II} divalent metal etc (2) An abbreviation for (*a*) mass (*b*) molal (*c*) molecular weight (*d*) mega or one million (*e*) the mathematical constant, $\log_{e}10 = 0.43429,44819\ (\mathbf{M})^{-1}$ The mathematical constant $\log_{e}10 = 2.30258\ 50930$

M acid *1*-Amino-*6*-naphthol-*4*-sulfonic acid

M A R An abbreviation for micro analytical reagent

M electron The e of the M shell or M orbit (q v), there are eight in the second and eighteen in the third and following periods

M orbit The third layer or energy-level, in which electrons move around the proton in the dynamic atom

M radiation A series of homogeneous x-rays characteristic of the metal used as anticathode and fainter than the K and L series They are assumed to be caused by electrons falling back to the M orbit

M series The spectral lines produced by the M radiations when they are diffracted through a crystal grating Cf *Moseley spectra*

M shell The third layer or energy level, in which electrons oscillate in the static atom

m An abbreviation for (1) meter (2) meta-position (3) milli or one-thousandth part

m² An abbreviation for square meter

m³ An abbreviation for cubic meter Cf *mm*, *mmm*

m An abbreviation for minim

μ The Greek letter "mu" (m) An abbreviation for (1) micron, (2) meso-position, (3) micro- or one-millionth of a unit (4) magnetic permeability Cf *mμ*, *μμ*

Ma The symbol for masurium

mA An abbreviation for milliampere

Maassen cylinder A porous unglazed porcelain cylinder used for filtering biochemical solutions See also *Mc*

Macaroni Long slender, stiff brittle tubes made a paste of the highly glutinous flour of hard Italian wheat If cooked it is edible

Macassar oil A yellowish-white fat of pleasant odor extracted from the seeds of *Schleichera trijuga* from India and the Malay States

Mace Macis The dried covering tissues of the seeds of *Myristica fragrans*, used as a condiment

Mace oil An essential oil from mace A colorless liquid of characteristic odor, d 0 91, soluble in alcohol or ether, used in flavoring agents of *nutmeg, otoba myristica, lawang oil*

Macene $C_{10}H_{18} = 138\ 1$ A liquid terpene from mace oil

Maceral A general name for the microscopic structures of coals

Macerate To steep or soften and break up a solid by soaking in water

Maceration The act of steeping or soaking a solid in a liquid

Mache unit [Heinrich Mache, Austrian physicist, 1876–] M E A unit of radioactive emanation The quantity of emanation which produces a saturation current of one-thousandth of an electro-static unit 1 curie = 2.8×10^{9} mache 1 mache = 3.64×10^{-10} curie/liter = 6.64 emanon

Mackay bean The dried seeds of *Entada scandens*, a leguminous plant of Queensland, used as a coffee substitute

Mackey test A test to determine the autoxidation fire hazards of oils

Maclaurin series A series of numbers expressed by the general equation

$$f(x) = f(o) + \frac{x}{1} f'(o) + \frac{x}{2} f''(o) + \frac{x_n}{n} f^{n}(o)$$

maclayine $C_{17}H_{8}O_{11} = 412\ 26$ An alkaloid derived from *Illipe maclayana* a Sapotaceae of the tropics

MacLeod, John James Rickard 1876–1935 A Scottish-Canadian biochemist noted as discoverer of insulin (with Banting) and Nobelist in 1924

macleyine Protopine

maclurin $C_{13}H_{10}O_{6}H_{2}O = 280\ 1$ Pentahydroxybenzophenone osage orange (q v), morin gatannic acid $C_{6}H(OH)_{2}CO\,C_{6}H_{2}(OH)_{3}$ The pale yellow coloring matter from the wood of *Maclura aurantiaca* A bright yellow crystalline powder m 200, soluble in hot water, alcohol or ether used as a dye

macro- A prefix derived from the Greek (*μακρός* broad), indicating "large

macroaxis The long axis in orthorhombic or triclinic crystals

macrobacterium A large bacterium

macrocarpine An alkaloid from *Thalictrum macrocarpum* a Ranunculaceae, yellow crystals, soluble in water

macrochemistry (1) The chemistry of chemical reactions which are seen by the naked eye Antonym microchemistry q v (2) Chemical operations on a large scale

macrodome See *dome*

macrofarad Megafarad

macrograph Photomacrograph

macroscopic Objects visible to the naked eye Antonym microscopic q v

macrotin Cumicifugin

macrotoid The combined principles from the root of *Cimicifuga racemosa* used in medicine as an antispasmodic

macrotys Cimicifuga

maculanin Potassium amylate

madder Turkey red, q v The dried and pulverized root of *Rubia tinctorum* and other species It contains several glucosides which yield, on fermentation, alizarin and purpurin Used in dyeing, and as a pigment in lakes Cf *garancin purpuroxanthic acid*

mafic A rock-forming material consisting mainly of magnesium and iron silicates

mafurite A mineral association of kieserite and augite (q v)

magdala red $C_{30}H_{21}N_{4}Cl$ Naphthalene red A safranine of the naphthalene series A dark brown powder, used as a dye for silk

magenta Fuchsin

magma (1) In geology a liquid molten rock, or the material from which igneous rocks have been formed (2) in pharmacy a suspension of a fine precipitate in water, *e g*, ferric hydroxide magma, magnesia magma Cf *milk*

magnalium An alloy of magnesium and aluminum containing from 2–10 % magnesium Used in the construction of airships, flying machines, balances, and automobiles

magnesia Magnesium oxide **calcined-** Magnesium oxide obtained by heating the carbonate **fluid-** A solution of magnesium bicarbonate (2 65 grams per 100 cc) **milk of-** See *milk* **ponderous-** Heavy magnesium oxide **m alba** A hydrated magnesium carbonate *m a levis* $4MgCO_3 Mg(OH)_2 5H_2O$ *m a ponderosa* $MgCO_3 Mg(OH)_2 4H_2O$ **m mixture** A clear, colorless liquid made by dissolving 55 gm $MgCl_2 6H_2O$, and 70 gm NH_4Cl in 650 cc water and adding 350 cc 10 % NH_4OH Used in analysis for precipitation of phosphates and arsenates **m niger** An early name for pyrolusite **m usta** Magnesium oxide

magnesian limestone Limestone containing variable amounts (about 10 %) of magnesite

magnesioferrite A spinel, $MgFe_2O_4$

magnesite $MgCO_3$ A native magnesium carbonate, used as a refractory lining for furnaces and kilns and in medicine as a substitute for plaster of Paris

magnesium Mg = 24 32 An alkaline earth-metal element, atomic number 12, valency 2 A silver-white metal, d 1 74, m 651, b 1120, insoluble in water, decomp or dissolved by all acids with the formation of the corresponding salts It occurs in nature in magnesite and dolomite (carbonates), serpentine asbestos talcum, biotite and meerschaum (silicates), in Stassfurt salts and mineral waters, and in sea water The metal was first obtained by electrolysis (1830) by Liebig and Bunsen Magnesium forms only one series of compounds which yield the Mg^{++} magnesium ion in aqueous solutions It is manufactured in bars, sheets ingots, ribbons wire, and powder Used in electric batteries, in construction of airships and flying machines, in flash-light powders, and pyrotechnics, as a deoxidizer in making brass and for thermite **m acetate** $Mg(C_2H_3O_2)_2 4H_2O$ = 214 4 Colorless monoclinic crystals, d 1 45, soluble in water or alcohol **m acid citrate** $MgHC_6H_5O_7 5H_2O$ = 304 4 Citrasia A white, odorless crystalline substance of pleasant acid taste, soluble in water, used as a laxative and purgative **m alkyl compounds** A series of organic compounds of the general type, MgX_2, where X is an alkyl radical, *e g*, $MgEt_2$ = magnesium ethide **m alkyl condensation** Grignard reaction **m aluminate** $MgAl_2O_4$ = 142 26 Spinel Colorless cubic crystals, d 3 6, m 2135, insoluble in water, used as refractory **m ammonium arsenate** $MgNH_4AsO_4 6H_2O$ = 289 4 Colorless tetragonal crystals soluble in water **m ammonium chloride** $MgCl_2 NH_4Cl 6H_2O$ = 254 4 A white, crystalline powder, soluble in water used in magnesia mixture, q v **m ammonium phosphate** $MgNH_4PO_4 6H_2O$ = 245 6 Colorless, tetragonal crystals, d 1 71, decomp by heat into magnesium pyrophosphate, soluble in water or acids **m ammonium sulfate** $MgSO_4(NH_4)_2SO_4 6H_2O$ = 360 4 Colorless crystals, soluble in water **m arsenide** Mg_3As_2 = 222 88 Decomp by water **m aryl compounds** A series of organic compounds of the general type, MgX_2, where X is an aryl radical, *e g*, $MgPh_2$ = magnesium diphenyl **m benzoate** $Mg(C_7H_5O_2)_2$ = 266 4 A white powder, soluble in water, used as an antiseptic **m bicarbonate** A solution of $MgCO_3$ in carbonated water **m bichromate** $MgCr_2O_7$ = 240 3 Orange-brown, hygroscopic crystals, soluble in water **m biphosphate** $MgH_4(PO_4)_2$ = 218 4 Acid magnesium phosphate, monobasic magnesium phosphate A yellow, crystalline powder, insoluble in water or alcohol, soluble in acids, used as a laxative **m bisulfate** $MgH_2(SO_4)_2$ = 218 3 Acid magnesium sulfate A colorless crystalline powder, soluble in water, used as a cathartic **m borate** $Mg(BO_2)_2$ = 109 9 Antifungin A white powder, soluble in water used as an antiseptic **m boride** An insoluble powder of doubtful composition **m boro-citrate** $Mg_2(BO_2)C_6H_5O_7$ = 280 6 A colorless powder, soluble in water, used as an antiseptic **m bromate** $Mg(BrO_3)_2 6H_2O$ = 388 3 Colorless crystals, soluble in water, decomp by heat **m bromide** $MgBr_2 6H_2O$ = 292 25 Colorless, hexagonal crystals, decomp by heat, soluble in water, used for the electrolytic preparation of magnesium, and in medicine as a sedative **m butyrate** $Mg(C_4H_7O_2)_2$ = 198 4 Colorless hygroscopic crystals, soluble in water **m cacodylate** $Mg(AsMe_2O_2)_2$ A white powder, soluble in water **m calcium chloride** Tachhydrite **m carbide** (1) MgC_2 = 48 32 (2) MgC_3 = 60 32 **m carbonate** $MgCO_3$ = 84 32 Magnesite dolomite, heavy m carbonate Colorless rhombic, crystalline powder, d 3 04, decomp 350, slightly soluble in water, soluble in acids or carbonated water Used in the preparation of magnesium salts, fireproofing compositions, and pharmaceutical preparations (tooth-paste) *basic-* $4MgCO_3 Mg(OH)_2 5H_2O$ = 485 7 Magnesia alba levis, light m carbonate, magnesii carbonas (U S P) Very light, white powder, d 2 18, slightly soluble in water, soluble in ammonia, used medicinally as a dusting powder, antiacid, and laxative *heavy-* Magnesia alba ponderosa *light-* Basic magnesium carbonate **m chromate** $MgCrO_4 7H_2O$ = 266 4 Orange-yellow crystals, m 100, soluble in water **m chlorate** $Mg(ClO_3)_2 6H_2O$ = 299 2 A hygroscopic, colorless, crystalline powder, m 40, soluble in water, used medicinally in ointments for skin diseases **m chloride** $MgCl_2$ = 95 21 Fused magnesium chloride anhydrous m chloride White, crystalline masses, d 2 17, m 708, soluble in water Used in the manufacture of metallic magnesium, for fireproofing for magnesia cements, composition floorings and artificial stones *hydrated-* $MgCl_2 6H_2O$ = 203 3 Crystallized magnesium chloride Colorless, bitter, hygroscopic crystals, d 1 57, m 100, decomp 186, soluble in water or alcohol Used in medicine as a saline cathartic, commercially for disinfectants, fireproofing, and dressing cotton fabrics **m citrate** $Mg_3(C_6H_5O_7) 14H_2O$ = 703 1 Colorless scales, soluble in water, used in pharmaceutical preparations *effervescent-* A granular mixture of magnesium citrate sodium bicarbonate, citric acid and sugar, used medicinally as a saline laxative **m copper**

alloy An alloy used as activator for the Grignard reaction **m dioxide** M peroxide **m dust** Finely powdered, magnesium metal used in pyrotechnics, for photographic flashlights, and as a chemical reagent **m ethide** $Mg(C_2H_5)_2$ = 82 4 A colorless liquid **m ethyl bromide** EtMgBr = 133 23 Grignard's reagent, used in organic synthesis **m fluoride** MgF_2 = 62 3 A white powder, d 2 47, m 1396, insoluble in water, native as sellaite Used as an antiseptic, in ceramics and in glass **m fluosilicate** $MgSiF_6$ = 166 6 M silicofluoride A white powder, used in ceramics *hexahydrate-* $6H_2O$ = 274 38 Trigonal crystals, d 1 788, soluble in water **m formate** $Mg(CHO_2)_2\,2H_2O$ = 150 3 Colorless prisms, soluble in water, insoluble in alcohol or ether, used in analysis **m glycerinate** $Mg(C_3H_5O_4)_3$ = 339 4 A white powder, soluble in water **m glycerinophosphate** $Mg(C_3H_7O_2)PO_4$ = 194 4 M glycerophosphate A white powder, soluble in water, used medicinally for anemia **m glycerophosphate** M glycerinophosphate **m halides** A group of organic compounds of the general type, RMgX, (see *Grignard reagent*) where R is an aryl or alkyl radical, and X, a halogen (Cl, Br, I or F) **m hydrate** M hydroxide **m hydrosulfide** $Mg(HS)_2$ = 90 44 An unstable compound, which on warming, yields pure hydrogen sulfide **m hydroxide** $Mg(OH)_2$ = 58 34 M hydrate Brucite White, rhombohedric crystals, or white powder, d 2 36, decomp on heating It is insoluble in water, soluble in ammonium salt solutions, used in the manufacture of magnesium oxide, milk of magnesia, and in refining sugar **m hypophosphite** $Mg(H_2PO_2)_2\,6H_2O$ = 262 5 Colorless crystals, soluble in water Used as a tonic **m hyposulfite** M thiosulfate **m iodate** $Mg(IO_3)_2,\,4H_2O$ = 446 22 A crystalline powder, soluble in water, decomp by heat **m iodide** MgI_2 = 278 2 A colorless powder decomp by heat, soluble in water, alcohol, or ether *hydrated-* $MgI_2\,8H_2O$ = 422 33 A colorless, hygroscopic, crystalline powder, soluble in water, used in medicine **m lactate** $Mg(C_3H_5O_3)_2\,3H_2O$ = 256 4 White crystals, soluble in water, insoluble in alcohol or ether Used as a laxative **m lactophosphate** M phospholactate A white powder soluble in water, used in medicine **m laurate** $Mg(C_{12}H_{23}O_2)_2$ = 422 68 Colorless crystals, m 150 4 **m lime** Lime or quicklime containing 20 % or less of MgO **m magma** An aqueous suspension containing 7–8 5 % $Mg(OH)_2$, with a flavoring agent Cf *milk of magnesia* **m malate** $MgC_4H_4O_5$ = 156 3 Colorless crystals, soluble in water, used as a laxative **m minerals** Magnesium is one of the most abundant metals, and is an essential constituent of rocks (olivines, micas, pyroxenes, and amphiboles)

magnesite	$MgCO_3$
dolomite	$(Mg, Ca)CO_3$
talc	Silicates
chlorite	Silicates
serpentine	Silicates
kieserite	$MgSO_4$
boracite	MgB_4O_7
brucite	$Mg(OH)_2$

m molybdate $MgMoO_4$ = 184 3 Colorless crystals, soluble in water **m myristate** $(C_{14}H_{27}O_2)_2Mg$ = 478 74 White powder, m 131 6 **m nitrate** $Mg(NO_3)_2\,6H_2O$ = 256 4 Colorless monoclinic or triclinic crystals, d 1 46, m 90, soluble in water or alcohol Used as a reagent and in pyrotechnics, decomp by heat **m nitride** Mg_3N_2 = 100 98 A yellow-green amorphous mass, decomp by water **m nitrite** $Mg(NO_2)_2\,2H_2O$ = 152 31 Colorless hygroscopic crystals soluble in water Used as a reagent **m oleate** $Mg(C_{18}H_{33}O_2)_2$ = 587 0 M oleinate A yellowish, oily mass, insoluble in water, soluble in oils, alcohol, or ether Used as a varnish drier **m oxalate** $Mg(OOC)_2\,2H_2O$ = 148 4 Colorless crystals, d 2 45, soluble in water used in organic synthesis **m oxide** MgO = 40 3 Magnesia, calcined magnesia, perilase, ponderous magnesia, magnesia usta A white, regular or hexagonal, crystalline powder, d 3 43 m 1900, insoluble in water, soluble in acids or ammonium salt solutions Used commercially in packings and heat insulations, refractories rubber and paper manufacture medicinally, as a dusting powder, antiacid, and laxative *heavy-* Amorphous m oxide, obtained by heating basic m carbonate d 3 58 *light-* Crystalline m oxide obtained by heating m carbonate d 3 36 See also *m peroxide* **m palmitate** $Mg(C_{16}H_{31}O_2)_2$ = 535 0 A white, soap-like mass, m 120, insoluble in water, soluble in alcohol, used as a varnish drier **m peptonate** A yellowish powder, slightly soluble in water, used medicinally in stomach disorders **m perborate** MgB_4O_7 = 179 6 A white powder soluble in water, used in dryers **m perchlorate** $Mg(ClO_4)_2$ = 223 23 Anhydrone A porous white granulated substance used as a regenerable desiccant **m perhydrol** M peroxide **m permanganate** $Mg(MnO_4)_2\,6H_2O$ = 370 3 A granular, dark blue mass, soluble in water used as an antiseptic **m peroxide** MgO_2 = 56 3 M superoxide, m dioxide A white powder containing 25 % MgO_2 and 75 % MgO insoluble in water Used as a reagent to detect bilirubin, medicinally, for gastric disturbances, also used for bleaching silk and wool **m phosphate** $Mg_3(PO_4)_2\,4H_2O$ = 179 6 Tribasic or normal m phosphate A colorless monoclinic crystalline powder, insoluble in water *acid-* $MgHPO_4\,7H_2O$ = 246 5 Dibasic or m orthophosphate A colorless hexagonal crystalline powder, d 2 13, insoluble in water, soluble in dilute acids, used medicinally as an alterative and antirheumatic *dibasic-* Acid m phosphate *monobasic-* M biphosphate *pyro-* $Mg_2P_2O_7\,3H_2O$ = 276 77 Colorless crystals, d 2 40, insoluble in water *tribasic-* M phosphate See also *m ammonium phosphate* **m phosphide** Mg_3P_2 = 135 01 A dark powder, decomp by water **m phosphite** $MgHPO_3$ = 104 3 A colorless crystalline powder, soluble in water **m phospholactate** M lactophosphate **m propionate** $Mg(C_3H_5O_2)_2$ = 170 4 A white powder, soluble in water **m pyrophosphate** See *m phosphate* **m rhodanate** M thiocyanate **m salicylate** $Mg(C_7H_5O_3)_2\,4H_2O$ = 233 4 A white, crystalline powder, soluble in water, used as an antirheumatic, antifermentative and intestinal antiseptic **m silicate** $MgSiO_4$ = 116 6 A fine white powder, insoluble in water, used as an astringent, and in the manufacture of rubber **m silicides** (1)

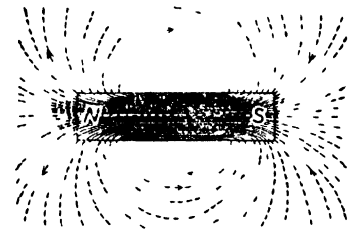
Mg_2Si = 76 70 (2) $MgSi$ = 52 38 (3) Silicon magnesium **m silicofluoride** M fluosilicate **m stearate** $(C_{18}H_{35}O_2)_2Mg$ = 590 - 86 Dolomol A white, soap-like powder, m 132 **m succinate** $MgC_4H_4O_4$ = 140 3 A white powder, soluble in water **m sulfate** (1) $MgSO_4$ = 120 4 Anhydrous m sulfate A white powder, d 2 66, soluble in water (2) $MgSO_4 2H_2O$ = 156 4 *Dihydrate*, desiccated m sulfate A white powder, soluble in water (3) $MgSO_4 7H_2O$ = 246 5 *Heptahydrate*, crystallized m sulfate, epsom salt, Magnesii sulfas (U S P), bitter salt Colorless tetragonal or monoclinic crystals, d 1 67, decomp by heat, soluble in water or alcohol Used as a reagent, for loading and warp-sizing cotton goods and textiles, fireproofing, in mineral waters, as a constituent of bleaching solutions, in the paper and leather industries, in electrical batteries, and medicinally, as a saline cathartic and refrigerant (4) $MgSO_4 H_2O$ = 138 4 Kieserite d 2 3 **m sulfide** MgS = 56 4 Brown cubical crystals, d 2 82 decomp by heat soluble in water **m sulfite** $MgSO_3 6H_2O$ = 212 4 A white crystalline powder, m 260, soluble in water, insoluble in alcohol Used as an antiseptic and cathartic **m sulfocyanide** M thiocyanate **m tartrate** $C_6H_4O_6Mg 5H_2O$ = 262 43 White monoclinic crystals, d 1 67, slightly soluble in water *acid-* $MgH_2(C_4H_4O_6)_2 4H_2O$ = 394 46 White rhombic crystals, d 1 72, soluble in water **m thiocyanate** $Mg(CNS)_2$ = 140 3 M rhodanate Colorless, hygroscopic crystals soluble in water Used as a reagent **m thiosulfate** $MgS_2O_3 6H_2O$ = 244 4 M hyposulfite Colorless crystals, soluble in water Used medicinally as an antiseptic **m tungstate** $MgWO_4$ = 272 3 M wolframate Colorless crystals, insoluble in water or alcohol, soluble in acid solutions It becomes fluorescent in X-rays and is used for fluorescent screens and luminous paints **m urate** $MgC_5H_2O_3N_4$ = 190 3 A white amorphous powder, insoluble in water or alcohol **m valerate** $Mg(C_5H_9O_2)_2$ = 226 4 A white powder, soluble in alcohol Used medicinally as a sedative **m wolframate** M tungstate

magneson *p*-Nitrobenzene azo-resorcinol **m - II** p-Nitrobenzene azo-α-naphthol

magnesyl The monovalent radical —MgX of the Grignard reagent

magnet A lodestone or iron that attracts iron **bar-** A rod or bar of magnetized soft iron **electro-** A piece of iron rendered temporarily magnetic by an electric current passing through a coil wound around it **horse-shoe-** A bar of iron first magnetized and then bent into U-shape

magnetic Pertaining to or possessing magnetism **m declination** The deviation of the compass needle from the true axis of the earth owing to the magnetic pole not being coincident with the geographic north or south pole **m deflection** The deflection of radioactive rays or particles by a magnetic field according to the sign and magnitude of their charges **m elements** The elements of the iron family all of which show perceptible magnetism, other elements have only very slight magnetic properties **m field** The region or the lines of force in the space around the magnetic poles of a magnet *atomic-* The magnetic region around an atom **m flux** The state existing in a magnetic circuit, which is proportional to the strength of the magnetic poles, and is measured by the total number of lines of force round the coil and circuit Magnetic flux = μH, where μ is the magnetic permeability and H the intensity of the field of force **m force** The force (F) that acts on a magnetic pole, it depends on the strengths of the pole and of the field The strength or intensity of a magnetic field (H) at a point is equal to the number of dynes (m) which act on a unit magnetic pole at the point, hence, F = m $\times$ H **m guard** A mask of magnetised steel wire gauze, used to protect workers from iron dust **m induction.** The m flux per unit of area taken perpendicularly to the direction of the magnetic flux Cf *induction* **m intensity** The magnetic moment per unit volume **m iron ore** Magnetite **m meridian** The direction registered by a compass needle at any place **m moment** Pole strength $\times$ length of magnet **m optic** See *magneto-optic* **m ore** (1) Magnetite (2) A magnetic ore **m permeability** The value of the total magnetic induction in a unit field, (μ) It is a measure of the force (F) of repulsion between two rigid magnetized poles (m and m') a distance r apart F = μ(m m')/r^2 Cf *magnetic flux* **m phenomena** The effects produced in a magnetic field, *e g*, the *Ettinghausen-, galvanometric- Hall-, Joule- Leduc- Nernst-, thermomagnetic-, Wiedemann-* effects **m polarization** The optical activity acquired by an optically-inactive substance when placed in a magnetic field **m pole** The point on which magnetic lines of force converge **m p strength** See *magnetic units* **m potential** Magnetomotive force **m pyrite** Pyrrhotite **m reluctance** The ratio magnetomotive force/flux **m rotation** Magnetic polarization *specific-* The ratio of the m rotation of the substance to that of water under the same conditions **m separator** A device usually a powerful electromagnet, for separating magnetic iron ore from non-magnetic minerals **m spectrum** The pattern produced by iron filings scattered on a plane surface in a magnetic field It illustrates the lines of force See *m field* **m susceptibility** (1) The susceptibility of a substance to magnetism (2) The magnetic intensity produced in a substance compared with the intensity of the magnetic field which produces it **m units** (a) Quantity A unit pole is the quantity of magnetism that repels another unit pole with a force of one dyne (b) Intensity The intensity of magnetization, or pole strength per unit area (c) Field strength The number



Magnetic field

of lines of force which cross a unit area in normal direction, a unit for one line per unit area = gauss (d) Magnetic flux unit the maxwell

agnetism (1) The property of substances, like iron which under certain conditions attract or repel each other or a like substance (2) The science of magnetic phenomena **electro-** M due to induction currents **ferro-** M due to iron and independent of an electric current **photo-** See *photomagnetism*

agnetite FeO Fe_2O_3 Magnetic iron ore, hercules stone, lodestone A native ferrous-ferric oxide, a black, dense mass with magnetic properties Cf *ferriferrous oxide*

agnetization The act of rendering magnetic **specific-** See *specific m*

agneto-electricity A current of electricity produced by magnetism Compare electro-*magnetism* (magnetism produced by electricity)

agnetometer A device for measuring magnetic force

agnetomotive force M M F The amount of work required to bring a unit quantity of positive (attractive) magnetism from zero to a certain potential

agneton A ring of negative electricity assumed to consist of an electron traveling in a circular motion with the velocity of light **m theory** A theory of atomic structure in which magnetons form octets, similar to the electrons of Lewis-Langmuir theory It has been developed by Parsons and others

agneto-optic effect A time lag observed in m rotation which is characteristic for and used to detect minute quantities of substances **m rotation** Magnetic rotation, magnetic polarization A beam of polarized light is rotated when passing through a magnetic field The amount of rotation depends upon the strength of the field, the wavelength of light and the kind of matter through which the polarized light passes The magnetic rotation of a substance is usually read at 15°C , with monochromatic light (sodium flame), and a length of liquid of one decimeter Cf *Verdet's constant*

agnification An enlargement or increase in size, *e g* , produced by a reading glass, microscope stereopticon, or telescope

agnifier A lens used to read accurately, thermometer scales, burette scales, balances and other instruments

agnify To increase the apparent size of an object by means of lenses

agnifying power The ratio of the actual size of an object to the amplified image of that object Cf *auxiometer*

agnitude Any measurement taken of an object Cf *units, constants, length* and tables or *mass, time, velocity, temperature* **astronomical-** The size of a star, measured in the terms of its brightness

agnochromite A variety of chromite containing magnesium

agnoliaceae A family of trees and shrubs including

Drimys	drimin, drimol
Illicium	staranise, sikimin
Liriodendron	liriodendrin, tulipiferine
Magnolia	magnolin
Michelia	champakol

magnolin A crystalline glucoside from the fruit of *Magnolia tripetala*, a Magnoliaceæ, insoluble in water, soluble in ether

magnolite $HgTeO_4$ A white mineral

magnolium An alloy of 90 % Pb and 10 % Sb

Magnus, Albertus 1193–1280 Albrecht, Graf von Bollstädt A German philosopher the founder of the European school of alchemists

Magnus, Heinrich Gustav 1802–1870 A German chemist, noted for research in physical and inorganic chemistry **M rule** There is for each metal a specific voltage at which it is deposited from a solution containing a mixture of metallic salts **M salt** The first of the platin-ammonium compounds, discovered by Magnus in 1828 Dark green needles, slightly soluble in water tetramin-plato-tetrachloro-platinate, $Pt(NH_3)_4PtCl_4$

main cell An accumulator consisting of an amalgamated zinc cathode and a lead dioxide anode suspended in sulfuric acid, *2* 5 volts

maisin A protein from maize

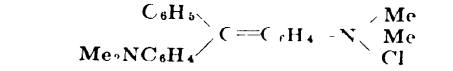
maize Indian corn The seeds of *Zea mays* used as a cereal Cf *zea, corn starch* **m oil** Corn oil A yellow oil d_{15}^{0} 0 915–0 920

maizolith An insulating material, obtained from cornstalks and corncobs and pressed into sheets

majolica A lustrous pottery enameled with a tin oxide composition

malachite $Cu_2(OH)_2CO_3$ A green basic copper carbonate, forming dense, smaragd or emerald green masses, which may be polished Azurite is a blue variety **azur-** A bluish-green m from Arizona **blue-** Azurite **pseudo-** $Cu_3(PO_4)_2H_2O$ Phosphocalcite Phosphochalcite A green native copper phosphate

m green (1) Pulverized malachite used as a pigment (2) Victoria green benzal green A triphenylmethane dye



Dark green, shining crystals, soluble in water Used as a reagent for detecting sulfites in the presence of thiosulfates also for bacteriological staining solutions It is a pH indicator changing at 1 0 from yellow (acid) to blue-green (alkaline) **leuco-** See *leucomalachite*

malacolite Augite

malacon An impure zircon

Malaguti, Faustino Jovita 1802–1878 An Italian-born French chemist, noted for his work on the mass-action of salts

malakin $C_{15}H_{15}ON$ = 225 2 Salicylal-p-phenetidine, EtO C_6H_4 N CH $C_6H_4(OH)$ Small yellow needles, m 92, insoluble in water soluble in ether, used as an antirheumatic

malakograph An apparatus which measures the rate of softening of wax by means of a falling weight attached to an arm which carries an indicator

malamide $C_4H_8O_3N_2$ = 132 2 *2*-Hydroxybutanediamide*, malic amide The diamide of malic acid, $NH_2CO\,CH_2\,CHOH\,CONH_2$ Colorless crystals m 156 Cf *aspargine malonamide*

malarin $C_{17}H_{19}ON$ = 253 15 Acetophenonephenetidine, EtO C_6H_4 N=CMe C_6H_4Me A yellowish crystalline powder, used as an antipyretic

malate A salt of malic acid, which contains the bivalent —OCO CH_2 CHOH COO - radical

Malay camphor *d*-Borneol

malchite A variety of diorite containing quartz, feldspar, hornblende and biotite

maldonite A slightly pink native alloy of gold and bismuth, Au_2Bi

male fern Aspidium **m f oil** An essential oil distilled from the rhizome of *Dryopteris filix-mas* Colorless liquid, d 0 85, b 150, used in flavoring extracts It contains hexyl and octyl esters of fatty acids

male hormone See *androsterone, cholane derivatives*

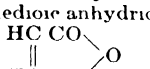
maleamic acid $C_4H_5O_2N$ = 99 1 Amino-maleic acid, maleinamic acid, maleamidic acid, $NH_2CO\,CH\,CH\,COOH$ Colorless crystals m 152

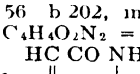
maleate Any salt of maleic acid which contains the bivalent —OCO CH CH COO— radical

maleic acid $C_4H_4O_4$ = 116 1 Ethylene dicarboxylic acid, *cis*-butanedioic acid* An unsaturated dibasic acid, $HOOC\,CH\,CH\,COOH$ Colorless prisms, d 1 59, m 130, soluble in water alcohol or ether decomp by heat It is an isomer of fumaric acid

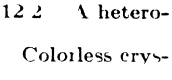
ethylenedicarboxylic acid

maleic acid fumaric acid

amino- Maleamic acid **methyl-** Citraconic acid **m anhydride** $C_4H_2O_3$ = 98 04 *cis*-butenedioic anhydride* A heteroatomic pentacycle  Colorless, trimetrical crystals d 0 93, m 56 b 202, insoluble in water

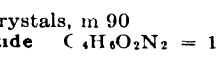
m hydrazine $C_4H_4O_2N_2$ = 112 2 A heteroatomic hexacycle  Colorless crystals, m 250, used in organic synthesis

maleinamic acid Maleamic acid

maleinanil $C_{10}H_7O_2N$ = 173 1 

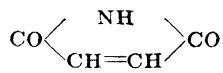
Colorless crystals, m 90

maleinhydrazide $C_4H_6O_2N_2$ = 114 1



maleinhydrazine $HOOC\,CH\,CH\,CONH\,NH_2$

maleinimide $C_4H_3O_2N$ = 97 1



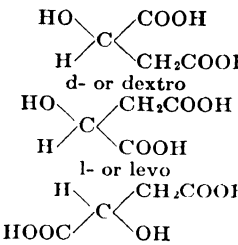
malenoid The cis-form of geometrical isomerism

as compared with the trans-form (fumaroid)

maletto tannin $(C_{19}H_{20}O_9)_n$ A brown powder, from the bark of *Eucalyptus occidentalis*, soluble in water or alcohol

maleyl The bivalent $C_4H_2O_2<$ radical, derived from maleic acid

malic acid $C_4H_6O_5$ = 134 07 Oxyethylene-succinic acid, butanoldiacid, hydroxysuccinic acid, hydroxybutane dioic acid* A dibasic hydroxy acid in unripe fruits It is an intermediate in metabolism, and exists in three isomeric forms



i- or inactive, or dl-

dextro-, (*d*)- Colorless needles d 1 59 m 133, soluble in alcohol, water, or ether **inactive-,** (*dl*)- Colorless crystals, d 1 60 m 129 soluble in water, alcohol, or ether decomp by heat **iso-** Methyltartronic acid The isomer $Me\,COH(COOH)_2$ A white solid m 160 (decomp), soluble in water alcohol or ether **levo-,** (*l*)- Common in Colorless crystals d 1 595 m 100 decomp 140 Cf *acetic acid* **β-hydroxy-** Tartaric acid **methyl-** Citramalic acid

m amide Malamide

mallardite A vitreous fusible, yellow or white, native manganese sulfate, $MnSO_4\,7H_2O$

malleability The quality of tenacity and ability to withstand hammering out or rolling into thin sheets, without fracture or returning to the original shape

malleable Capable of being hammered or shaped by hammering or by pressure **m casting** A small iron casting, which is made malleable by heating

mallee bark The bark of *Eucalyptus occidentalis*, from which a commercial grade of eucalyptus oil is distilled

Mallet, John William 1832 1912 An Irish-born American chemist, noted for atomic weight determinations

mallophene $C_{11}H_{11}N_5\,HCl$ = 249 6 Phenylazo-α-diaminopyridine hydrochloride $PhN=N\,C_5H_2N(NH_2)_2\,HCl$ A dark red powder, soluble in water or alcohol, used as dental and surgical antiseptic Cf *mallophanic acid*

mallotoxin Rottlerin

mallow Malva The dried leaves of *Malva sylvestris* and other *M* species, used as herb-teas **marsh-** Althaea

malol Ursolic acid

malon oil Black fish oil An oil from the pilot whale *Globicephalus melas*

malonaldehydic acid $C_3H_4O_3$ = 88 03 Formylacetic acid, $CHO\,CH_2\,COOH$ An isomer of peruvic acid

malonamic acid $C_3H_5NO_3$ = 103 03 The half-amide, $COOH\,CH_2\,CONH_2$ of malonic acid

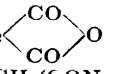
malonamide $C_3H_6O_2N_2$ = 102 1 Propanediamide*, malonic diamide The diamide $NH_2CO\,CH_2\,CONH_2$ Colorless crystals m 170 Cf *malamide*

malonanilic acid $C_9H_9O_3N$ = 179 1 The monobasic acid, $PhNH\,CO\,CH_2\,COOH$ Colorless crystals, m 132

malonanilide $C_{15}H_{14}O_2N_2$ = 254 1 $PhNH\,CO\,CH_2\,CO\,NHPh$ Colorless crystals m 232

lonate A salt of malonic acid of the type $M_2C_3H_2O_4$

lonic acid $C_3H_4O_4$ = 104 1 Propanedioic acid*, methane dicarboxylic acid The dibasic acid, $CH_2(COOH)_2$, propandiacid, occurring n many plants Colorless triclinic crystals, n 132 (decomp), soluble in water, alcohol or ther **allyl-** See *allyl malonic acid* **bromo-** $CHBr(COOH)_2$ = 183 01 Colorless needles, lecomp 112, soluble in water **butyl-** $CHBu(COOH)_2$ = 160 09 *n-* White crystals, m - 101 5 *iso-* m 107 *sec-* m 76 **cetyl-** $C_{19}H_{36}O_4$ = 328 29 White solid, m 121 **chloro-** $CHCl(COOH)_2$ = 138 48 Colorless crystals, n 133 **diethyl-** $CEt_2(COOH)_2$ = 160 09 White powder, m 121 **dimethyl-** $CMe_2(CO-OH)_2$ = 132 06 Colorless crystals, m 193 **ethyl-** $CHEt(COOH)_2$ = 132 06 White crys- als, m 111 5, decomp 160 Cf *pyrotartaric, dutaric acid* **ethylene** Vinaconic acid **hy- droxy-** Tartronic acid **keto-** Mesoxalic acid **methyl-** *Isosuccinic acid* **nitril-** Cyanacetic acid **oxo-** Mesoxalic acid **oxy-** Tartronic acid

m anhydride $C_3H_2O_3$ = 87 1 

n amide $C_4H_6O_2N_2$ = 168 1 $CH_2(CONH_2)_2$ Colorless needles, m 170, slightly soluble n water, insoluble in alcohol, used in organic synthesis **m dinitrile** Malononitrile **m ester** $C_7H_{12}O_4$ = 160 08 Diethyl malonate, $CH_2(COOEt)_2$ A colorless liquid, d 1 055, n 50, b 198 Its two H are replaceable by Na and these sodium compounds react with alkyl halides yielding homologs of malonic ester **m e synthesis** Synthesis of complex ompounds by use of m e and sodium

lonitrile $C_4H_4N_2O$ = 96 0 Malic dinitrile hicvanoethanol, CN CHOH CH_2 CN

lononitrile $C_3H_2N_2$ = 66 1 Propanedini- rile* malonic dinitrile, methylene cyanide, $CH_2(CN)_2$ White powder, m 30, b 218 soluble n water, alcohol or ether, used in organic synthesis

lonurea Veronal Cf *malonyl urea*

lonyl- The bivalent radical —OC CH_2 CO— lerived from malonic acid **m urea** Bar- bituric acid, cf *malonurea*

lourea Barbital

lt Maltum The grain of *Hordeum dis- tichum* or *H sativum* (barley), which has been partly germinated, then dried Yellow grains of agreeable odor and sweet taste Used as a nutritive and digestant, and in the manu- acture of malt extract, and beer **m extract** Extractum malti A dark brown syrupy iquid obtained by evaporating an infusion of nalt, used as a tonic, starch digestant and mulsifying agent **m liquor** An alcoholic beverage derived from fermented infusions of nalt as beer

ltase Genease An enzyme in yeast, blood- erum, lymph, salivary, pancreatic and intes- inal juices, which hydrolyzes maltose to lextrose, used in brewing

ltha A tar or pitch resulting from the oxida- ion and drying up of petroleum Dark asphalt-like masses, insoluble in water, soluble n benzene

lthenes Petrolenes

ltobionic acid $C_{12}H_{22}O_{12}$ = 358 2 An oxida- ion-product of maltose

ltobiose Maltose

maltodextrin Amylom A polysaccharide, which is converted to maltose by hydrolysis Con- stitutionally it is midway between dextrin and maltose, and it is produced from the starch material of barley during modification in the manufacture of malt Its composition depends on the relative amounts of maltose and dextrin

maltonic acid *d*-Gluconic acid

maltosazone $C_{12}H_{14}O_7(N NHPh)_4$ The osa- zone of maltose, used in the synthesis of $C_{220}H_{142}O_{68}N_4I_2$ = 4021 0 (Hepta-tribenzoyl-galloyl-p- iodophenyl maltosazone), the largest molecule so far synthesized (by Emil Fischer)

maltose $C_{12}H_{22}O_{11}H_2O$ = 360 2 Maltsugar, glucose-α-glucoside A dextro disaccharide ob- tained from malt and starch Colorless crys- tals, $[\alpha]_D$ +138°, soluble in water or alcohol Used as a sweetening agent, and is fermentable, being an intermediate formed in brewing dis- tilling and vinegar manufacture **iso-** Gentiobiose

maltsugar Maltose

maltum Malt

malva Shallow

Malvaceae Mallow family, a group of mucilagi- nous plants

Althaea officinalis	marsh-mallow
Althaea rosea	hollyhock
Hibiscus abelmoschus	musk seed
Malva sylvestris	mallow
Gossypium herbaceum	cotton-plant

malvidin The blue aglucone of the glucoside malvin in wild mallow

malvin A glucoside and anthocyan pigment from mallow

malvon $C_{29}H_{36}O_{20}$ = 704 3 An oxidation-prod- uct of malvin and the glucoside of a didepside sugar ester

mammary gland The dried mammary gland of the sheep A yellow powder with slight odor, partly soluble in water, used medicinally for menorrhagia

man The highest, living organism of the third group of living beings See *life* The ele- mentary composition of the human body has been calculated as follows

oxygen	66 0 %
carbon	17 6 %
hydrogen	10 1 %
nitrogen	2 5 %
calcium	1 5 %
phosphorus	1 0 %
potassium	0 4 %
sodium	0 3 %
chlorine	0 3 %
sulfur	0 25 %
magnesium	0 04 %
iron	0 004 %
Si, F, I	traces

manaca The dried root of *Brunfelsia hopeana*, a Brazilian Solanaceae The fluid extract is used as a diuretic and diaphoretic, and contains francisceine

manacine Vegetable mercury An alkaloid from manaca used as diuretic and diaphoretic

manchester brown Triaminoazobenzene

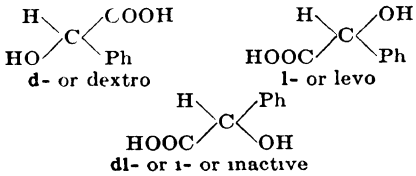
mancona bark Erythrophloeum

mancophalolic acid $C_{10}H_{30}O_2$ = 184 3 An amorphous resinous acid from Manila copal

mandarine (1) The reddish-yellow fruit of *Citrus nobilis* (2) Orange II, β-naphtholorange A monoazo dye, $C_{10}H_6(OH)N NC_6H_4SO_3H$ **m**

oil The essential oil from m , b 175–179, containing limonene, citral and methyl anthranilate

mandelic acid $C_8H_8O_3$ = 152 1 Phenylglycollic acid amygdalic acid amygdalinic acid, α-hydroxy-α-toluic acid, phenylhydroxyacetic acid, benzoylglycolic acid An aromatic hydroxy acid occurring in three isomeric forms



inactive-, *dl-* Colorless rhombic crystals, d 1 36, m 118, soluble in water, alcohol or ether **levo-**, **l-** The natural form from amygdala, m 133 **para-** Inactive **amino-** Hydrindic acid **methyl-** Atrolactic acid **phenyl-** Benzilic acid

Mandelin's reagent A reagent for alkaloids 0 5 gm vanadium oxide or chloride in 100 cc conc sulfuric acid

mandelonitrile C_7H_7ON = 133 06 *dl*-Benzaldehyde cyanohydrin, benzalcyanhydrin, Ph-CH(OH)CN A yellow oily liquid, d 1 124, m −10, b (decomp) 170, insoluble in water, used in organic synthesis

mandioc Tapioca

mandragorine $C_{17}H_{23}O_3N$ = 289 2 An alkaloid from the seeds and roots of *Mandragora officinalis*, a Solanaceae of the Orient Colorless, odorless, deliquescent crystals, m 78 Used as a narcotic and sedative

mandrake Podophyllum

mandrel A handle or shaft in which a rotating tool is held

manelemic acid A constituent of elemi, α-$C_{37}H_{56}O_4$, and β- $C_{44}H_{80}O_4$

mangal A non-corrosive aluminum alloy containing 1 5 % manganese

mangan Manganese **m blende** A native manganese sulfide, MnS

manganate A salt containing the bivalent MnO_4= radical **per-** A salt containing the monovalent MnO_4— radical

manganese Mn = 54 93 A metallic element, atomic number 25, valencies 2, 3, 6, and 7 A grayish-pink, lustrous, brittle metal, d 7 42, m 1207, b 1900, insoluble in water, reacting with boiling water soluble in acids Used in alloys with iron, copper, and silicon Metallic manganese was discovered in 1774 by Scheele, isolated in 1789 by Gahn, and named from the Greek manganidso (purify) in allusion to the use of its dioxide in the manufacture of glass, it neutralizes the green color due to iron compounds Manganese forms several series of compounds according to its valency

Valence number		Ions	Color of compounds	Oxide
2	manganous	Mn^{++}	slightly pink	MnO
3	manganic	Mn^{+++}	slightly green	Mn_2O_3
4	manganites	MnO_3^{--}	green	MnO_2
6	manganates	MnO_4^{--}	dark green	
7	permanganates	MnO_4^-	dark purple	Mn_2O_7

black- Pyrolusite **dvi-** Rhenium **eka-** Masurium **red-** (1) Rhodonite (2) Rhodochrosite **m acetate** Manganous acetate **m binoxide** M dioxide **m blende** A native manganese sulfide, MnS **m boride** MnB_2 = 76 6 A black powder, insoluble in water **m boron** A bronze containing manganese 88 % Cu, 10 % Sn, 2 % Mn **m carbide** Mn_3C = 177 1 A black crystalline mass **m chloride** See *manganic manganous* **m copper** M bronze **m dioxide** MnO_2 = 86 93 M peroxide, pyrolusite battery manganese Black, amorphous powder d 5 03 decomp 390 insoluble in water, soluble in acids Used as an oxidizing agent, in the manufacture of chlorine and other halogens, in electric dry cells, in paints and varnishes, as a black or purple color for glass glaze, enamel and ceramics, for making ferromanganese and manganese compounds in the rubber industry, medicinally, as a tonic and alterant **m glaze** A dark-colored lustrous enamel on porcelain containing manganese **m green** Barium manganate **m heptoxide** Mn_2O_7 = 221 86 Permanganic acid anhydride A dark green liquid, rapidly decomp to MnO_2 a most powerful oxidizing agent **m minerals** Manganese occurs in nature in small quantities widely diffused in most rocks and minerals The principal ores are

pyrolusite	MnO
psilomelane	$Mn(OH)_3$
braunite	Mn_2O_3
hausmannite	Mn_3O_4
manganite (manganese spar, rhodochrosite)	MnO(OH)
mangan spar (rhodonite, manganite)	$MnCO_3$
mangan blende	MnS

m nitrides There are two nitrides Mn_5N_2 = 302 67 Mn_3N_2 = 192 81 **m oxides** (1) MnO, *manganous oxide* (2) Mn_3O_4 *manganic manganous oxide* (3) Mn_2O_3, *manganic oxide* (4) MnO_2, *manganese dioxide* (5) MnO_3, *manganese trioxide* (6) Mn_2O_7, *manganese heptoxide* **m peroxide** M dioxide **m protoxide** Manganous oxide **m sesquioxide-** Manganous manganic oxide **m silicate** Mn_2SiO_4 See *braunite*, *rhodonite*, *tephroite* **m spar** (1) Rhodonite (2) Rhodochrosite **m steel** A steel containing about 12 % Mn, which is extremely hard and ductile, used in machinery that is subject to hard wear, *e g* , crushers **m sulfate** See *manganic*, *manganous* **m tetrachloride** $MnCl_4$ = 196 77 A green solid **m tetrafluoride** MnF_4 = 130 93 A brown solid **m titanium** An alloy of m and titanium, used in the steel industry **m trioxide** MnO_3 = 102 93 An acidic oxide which forms manganates, *e g* , K_2MnO_4 **m tungstate** See *hübnerite*

manganesium Manganesum An early name for manganese

manganic Describing compounds of trivalent manganese They are generally unstable and yield in aqueous solution the green Mn^{+++} ion, which readily decomposes to the stable Mn^{++} state (manganous) **m acid** H_2MnO_4 = 120 9 An acid unknown in the free state but existing in salts of the type M_2MnO_4—, manganates **per-** $HMnO_4$ = 119 9 A dark red unstable liquid It forms salts of the type $MMnO_4$—, permanganates **m chloride** $MnCl_3$ = 161 3 An unstable compound which forms more stable double salts, soluble in water, and decomposes to $MnCl_2$ and Cl_2 **m hydrox-**

ide $Mn(OH)_3 = 106.1$ An unstable hydroxide, which rapidly loses water and forms a brown crystalline precipitate, MnO(OH) of d 4.4, insoluble in water, decomp by acids Used as a pigment for textiles **m manganous oxide** $Mn_3O_4 = 228.79$ Manganomanganic oxide A red insoluble, crystalline solid **m metaphosphate** $Mn_2(PO_3)_6 2H_2O = 620.13$ Pink crystals **m oxide** $Mn_2O_3 = 157.9$ Manganese trioxide, m sesquioxide, black m oxide, braunite A black powder, d 4.33, insoluble in water but soluble in acids *hydrated-* $Mn_2O_2(OH)_2 = 175.88$ A black powder **m sulfate** $Mn_2(SO_4)_3 = 398.1$ Dark green crystals, decomp by water or at 160, used as a powerful oxidizing agent in synthesis

manganiferous Containing or carrying manganese

manganin A non-corroding alloy of 12% Mn, 84% Cu and 4% Ni, d 8.4, m 910 Used in electric rheostats and heating elements

manganite $Mn_2O_3 H_2O$ Acerdese A native manganic oxide hydrate

manganites A series of compounds derived from tetravalent manganese and its hydroxide $Mn(OH)_4 = H_4MnO_4$ by replacement of the hydrogen, hence a salt containing the tetravalent MnO_4 radical or the divalent MnO_3 radical

$$H_4MnO_4 = H_2MnO_3 + H_2O$$

mangano-manganic oxide Manganic-manganous oxide

manganosiderite A native carbonate of manganese and iron

manganosite MnO A native manganous oxide, occurring in emerald green, isometric masses

manganostilbite A mineral consisting of MnO with As_2S_3 and Sb_2S_3

manganotantalite A mineral consisting of MnO and Ta_2O_5 Sn and W

manganous The more common manganese salts containing the divalent Mn^{++} ion usually colorless or slightly pink, soluble in water **m acetate** $Mn(C_2H_3O_2)_2 4H_2O = 245.0$ M acetate Pale red, monoclinic crystals, d 1.59, soluble in water or alcohol **m ammonium phosphate** $MnNH_4PO_4 H_2O = 186.0$ Manganese ammonium phosphate Colorless crystals, soluble in water **m ammonium sulfate** $Mn(NH_4)_2(SO_4)_2 = 283.1$ M alum Pale rose crystals, soluble in water, used as a reagent **m arsenate** $MnHAsO_4 = 195.0$ Manganese arsenate A pale rose powder, slightly soluble in water Used medicinally as a hematinic, nutritive and alterative tonic **m benzoate** $Mn(C_7H_5O_2)_2 = 297.1$ Manganese benzoate Colorless scales, soluble in water, slightly soluble in alcohol **m borate** $MnB_4O_7 = 265.1$ Manganese borate, manganese siccative A white powder, soluble in water, used as a drier in varnishes and paints, and in the leather industry **m bromide** $MnBr_2 = 214.8$ Manganese bromide Rose red crystals, soluble in water **m butyrate** $Mn(C_4H_4O_2)_2 = 229.2$ Manganese butyrate A rose red, crystalline powder, soluble in water or alcohol, used for acute streptococcal infection **m cacodylate** $Mn(Me_2AsO_2)_2 = 329.1$ Manganese cacodylate Pale, rose red crystals, soluble in water, used as a tonic **m carbonate** $MnCO_3 = 114.9$ Manganese carbonate native as dialogite and rhodochrosite Rose colored, rhombic crystals d 3.13 decomp by heat insoluble in water soluble in dilute acids Used medicinally for anemia **m chloride** *anhydrous-* MnCl = 125.9 Rose red crystals, d 2.98 m 650 soluble in water *hydrous-* $MnCl_2 4H_2O = 197.7$ Rose red, monoclinic crystals, d 1.91, m 87, soluble in water slightly soluble in alcohol Used medicinally in chlorosis and as an antiseptic in gargles, technically, as a mordant, in the manufacture of manganese salts, in the glass industry, as a disinfectant, and for regeneration of manganese dioxide **m chromate** $MnCrO_4 = 171.1$ Manganese chromate A dark brown powder, partly soluble in hot water **m citrate** $MnHC_6H_5O_7 = 245.1$ Manganese citrate A white powder, soluble in water, used medicinally as a tonic and astringent **m dithionate** M hyposulfate **m ferrocyanide** $Mn_2Fe(CN)_6 = 322.0$ Manganese ferrocyanide A pale green powder insoluble in water, soluble in cyanide solutions **m fluoride** $MnF_2 = 93.0$ Manganese fluoride A rose red powder, soluble in water **m fluosilicate** $MnSiF_6 6H_2O = 305.08$ Rose red hexagonal prisms, d 1.903, soluble in water **m formate** $Mn(OOCH)_2 2H_2O = 180.98$ Rhombic, red crystals, d 1.953 soluble in water **m glycerinophosphate** $MnC_3H_7O_3PO_3 = 225.0$ Manganese glycerophosphate A rose red, crystalline powder soluble in water, used medicinally as a tonic **m glycerophosphate** M glycerinophosphate **m hydrate** M hydroxide **m hydroxide** $Mn(OH)_2 = 89.0$ Manganese hydroxide, native as pyrochroite A white hexagonal, crystalline powder, d 3.26 insoluble in water, soluble in acids, decomp if heated **m hypophosphite** $Mn(H_2PO_2)_2 H_2O = 203.0$ Manganese hypophosphite Rose red crystals, soluble in water, used medicinally for anemia and chlorosis **m hyposulfate** $MnS_2O_6 = 215.1$ Manganese dithionate Colorless needles, soluble in water **m iodide** $MnI_2 4H_2O = 183.8$ Manganese iodide Rose colored monoclinic crystals, decomp by heat, soluble in water, used medicinally as an antiseptic, tonic, and alterant **m lactate** $Mn(C_3H_5O_3)_2 3H_2O = 287.1$ Manganese lactate Pale rose, crystals soluble in water or alcohol, used medicinally as a tonic **m lead resinate** Manganese lead resinate A mixture of lead and manganese resinates, used as a drier in varnishes and paints **m linoleate** $Mn(C_{18}H_{31}O_2)_2 = 613.1$ Manganese linoleate A dark brown fatty mass, insoluble in water, soluble in oils, used in driers for varnishes and paints **m metaphosphate** M phosphate **m nitrate** $Mn(NO_3)_2 6H_2O = 287.1$ Manganese nitrate Rose red, monoclinic crystals, d 1.82, m 25.8 b 129, decomp 230, soluble in water, used as a reagent **m oleate** $Mn(C_{18}H_{33}O_2)_2 = 617.6$ Manganese oleate A brown, granular, fatty mass, insoluble in water, slightly soluble in alcohol, soluble in ether or oils Used medicinally in ointments, and as a drier for varnishes **m oxalate** $Mn(OOC)_2 2\frac{1}{2}H_2O = 188.0$ Manganese oxalate A white, crystalline powder, d 2.45 decomp 150, slightly soluble in water soluble in acids Used for the preparation of metallic magnesium, and as a drier **m oxide** MnO = 70.9 Manganese protoxide A grayish-green powder, d 5.09, insoluble in water, soluble in acids *manganic-* $Mn_3O_4 = 228.8$ Mangano-manganic oxide, manganous manganite A brownish-black powder, d 4.61

used as a reagent in chemical analysis **m peptonate** Manganese peptonate A brown powder, soluble in water, used medicinally as a nutritive and tonic **m phosphate** (1) *ortho-* $Mn_3(PO_4)_2\,7H_2O$ = 481 0 Normal manganese phosphate Red amorphous powder, insoluble in water, slightly soluble in alcohol, soluble in dilute acids Used as a reagent, and medicinally as a tonic (2) *meta-* $MnHPO_4$ = 150 97 Manganese metaphosphate Pale rose crystals soluble in water, used in analysis (3) *pyro-* $Mn_2P_2O_7$ = 283 9 Manganese pyrophosphate A white amorphous powder, d 3 58, insoluble in water **m propionate** $Mn(C_3H_5O_2)_2$ = 201 0 Manganese propionate A pale rose powder, slightly soluble in water **m pyrophosphate** M phosphate **m salicylate** $Mn(C_7H_5O_3)_2$ = 329 1 Manganese salicylate A white, crystalline powder, soluble in water or alcohol Used medicinally as a tonic and antirheumatic **m silicate** $MnSiO_3$ = 131 2 Manganese silicate Pale red crystals, d 3 35, m 1218, insoluble in water Used in ceramics and the glass industries **m succinate** $Mn\text{-}C_4H_4O_4$ = 171 0 Manganese succinate A white crystalline powder, soluble in water **m sulfate** (1) *anhydrous-* $MnSO_4$ = 151 0 Manganese sulfate, native as mallardite Red crystals, d 2 95, soluble in water (2) *tetrahydrate-* $MnSO_4\,4H_2O$ = 223 1 Labile, rose red prisms, slightly hygroscopic, d 2 11, m 30, soluble in water Used medicinally as a tonic and carthartic, in the ceramic and glass industries, as a mordant in the textile industry (3) *pentahydrate-* $MnSO_4,\,5H_2O$ = 241 08 Stable at 8–27 (4) *heptahydrate-* $MnSO_4\,7H_2O$ = 277 10 Red prisms, d 3 1, m 542 **m sulfide** MnS = 87 0, or $MnS\,H_2O$ = 105 0 Manganese sulfide, native as alamandite and mangan blende A gray to pink to brown fusible powder, d 3 93, insoluble in water, soluble in acids, used as a pigment **m sulfite** $MnSO_3$ = 135 0 Manganese sulfite A gray, crystalline powder, insoluble in water, soluble in dilute sulfurous acid Used medicinally **m sulfophenate** $Mn(C_6H_4OH\,SO_3)_2$ = 401 1 Manganese phenolsulfonate Red crystals, soluble in water or alcohol, used medicinally as an antiseptic and tonic **m tannate** Manganese tannate A compound of Mn and tannin A brown powder, insoluble in water soluble in acids **m tartrate** $Mn\text{-}C_4H_4O_6$ = 203 1 Manganese tartrate A white crystalline powder, slightly soluble in water **m valerate** $Mn(C_5H_9O_2)_2\,2H_2O$ = 293 2 Manganese valerate A brown powder, slightly soluble in water, used as a tonic

manganum The Latin term for manganese

mangiferin $C_{19}H_{18}O_{11}$ = 422 2 Euxantogen A principle from the leaves of *Mangifera indica*, thin, pale yellow needles, m 271

mango The tree *Mangifera indica*, an Anacardiaceae of India **m gum** A resin from the mango tree, amber colored or reddish-yellow lumps

mangrove An extract from the bark of *Rhizophora mucronata*, containing 30–35 % tannin, used in tanning Cf *cutch*

Manihot A group of South American shrubs and herbs (Euphorbiaceae) which yield cassava, Brazilian arrowroot cassareep and ceara rubber

Manila copal A resin from *Agathis dammara*, a conifer of the Philippine Islands It contains 80 % of manilacopalic acid **M hemp** Abaca **M paper** A strong paper made from old M rope (M fibers)

manioc Cassava

manioca Tapioca

manna The dried saccharine exudation of *Fraxinum ornus*, an Oleaceae of the Orient It contains mannite, and forms a yellowish-white mass of sweet, slightly acrid taste Used medicinally as a mild cathartic **Armenian-** A m from oak trees, containing glucose **Australian-** A m from the eucalyptus species, containing melitose Cf *lerp* **yeast-** Yeast gum

mannan A glucoside constituent of yeast gum, and manna, analogous to araban

mannide $C_6H_{10}O_4$ = 146 08 An anhydride of mannitol, b 317 **iso-** A solid, m 87, b 274

mannitan $C_6H_{12}O_5$ = 164 3 An anhydride of mannitol A syrupy liquid, m 100, or crystals, m 137

mannite Mannitol

mannitol $C_6H_{14}O_6$ = 182 2 Mannite A hexatomic alcohol obtained from manna and many plants (larch, celery, sugar cane, *Viburnum*, *Opulus*, *Syringa* and *Fraxinus* species), occurring in two isomeric forms dextro- and levo- Colorless needles, d 1 52, m 166, b $_{1mm}$ 278 soluble in water or alcohol Used medicinally as a mild laxative, and chemically as a reagent for detecting glucose **m nitrate** $C_6H_8(ONO_2)_6$ = 452 15 Hexanitrin, nitromannite, nitromannitol, d 1 604 Insoluble in water, and soluble in ether, m 108 It explodes on further heating, and is used as a substitute for mercury fulminate in high explosives

mannitose Mannose

mannoheptitol Perseitol

mannoheptonic acid $C_7H_{14}O_8$ = 226 11 White solid, decomp 175, soluble in water

mannoheptose $C_7H_{14}O_7$ = 210 11 A heptose m 134, in the avocado, the fruit of *Persea gratissima*, a Lauraceae

mannolite Chlorazene

mannonic acid $C_6H_{12}O_7$ = 196 1 d-, l-, or i- An acid derived from mannitol, which forms its lactone (q v) on heating **m lactone** $C_6H_{12}O_6$ = 180 1 d- A solid, m 150,

mannosans Polysaccharides $(C_6H_{10}O_5)_n$, which hydrolyze to mannose

mannose $C_6H_{12}O_6$ = 180 1 $CH_2OH(CHOH)_4\text{-}CHO$ A hexose or fermentable monosaccharide and isomer of glucose occurring in two optically-active forms and obtained from manna **dextro-** Seminose Colorless prisms, d 1 539, m 132, soluble in water or alcohol

mannoside A glucoside which yields mannose Cf *rhamnomannoside*

mannotriose $C_{18}H_{32}O_{16}$ = 504 25 Glucose-galactose-galactoside A trisaccharide from manna, indigestible by man and hydrolyzed to glucose and 2 galactose molecules

manocryometer A device for determining the melting point of substances under pressure

manometer An instrument for measuring the pressure of gases or liquids **differential-** A glass instrument for measuring pressures up to 20 mm water pressure **gas-** See *gage McLeod steam gage* **mercury-** A U-tube filled with mercury, the difference in the heights in the arms indicates the pressure **photo-** A m adapted for making a photographic record of the pressure changes (see figure) **sphygmo-** An instrument for measuring blood pressure **spring-** A manometer constructed from a coiled

tube into which the gas or steam passes and, according to its pressure, uncoils and records on the dial. Cf. *McLeod*. **water-** A U-tube filled with water, with one side open and the other connected to the gas container. The difference

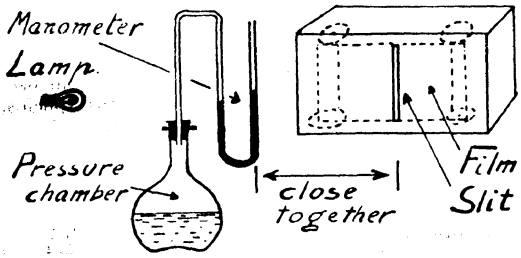


Photo-manometer.

in the heights of the water columns indicates the pressure.

MANOMETERS
(*Behar's Classification*)

(1) Low pressure

Ionization gage	0.0001–0.1μ Hg.
pyrometric gage	0.001–1μ Hg.
resistance gage	0.01–1μ Hg.
McLeod gage	0.01–1000μ Hg.
Micromanometer	0.01–10 mm.

(2) Atmospheric pressure

U-tube	1–1000 mm.
single tube	2–2000 mm.

(3) High pressure

spring manometer	0.5–10 lb.
diaphragm	0.5–200 lb.
carbon pile	50–2000 lb.
crystals	100–20000 lb.
steel-tube spiral	1000–10000 lb.

manoscopy. Gas-volumetric analysis.

mantle. The outer wall of a furnace. **filter-** Berkefeld filter. **gas-** Welsbach mantle.

manure. Refuse (*e.g.*, excreta, straw, etc.), used as a fertilizer. **m. salt.** A potassium salt (chiefly chloride) containing 20–30 % potash.

AVERAGE COMPOSITION OF MANURES

	% N_2	% P_2O_5	% K_2O
cattle manure	0.58	0.28	0.53
horse manure	0.59	0.34	0.52
sheep manure	0.68	0.40	0.75
yard manure	0.51	0.33	0.53

manzoul. A mixture of hashish and muscat nut, used as a narcotic.

mapharsen. $C_6H_6NO_2As$ = 198.98. *m*-amino-*p*-hydroxy phenyl arsine oxide, $NH_2(OH)C_6H_3$-AsO; used as an antisyphilitic.

maple. The tree *Acer saccharum* (in U.S.) or *Acer campestris* (in Britain). **red-** The bark of *Acer rubrum*, swamp m., used by American Indians for sore eyes. **m. sugar.** A brown mass obtained by evaporating m. syrup. It is chiefly sucrose with small amounts of glucose, coloring matter and proteins. **m. syrup.** The concentrated sap of *A. saccarum*, which yields 2–4 lbs. per tree.

Maranta. Arrowroot.

marble. $CaCO_3$. A native calcium carbonate, which occurs in many forms and colors and is limestone recrystallized under the influence of heat and/or pressure.

marc. (1) The residual vegetable tissue and mucilage which remains after expression of oil from a plant or nut kernel. (2) The cellular tissue left after complete extraction of the juice of the sugar beet or sugar cane. Cf. *bagasse*.

marcasite. FeS_2. Coal brass. A native iron sulfide, pale yellow, orthorhombic crystals, sometimes called white iron, spear, binarite, coxcomb, or radiated pyrites.

Marcet, Alexander. 1770–1822. A Swiss physician, who became an English chemist and noted lecturer-demonstrator.

Jane Marcet.

Marcet, Jane Haldemand. 1769–1858. A Swiss writer and exponent of popular science, noted for her "Conversations on Chemistry."

Marchand, Richard Felix. 1813–1850. A German chemist, noted for atomic weight determinations. **M. tube.** A U-shaped, calcium chloride tube, with bulb and side-tube attached.

marcitine. $C_5H_{19}N_3$ = 157.1. A basic substance obtained from putrid pancreas.

Marcy tambour. A writing point attached to a drum-like membrane; used in physiological work.

marennin. A green pigment from certain oysters on the French coast, which is derived from the chlorophyll of microorganisms which infest them.

maretin. $C_8H_{11}ON_3$ = 165.11. m-tolyl semicarbazide, m-tolylhydrazine carbonate, MeC_6H_4-$NH.NH.CONH_2$. Colorless crystals, m.184, insoluble in water or alcohol, soluble in acetone or chloroform; used as an antirheumatic.

margaric acid. $C_{17}H_{34}O_2$ = 270.4. Heptadecanoic acid*, heptadecylic acid, daturic acid. A saturated fatty acid (q.v.) occurring in lichens but also synthesized. Colorless mass, d.0.853, m.60, $b._{100mm.}$227, insoluble in water, soluble in alcohol or ether. Cf. *dorosmic acid*.

margarine. A butter substitute which consists of a solid emulsion of fats in milk serum. **oleo-** The liquid fat from which margarine is made by hydrogenation, which saturates the double bond.

margarite. $CaAl_4H_2Si_2O_{12}$. A native calcium aluminum silicate, forming lustrous, pearly, monoclinic masses of various shades.

margaron $(C_{16}H_{33})_2O$ = 466 7 Dihexadecyl ether A white, odorless powder from beef suet, used as an ointment base

margaronitrile $C_{17}H_{33}N$ = 251 27 Heptadecane nitrile*, cetylcyanide, *n*-hexadecylcyanide, $Me(CH_2)_{15}CN$ White crystals, m 53

Marggraf, Andreas Sigismund 1709–1782 A German chemist, the founder of the beet sugar industry

margosa oil Neem oil, veepa oil, veppam fat, oil of azedarach An oil from the seeds of *Melia azedarach* the bead tree, Indian lilac, Cape syringa or China tree, a Meliaceae of Asia and Africa

margosic acid $C_{22}H_{40}O_2$ = 336 4 A fatty acid obtained from margosa oil, probably impure oleic acid

margosine An alkaloid from the bark of *Melia azadirachta*, the Indian lilac tree Colorless crystals, m 175 Cf *azedarine*

marialite The vitreous, green mineral, 2NaCl, $2Na_2O,3Al_2O_3,18SiO_2$

Marie Davy cell A voltaic cell, which consists of amalgamated zinc, in dilute sulfuric acid as anode and carbon in a paste of mercurous sulfate, as cathode (1 5 volts)

Marignac, Jean Charles Galissard de 1817–1894 A Swiss (Geneva) chemist, noted for determinations of atomic weights, and investigations of rare earth metals **M salt** Potassium stannosulfate

marigold Calendula

marihuana Hashish

marinating Pickling in brine

Mariotte, Edme 1629–1684 A French prior and experimenter, noted for his gas law **M law** The product of volume and pressure of a gas is constant (1676) Cf *Boyle s law*

marjoram The herbs, *Origanum*, of the Labiatae **sweet-** The herb and leaves of *O major*, used as tonic and emmenagogue **wild-** The herb of *O vulgare*, used as a stimulant It yields origanum oil **m oil** An essential oil from *Origanum majorana*, a Labiatae An odorless liquid, d 0 9, in soluble in water, soluble in alcohol or ether, used in perfumery and for scenting soap Cf *origanum oil* **French-** The essential oil of *Calamintha nepeta*, a Labiatae containing calaminthone

marker An electric instrument for registering small time intervals on smoked paper used in physiological work

marking To brand or label **m apparatus** A device which takes the place of the objective in a microscope, and is used to make small circles on the cover-glass marking desired fields for future reference **m ink** A solution of silver nitrate, used to mark textiles **m nut** Seme-carpus

Markownikoff's rule (1) In the addition reaction of two organic molecules at a *low* temperature the least hydrogenated carbon atom of one will combine with the most negative element of the other whereas, at a *higher* temperature, it will combine with the more positive element or radical (2) When the additive agent adds as H and R, the latter goes to the carbon atom with the smaller number of H atoms

marl (1) An earth consisting of clay, sand, and chalk (2) An earthy or soft rock deposit rich in calcium carbonate

marmatite A native zinc, iron, and manganese sulfide

Marme's reagent A solution of 6 gm KI and 3 gm CdI_2 in 18 cc water Used as a reagent for alkaloids, most of which generally form a white or yellowish precipitate with it

marmite (1) An earthenware vessel for boiling large volumes of bouillon or media (2) A trade name for a food prepared by treating yeast with an acid under pressure and neutralising the product

Marne, N H [Johann Bernhard Herrmann] A German phlogistic chemist who attempted the first classification of elements, 1786, *Ueber die Anzahl der Elemente*

maroti oil A fatty oil, d 0 96 expressed from the seeds of *Hydnocarpus wightiana*, a Flacourtiaceae Cf *chaulmoogra oil*

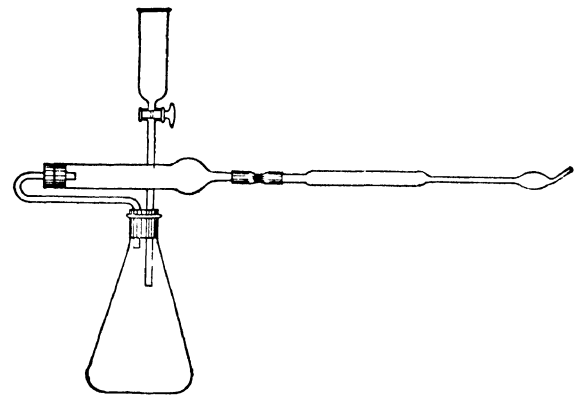
marri-kino A red gum from *Eucalyptus calophylla*, a Myrtaceae, used in tooth powders

marrubiin $C_{21}H_{28}O_4$ = 344 22 The active principle from the leaves of *Marrubium vulgare*, a Labiatae Colorless scales m 155, b_{15mm}297, slightly soluble in water, used medicinally as a tonic

marrubium Horehound

marsh gas The gaseous products chiefly methane, formed from decaying, moist organic matter in marshes and mines Cf *firedamp* **m mallow** Althaea **m mint** Wild mint The herb, *Mentha sativa*, a Labiatae, used as an emetic and stimulant **m ore** Bogore **m tea** Labrador tea

Marsh, James 1789–1846 An English chemist **M test** Marsh-Berzelius test A test for arsenic The substance is added to pure zinc in a gas-generating bottle Pure hydrochloric acid is slowly added, and the evolved hydrogen, together with the arsenic hydride, AsH_3, is passed through a long tube which is heated near



Marsh test apparatus

the end so that a deposit of As forms, or the escaping hydrogen is ignited, and a cold porcelain dish is held above the flame The As deposits on it as a black mirror that can be dissolved in KOCl solution, while the Sb deposit does not dissolve

Marshall apparatus A device for the determination of urea in blood

marshmallow Althaea

Martens densitometer An optical device for measuring the density of the silver deposit on photographic plates **M illuminator** A photometer for determining the relative efficiency of illumination in rooms **M spectroscope** A direct-vision spectroscope

martensite A solid solution of 2 % carbon in iron, which is present in quenched steel On slow cooling it decomposes into iron and iron carbide

martial ethiops Magnetic ferric oxide

Martin's flask A culture flask, consisting of a glass bulb with three long necks which can be sealed, used in the manufacture of toxins **M 's centrifuge** A small laboratory centrifuge driven by water power **M 's filter** A Berkefeld filter with a funnel, used for filtering toxins directly into a flask

martite A native ferric oxide (see *hematite*)

Martius yellow The calcium salt of naphthalene yellow

marzipan A mixture of sugar, ground almonds and starch, used for confectionery

mascagnine A mineral ammonium sulfate

mash A warm mixture of malted barley and water used in the brewing industry to prepare wort, q v

masked Hidden or concealed **m element** An element present in an organic compound, but combined in such a manner that its properties are subdued or hidden, so that it does not give the usual reactions, *e g* , iron is masked in hemoglobin, magnesium is masked in chlorophyll **m group** An atomic group present in an organic compound, but combined in such a manner that its usual properties are subdued **m radical** M group

masonite Gun fiber A wood fiber used as a constructional and insulating material **m process** Chips of wood are placed in autoclaves (guns) and subjected to steam of 1000 pds pressure per in ² for five seconds, the sudden release explodes the chips

mass (1) M A definite quantity of matter (q v) which offers resistance to change of motion It is the physical quantity of an electron, atom, molecule, or an assembly of these, *e g* , mole The unit is the milligram, gram, or kilogram Mass is an unchangeable quality of matter, *e g* , one gram of water always contains a definite number of molecules Weight is a changeable property of matter as it is influenced by location on the earth surface, and a gram-weight of water at sea level contains less molecules than a gram-weight at the top of a mountain **active-** The number of moles (gram-molecules) in unit volume (1 liter) Cf *atomic mass* (2) In pharmacy a homogeneous solid or semi-solid mixture, as, **blue-** A preparation of fine metallic mercury, suspended in honey or syrup **copaiva-** Copaiva solidified with magnesium oxide **ferrous carbonate-** Vallet's mass A paste containing 33 % ferrous carbonate, used as a hematinic **mercury-** Blue mass **Vallet's-** Ferrous carbonate mass

MAGNITUDES OF MASS

Einstein universe		8×10^{78} gm
Galaxy (Milky Way system)		$2\ 3 \times 10^{55}$
Large stars		1×10^{36} "
Sun	331,950 × earth	$1\ 99 \times 10^{33}$ "
Small star		1×10^{32} "
Jupiter	317 × earth	$1\ 9 \times 10^{29}$ "
Earth	1 0 earth	$5\ 99 \times 10^{26}$ "
Mercury	1/25 × earth	$2\ 5 \times 10^{25}$ "
Moon	1/81 56 × earth	$7\ 5 \times 10^{24}$
Hydrosphere	1,335,000,000,000 Mill tons	$1\ 3 \times 10^{24}$ "
Atmosphere	5,633,000,000 " "	$5\ 6 \times 10^{21}$ "
Average steroid	1,000,000,000	1×10^{21}
Steamship Queen Mary	72,000 tons	$7\ 2 \times 10^{10}$
Meteorites, annual fall	40,000 "	4×10^{10} "
1 ton =	1000 kg (2205 pounds)	1×10^{6} "
Man, average weight 76 kg (166 pds)		$7\ 5 \times 10^{4}$ "
1 kilogram (kg)	= 1000 gm (2 2 pds)	1×10^{3} "
1 gram (gm)	= 1000 mg (15 4 grs)	1 "
1 milligram (mg)	= 1000 μg	1×10^{-3} "
1 microgram (μg)	= 1000 γ	1×10^{-6} "
1 gamma (γ)	= 0 000,000,001 gm	1×10^{-9} "
Vitamin A, effective dose 3 γ		3×10^{-9} "
Magnesium by chemical test 2 γ		2×10^{-9} "
Microbalance sensitivity 0 4 γ		4×10^{-10} "
Sodium by flame test 0 07 γ		7×10^{-11} "
Mercaptan by odor 0 002 γ		2×10^{-12} "
Gold particle	(0 000,01 cc cube)	2×10^{-14} "
Colloid particle	(0 000,000,5 cc cube)	2×10^{-18} "
Protein molecule 100,000 × H		1×10^{-18} "
Maltoseazone molecule	4,021 × H	$6\ 7 \times 10^{-21}$ "
Octodecapeptide molecule	2,112 × H	$3\ 5 \times 10^{-21}$ "
Oilfilm (0 000,000,2 cm square)		2×10^{-21} "
Tristearin molecule 890 × H		$1\ 48 \times 10^{-21}$ "
Cane-sugar molecule 342 × H		$5\ 7 \times 10^{-22}$ "
Uranium atom	238 × H	4×10^{-22} "
Water molecule	18 × H	3×10^{-23} "
Hydrogen atom	1 × H	$1\ 663 \times 10^{-24}$ "
Electron	1/1845 of H	$9\ 01 \times 10^{-28}$ "

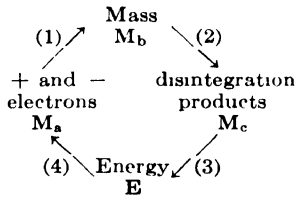
m action A law of chemical reaction In a homogenous system, the product of the molar concentrations of the different participating substances on one side of the equation, when divided by the product of the molar concentrations of the substances on the other side of the equation gives a constant value for each temperature, no matter how great or small the concentration was at the beginning of the reaction It applies to both the direct and reverse reactions (law of Guldberg and Waage) The velocity of a chemical reaction is proportional to the active masses (= molar concentrations) of the reacting substances For instance in the reaction

$$n_1A_1 + n_2A_2 + \quad \rightleftharpoons n_1'A_1' + n_2'A_2' +$$

$$K = \frac{k_1}{k} = \frac{[A_1]^{n_1}[A_2]^{n_2}}{[A_1']^{n_1'}[A_2']^{n_2'}}$$

where K is the dissociation constant, and k and k_1 the constants of proportionality for Guldberg and Waage's Law applied to the direct and reverse equations **m a constant** The constant k in the above formula The equation is applicable to other types of equilibria *e g* ionization etc **m conservation** A law of physics No matter can be destroyed, neither can new matter be created, all changes of matter are simply transformations It is analogous to the law of energy conservation Cf *energy matter* **m energy cycle** The

postulate of a transformation of matter into energy, and vice versa which follows from Einstein's theory



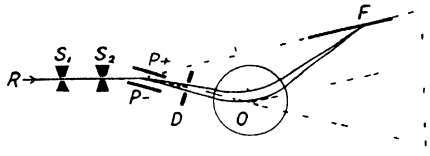
where for each given system $\Sigma M_a > \Sigma M_b > \Sigma M_c$ (degradation of mass) It is based upon

(1) *Atom building* (q v), as in the process $4H \rightarrow He$, or $4 \times 1.00778 \rightarrow 4.00216$ where 0.029 gm per mol disappears and is transformed into $0.029 \times c$ ergs, as $c^2\delta M = \delta E$, where $\Sigma M_a > M_b$

(2) *Atom disintegration* (q v), as exemplified by radioactive elements $\delta E/c^2 = \delta M$, where $M_b > \Sigma M_c$

(3) *Atom annihilation* (q v), as the disappearance of a hydrogen atom when its electron neutralizes its positive charge $H^+ + e = 1.00778c^2$ ergs, the complete transformation, $Mc^2 = E$

(4) *Atom creation* (q v), or the formation of positive and negative electrons by the absorption of energy, $E/c' = M$, which probably occurs in interstellar or intergalactic space Cf *materialization* **m law** (1) Mass conservation (2) Mass action **m number** The isotopic number, applied where the atomic number is not ascertained Cf *isobars* **m spectra** Aston spectra Spectra of isotopes The separation of an element into its isotopes by making it the anode in a vacuum tube with a perforated cathode By passing a current of high voltage through the tube, the canal rays (formed behind the cathode), when exposed to a magnetic field or electric field, are deviated more or less from a straight path



Mass spectra

This deviation is proportional to their mass and can be made visible either by a fluorescent screen or a photographic plate **m spectrogram** The photographic images produced when positive rays, deflected by a magnetic or electric field, fall on a photographic plate **m spectrograph** A device for determining the relative masses of isotopes canal rays, R, pass through slits, S, into the electric field, P^+ and P^-, and diaphragm D, selects a portion of equal velocity which passes over magnetic field, O, which focusses particles of equal mass at F

massecuites A mixture of syrup and crystals of cane sugar, used in the sugar industry

massicot A native lead monoxide, d 9.3, m 600

mastic (1) Mastiche The concrete resinous exudations from *Pistacia lentiscus* in Anacardiaceae of the Mediterranean region A pale yellowish or greenish, transparent resin, insoluble in water, soluble in alcohol Used in lacquers, incense, plasters, dental cements, chewing gum, and medicinally, as a styptic and carminative (2) A mixture of finely-powdered rock and bituminous material, used for highway construction (3) A mortar used for plastering walls, a mixture of finely-ground limestone, sand, litharge, and linseed oil **m oil** An essential oil from m, d 0.858–0.868, b 155–160, containing d-pinene

mastic acids A group of resinous acids obtained from mastic

masticbic acid	$C_{20}H_{30}O_2$ = α-resin
masticin	$C_{20}H_{31}O$ = β-resin
masticinic acid	$C_{23}H_{36}O_4$
masticolic acid	$C_{23}H_{36}O_4$
masticonic acid	$C_{32}H_{48}O_4$

mastication The process of chewing food, in which it is mixed with the salivary enzymes and amylolytic changes begin Cf *digestion*

masticatory An agent to increase the secretion of saliva, *e g*, chewing gum

mastix Mastic (1)

masurium Eka-manganese Ma = 98(?) An element of the manganese family, atomic number 43, discovered (1925) by Noddack from the x-ray spectra of platinum ores gadolinite, and columbite Its existence has been doubted Cf *nipponium*

masut The residue remaining after the distillation of benzine and kerosene from Russian petroleum It contains 87 % C, 12 % H and 1 % O and burns at about 100°C

mat Matte (2)

match A small strip of wood, paper, or wax dipped in a pyrophoric mixture **lucifer-** A m dipped into a paste of scarlet or yellow phosphorus or P_4S_3 gum, red lead and sometimes potassium chlorate, which ignites when rubbed on sand paper **safety-** A m dipped in a mixture of 24 pts antimony sulfide 22 pts potassium chlorate 12 pts potassium dichromate, 22 pts red lead, and gum and coloring pigments It ignites when rubbed on paper coated with red phosphorus glass powder and gum The wood, being impregnated with borax, does not glow

maté Paraguay tea, yerba Jesuit tea Brazil tea yerba mate The dried leaves of *Ilex paraguayensis* an Aquifoliaceae of South America Its infusion is used as a beverage **Zapek-** Maté leaves which have been treated at high temperature

Materia Medica (1) A knowledge of the natural history, physical characters, and chemical properties of drugs (2) Pharmacy (3) Pharmacology (4) Therapeutics

materialization The production of matter, *e g* electrons and positrons, by the transformation of gamma-rays $h\nu = m_{e+} + m_{e-}$ + kinetic energy, where m_{e+} and m_{e-} are the mass of the positron and electron Cf *mass-energy cycle*

matesterin $C_{23}H_{40}O_3$(?) A dihydroxy sterol from maté White needles, m 270

matico The dried leaves of *Piper angustifolium* a Piperaceae Used as fluid extract, as a genito-urinary stimulant **m camphor** $C_{12}H_{16}O$ = 176.1 A terpene from matico **m oil** An essential oil from m, d 0.930–1.130, soluble in alcohol

matildite A silver ore, $AgBiS_2$

matlochite. A native lead chloride and oxide, $PbO.PbCl_2$.

matrass. An obsolete term for a distilling flask.

matricaria. German chamomile. The dried flowerheads of *M. chamomilla*, a Compositae; used as the fluid extract, as a febrifuge and tonic.

matrine. (1) $C_{15}H_{24}ON_2$ = 248.20. Isolupanine. The chief alkaloid of kuh-seng; it occurs in four isomeric forms: α- Needles, m.77. β- Rhombic prisms, m.87. γ- A liquid, d.1.088, b.223. δ- Prisms, m.84. They are all soluble in water, alcohol or chloroform. (2) $C_{15}H_{26}N$ = 220.2. A liquid alkaloid from *Sophora angustifolia*. Cf. *cytisine, sophorine.*

matrix. (1) Ground mass; rock or earth which contains a metallic ore or a mineral. (2) The impression left in a rock by a fossil or crystal. (3) The material surrounding a precious stone. (4) A conventional arrangement of numbers in horizontal rows and vertical columns, the latter being more numerous. It is useful in interpreting quantum numbers. Cf. *Pauli's principle, Stoner quanta.* **m. theory.** The spectral line which corresponds with a transition from one quantum state to another (*e.g.*, 2 to 1; 2 to 3, etc.) is expressed by an amplitude or intensity factor (a) and a frequency or energy factor (e) in terms of the following series:

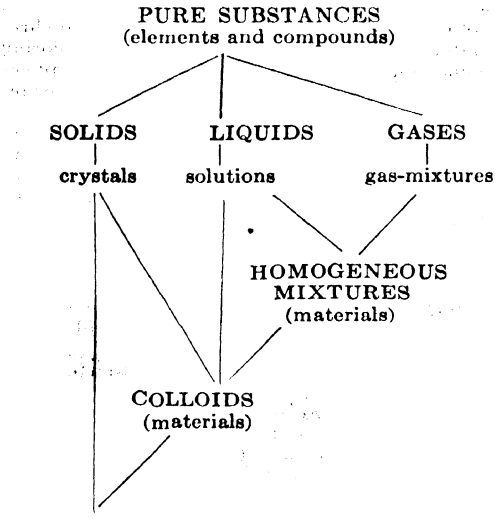
a(11) a(12)e(12) a(13)e(13).....
a(21)e(21) a(22) a(23)e(23).....
a(31)e(31) a(32)e(32) a(33).....

Cf. *quantum theory.*

matt salt. Acid ammonium fluoride.

matte. (1) The crude metal obtained by smelting sulfide ores, which still contains some sulfur. (2) A roughened surface which diffuses light. Antonym—glossy.

matter. Any body, substance or particle which is subject to gravitation; hence any substance, either solid, liquid or gaseous, which occupies space. Cf. *mass.* Classification:



annihilation of- The theory that i destroyed in the interior of a star by the transformation of mass into radiations; cf. *energy, mass-energy cycle.* **conservation of-** See *mass conservation.* **creation of-** The assumption that the diffuse gaseous nebulosities absorb radiations and transform it into matter; cf. *energy, mass-energy cycle.* **destruction of-** See *annihilation of-* and *disintegration of-.* **disintegration of-** The radioactive transformations by which matter of one kind is transformed into matter of another kind with the partial liberation of energy. Cf. *packing effect, radioactivity.* **transformation of-** Chemical changes, reactions.

Matthiessen's rule. The product of specific resistance and mean temperature coefficient of resistance is constant.

Maumené, Edme Jules. 1818–1891. A French chemist. **M. number.** The rise in temperature occurring in the M. test. **M. test.** A reaction to distinguish between drying and non-drying oils. 50 gm. of oil are added to 10 cc. of conc. H_2SO_4; if the rise in temperature succeeds 70°C, drying oils are present.

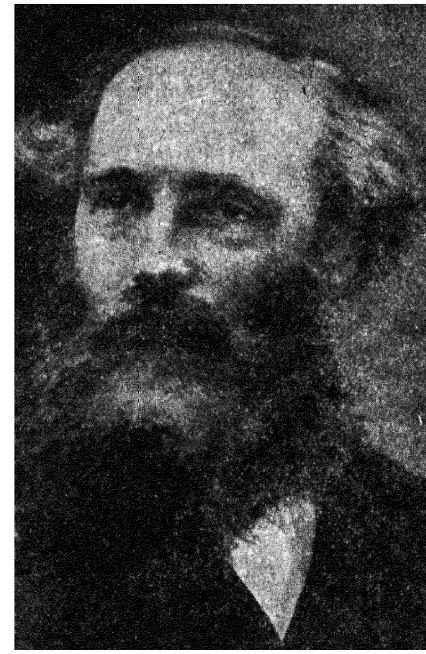
mauvein. $C_{27}H_{24}N_4$ = 404.4. Aniline purple, Perkin's mauve. A violet dye of the phenyl safranine group; the first aniline dye, and prepared by Perkin in 1856.

maximal. The greatest value. **m. work.** The greatest amount of energy obtainable from a process or reaction.

maximum. The largest quantity or value. **m. boiling point mixture.** That mixture of two or more liquids which has the highest boiling point. **m. temperature.** The temperature above which the growth of bacteria does not take place.

maxite. Leadhillite.

maxivalence. The highest valency of an element; it generally corresponds with the group-number in the periodic system.



James Clerk Maxwell.

(From Thomson's "Outline of Science." Courtesy of G. P. Putnam's Sons, N. Y.)

Maxton screen A rotating screen

Maxwell, James Clerk 1831–1879 A Scottish physicist, noted for his electrical and magnetical researches **M demon** A means by which molecules of different velocities may be separated **M law** If μ is the refractive index of a medium, and k the inductivity of a medium $k = \mu^2$, provided the frequencies of the electrical and light vibrations are the same

maxwell A unit of magnetic quantity or flux

1 Internat maxwell = 1 00043 absolute maxwells = 1 line = 10^{-8} volt-seconds

1 Int maxwell per cm ^{2} = 6 452 maxwell per inch

1 absol maxwell = 0 99957 intern maxwell

Absolute dimensions, $L^{\frac{1}{2}}M^{\frac{1}{2}}k^{-\frac{1}{2}}$ *e s u units* or $L^{\frac{3}{2}}M^{\frac{1}{2}}T^{-1}\mu^{\frac{1}{2}}$ *e m u units*

may apple Podophyllum

Mayer, Julius Robert von 1814–1878 A German physician and physicist, who originated the mechanical theory of heat and conservation of energy and matter Cf *Meyer*

mayer My A unit of heat capacity The mayer is the heat capacity of a body which is raised one degree centigrade by one joule The heat capacity of 1 gram water, at 20°C , is 4 18 mayers

Mayer's hemalum A staining solution consisting of 1 gm hematein 50 cc 90 % alcohol 50 gm alum, 0 5 gm thymol and 1000 cc water

Mayer's reagent A solution of 1 35 gm $HgCl_2$ and 5 gm KI in 100 cc water, used as a reagent for alkaloids with which it gives a white precipitate

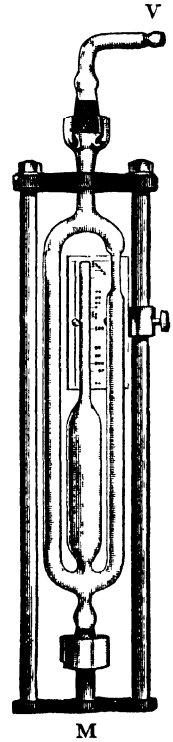
maysin A globulin in corn meal (0 25 %) which coagulates at 70°C

Mayow, John 1643-1679 An English chemist who discovered that the atmosphere consists of two gases, one supporting life and combustion, and indicated their origin

McBain, James William 1882– A Canadian-born, American physical chemist **McBain-Baker balance** A silica spring-balance enclosed in heavy glass tubing for the study of sorption at different pressures **McB centrifuge** An ultracentrifuge (q v) consisting of a spinning top driven by and floating on air

McLaurin process A low-temperature carbonization method for coal

McLeod gauge A device for measuring low gas pressures (0 2 to 0 0005 mm) in a high vacuum system by trapping a known volume of gas and compressing it to a measurable pressure Cf *MacLeod*



McLeod gauge

showing measuring head connected at M to barometric mercury column, and at V to high vacuum pump

McPherson, William 1864– An American chemist noted for research on organic compounds

Me Abbreviation for methyl, CH_3—

mead Hydromel

meadol Trade name for a lignin plastic prepared from soda wood black liquors

meadow anemone Pulsatilla **m crocus** Colchicum **m lily** The bulb of *Silium candidum*, a Liliaceae, used as mucilaginous emulsion **m sweet** Queen-of-the-meadow The herb of *Spiraea ulmaria*, a Rosaceae, used as an aromatic and diuretic **m saffron** Colchicum

mean An average **arithmetic-** The quotient obtained by dividing the sum of n numbers by n, hence $\frac{a+b+c+d}{4}$ = arithmetical mean of a, b, c and d **geometric-** The nth root of n numbers multiplied by each other, hence, $\sqrt[4]{abcd}$ = geometrical mean of these 4 numbers **harmonic-** The quotient obtained by dividing n by the sum of 1/n numbers, or $\frac{4}{\frac{1}{a}+\frac{1}{b}+\frac{1}{c}+\frac{1}{d}}$ = harmonic mean of these 4 numbers **proportional-** The quotient obtained by dividing ma + nb + oc by (m + n + o), thus the atomic weight is the p mean of the isotopic weights (multiplied by the percentages present) **quadratic-** The square root of the quotient obtained by dividing the sum of n^2 numbers by the number of added numbers, as, $\sqrt{\frac{a^2+b^2+c^2+d^2}{4}}$ = quadratic mean of the 4 numbers A comparison of the different means shows that their numerical value is in the following order quadratic (highest value), arithmetic geometric, harmonic (lowest value) **m path** The mean free path of molecules is the average distance which they are supposed to travel without collision **m refractive index** The average refractive index of a substance for the extreme red and extreme violet rays

means The second and third term in the mathematical expression a b c d where b and c are the means, a and d the extremes $\frac{a}{b}=\frac{c}{d}$ The rule 'Multiply the means and divide by the extremes," enables any unknown value to be obtained if three values are known, thus $a=\frac{bc}{d}$, $b=\frac{ad}{c}$, $c=\frac{ad}{b}$, and $d=\frac{bc}{a}$

measure An appliance with which to determine a physical quantity, generally restricted to those which determine length, diameter volume, and capacity, *e g* , rules, calipers, graduates etc For units of measures, see *metric system*

measuring The determination of a physical quantity

meat The edible portion of animal flesh, excluding fish **m bases** An arbitrary analytical number of meat foodstuffs It is given by the difference (in percentages) [Total nitrogen − insoluble and coagulable nitrogens proteoses, peptones and gelatin] × 3 12 **m extract** A partly-evaporated bouillon, used as nutrient and for culture media **m meal** A fertilizer consisting of cooked, dried and powdered meat, with little bone It contains 10–11 5 % nitrogen and 1–5 % P_2O_5 **m sugar** Inositol

Mecca balsam Balm of Gilead

mechanical Pertaining to the physical forces of masses and their control, *e g* , levers, gravita-

tion, hydraulic, and gaseous pressures **m analysis** Analysis by mechanical as distinct from physical or chemical means, *e g*, sifting, sedimentation **m antidote** The use of the stomach-tube or -pump to remove a poison from an organ **m equivalent** Joule The quantity of energy which, transformed into heat, yields 1 calorie of heat = $4\ 8 \times 10^7$ ergs (at 20°C) **m pulp** A pulp obtained by the wet grinding of wood and used in the manufacture of low grades of paper

mechanics A branch of physics dealing with those actions of forces or bodies (solid, liquid, or gaseous) which involve no change in state or composition *e g*, machines (levers, wheels screws), hydraulics, and pneumatics **quantum-** See *quantum theory* **wave-** See *wave mechanics*

mechanism A machine or instrument which transforms or transmits mechanical force

mecholyl Acetyl β-methyl choline

mecocyanin $C_{27}H_{30}O_{16}$ = 610 23 An anthocyanin from the poppy

meconate A salt of meconic acid, containing the bivalent $C_5H_2O_3(COO)_2$ = radical

meconic acid $C_7H_4O_7,3H_2O$ = 254 12 Hydroxypyrocomane dicarboxylic acid A dibasic hydroxy acid, from opium White crystals soluble in water or alcohol Cf *comenic acid*

meconidin $C_{21}H_{23}NO_4$ = 353 19 Yellow amorphous powder, m 58 insoluble in water

meconin $C_{10}H_{10}O_4$ = 194 1 Opianyl, 5 6-dimethoxyphthalide The lactone of meconinic acid, derived from opium Colorless crystals, m 102, slightly soluble in water, soluble in alcohol or ether

meconinic acid $C_{10}H_{12}O_5$ = 212 1 $C_6H_2(OMe)_2(CH_2OH)COOH$, 1 2-methoxy-3-carboxyl-4-methanol-benzene It exists only in salts, and as its lactone, meconine

media The plural of *medium*

median See *frequency*

medical Pertaining to the diagnosis and treatment of disease **m jurisprudence** Legal *medicine*

medicinally Pertaining to a remedy used in the treatment of disease

medicine (1) The science and art of healing (2) A drug or substance administered to the body to correct a disturbance of its normal function **clinical-** The study of disease by laboratory methods **forensic-** Legal medicine **legal-** The study of disease applied to the detection of crime **patent-** A medicine or drug protected by letters of patent **preventive-** A branch of medical knowledge, which aims to prevent disease **veterinary-** The application of medical knowledge in the treatment of diseases of animals

medinal A proprietary brand of *barbital sodium*

medium (1) A substance which acts as the transmitter of a force (2) See *culture* medium (3) An average or mean

meerschaum $H_2Mg_2(SiO_3)_3,H_2O$ Sepiolite A common porous rock-forming magnesium silicate, d 2

mega- (1) A prefix derived from the Greek term for large (2) One million times

megabar A unit of pressure 1 megabar = 1,000,000 bars = 0 987 atm It is equivalent to the pressure of one megadyne per square centimeter (Sometimes used erroneously for millibar)

megabarye Megabar

megadyne A unit of work 1 megadyne = 1,000,000 dynes (about 1 kg)

megaerg A unit of force 1 megaerg = 1,000 000 ergs

megafarad Macrofarad A unit of electrical quantity 1 megafarad = 1,000,000 farads

megameter A unit of length 1 megameter = 1,000,000 meters

megarrhizin A glucoside from the root of *Megarrhiza californica*, a Cucurbitaceae

megavolt A unit of electrical potential 1 megavolt = 1,000,000 volts

meiler A pit or heap of wood covered with soil for the manufacture of charcoal

meionite A vitreous white to colorless, translucent to transparent native calcium aluminum silicate

Meissner, Paul Traugott 1778–1850 An Austrian pharmaceutical chemist, noted for his *Handbuch*

MEK A technical abbreviation for methyl ethyl ketone

Mekker burner A modified bunsen burner containing, in its enlarged opening, a metal screen in which the gas and air are more intimately mixed than usual and thus produce a high temperature (about 1700°C at the center of the cone)

mekonine Meconin

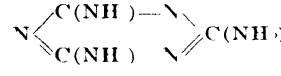
mel Honey The saccharine substance deposited by the honey bee *Apis mellifera* rich in fructose Cf *nectar ceromel hydromel oxymel*

melaconite A native black copper oxide CuO

melamac Trade name for a melamine-formaldehyde plastic

melam $C_6H_9N_{11}$ = 235 21 A white powder obtained by heating ammonium thiocyanate, insoluble in water See *albene melem*

melamine $C_3N_3(NH_2)_3$ = 126 7 Cyanurotriamide, cyanuramide 2 4 6-triamino-*s*-triazine The amide of cyanuric acid



Transparent colorless crystals, d 1 573 m below 250 soluble in water

melampyrine Dulcitol

melampyrite Dulcitol

melan A dark brown oily fluid expressed from *Melilotus coeruleus* a Leguminosae, used externally on burns and ulcers

melaniline Diphenylguanidine

melanine $C_{17}H_{28}O_{21}N_{14}S$ = 1779 2 A black coloring matter (chromoprotein) obtained from various insects hairs of animals, and dark skins, soluble only in alkali and is formed by oxidation of the tyrosine ring of white protein Cf *tyrosinase*

melanite A black variety of andradite See iron *garnet*

melanterite A native ferrous sulfate, $FeSO_4 \cdot 7H_2O$

melanuric acid See *isocyanurimide*

malasol An emulsion of titrol used as an antiseptic

meldola blue New blue Naphthol blue A blue aniline dye of the methylene blue type

melee A diamond weighing less than a quarter carat, used for glass cutting

melem $C_6H_6N_{10}$ = 218 2 An amide of cyanuric acid, obtained with melam by heating ammonium thiocyanate

melene $C_{30}H_{60}$ = 420 6 Triacontylene An unsaturated hydrocarbon from bees-wax A colorless fatty mass d 0 89 m 62 b 375 insoluble in water, soluble in hot alcohol or ether

meletin Quercetin

melezitose $C_{18}H_{32}O_{16}$ = 504 3 Melicitose, melhzitose A trisaccharide obtained from manna and from the sap of conifers and poplars, which hydrolyzes to glucose and turanose (glucose-fructose) Cf *melizitose*

melibiase An enzyme in bottom- but not top-yeasts, which ferments raffinose

melibiose $C_{12}H_{22}O_{11}$ = 342 17 Glucose-α-galactoside A disaccharide [α]D + 143°, obtained from Australian manna, yellow mallow, and by hydrolysis of raffinose

melicitose Melezitose

meligrin A condensation-product of dimethyl oxyquinine and methylphenylacetamide, used medicinally in neuralgia

melilite (1) A group of anhydrous calcium aluminum silicates in igneous rocks (2) The mineral (Al, Fe) (Ca, Mg)$_3$Si$_2$O$_{10}$

melilith $Ca_4Si_3O_{10}$ A melilite

melilot Melilotus sweet yellow clover The dried leaves and flowering tops of *Melilotus officinalis*, a Leguminosae, which contains coumarin coumaric and melilotic acid, used as a mild anodyne

melilotic acid $C_9H_{10}O_3$ = 166 08 o-hydrocoumaric acid, oxyhydrocinnamic acid β-phenolpropionic acid An aromatic, hydroxy acid obtained from the Melilotus species Colorless crystals, m 81, on heating further it forms a lactone **m lactone** $C_9H_8O_2$ = 148 06 m 25

melinite A high explosive of the lyddite type

melissa The dried leaves and tops of balm, *Melissa officinalis*, a Labiatae used as carminative and febrifuge **m oil** Verbena oil **East Indian-** Lemongrass oil

melissic acid $C_{30}H_{60}O_2$ = 452 6 A monobasic, fatty acid beeswax Colorless scales, m 90, insoluble in water soluble in alcohol or ether **m alcohol** Myricyl alcohol **m palmitate** Myricin

Melissos of Samos 470–410 B C A Greek philosopher famous for the statement "Nothing can come from nothing"

melissyl alcohol $C_{30}H_{62}O$ = 438 65 Colorless crystals m 88

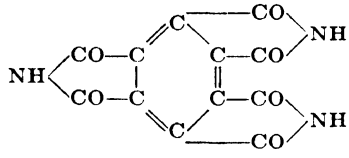
melitic Mellitic

melitose $C_{12}H_{22}O_{11}$ = 342 2 A disaccharide from Australian manna

melitriose Raffinose

melizitose A sugar from *Alhagi maurorum* a Leguminosae, yielding manna Cf *melezitose*

mellimide $C_{12}H_3O_6N_3$ = 327 08 Paraimide



mellisic Melissic

mellite (1) In pharmacy, any medicated honey (2) In mineralogy *honeystone*

mellitene $C_{12}H_{18}$ = 162 1 Hexamethylbenzene C_6Me_6 Colorless scales, m 164 insoluble in water

mellitic acid $C_{12}H_6O_{12}$ = 342 1 Hexacarboxyl-benzene, benzene hexacarboxylic acid, $C_6(COOH)_6$ Colorless needles, m 287 soluble in water or alcohol Its aluminum salt occurs in peat as honeystone **m imide** Euchroic acid

mellityl alcohol $C_{11}H_{16}O$ = 164 12 Tetramethylphenyl metanol $C_6HMe_4CH_2OH$

mellon(e) C_9H_{13} = 121 1 A hydrocarbon obtained in addition to melam and melem by igniting mercuric thiocyanate See *Pharaoh's serpents*

mellophanic acid $C_{10}H_6O_8$ = 254 05 Benzene-1 2 3 5-tetracarboxylic acid q v Colorless crystals, m 238 Cf *prehnitic* and *pyromellitic acid*, *mallophene*

Mellor, Joseph William 1869–1938 An English chemist, noted for his handbook of inorganic chemistry

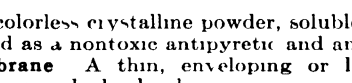
mellorite A complex lime-ferric oxide silicate of the garnet type

Mellot's metal D'Arcet metal

melonite (1) $NiTe_2$ Tellurnickel A native nickel-telluride, reddish granular particles (2) A silica mineral of the scapolite group, $Ca_4Al_6Si_6O_{25}$

melting Fusing The transformation of a solid to a liquid by means of heat **m furnace** A furnace used for fusing, as a glassmaker's furnace **m point** The temperature at which a solid changes to a liquid or at which liquid and solid phase are in equilibrium under a pressure of 1 atmosphere The highest known m p is 4200°C for a mixture of 25 % HfC and 75 % TaC, and 3887°C for HfC The lowest m p that of helium **m point tube** A capillary tube used to determine the melting point of the substance which is contained in it, by attaching it to a thermometer and heating it in a liquid until the contents fuse Cf *Thiele tube*

melubrin $C_{12}H_{14}O_4N_2SNa$ = 305 2 Sodium-1-phenyl-2 3-dimethyl pyrazolone sulfonate



A colorless crystalline powder, soluble in water, used as a nontoxic antipyretic and analgesic

membrane A thin, enveloping or lining substance, which divides a space or an organ **animal-** A skin-like tissue obtained from animal tissues (parchment), used for dialyzing **semi-permeable-** A tissue which permits the passage of certain substances (*e g* water or crystalloids), but prevents the passage of others (*e g*, colloids) Classification

(1) *sieves*, as such, or coarse filterpaper
(2) *cell filters*, such as very fine filterpaper
(3) *bacterial filters*, such as kieselguhr
(4) *colloidal filters*, such as parchment or collodion
(5) *molecular sieves*, such as copper ferrocyanide

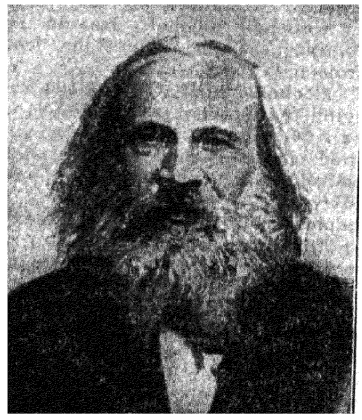
menachanite Menaccanite, menacanite menakanite, menacconite A titaniferous magnetic oxide of iron from Menachan, in Cornwall Cf *ilmenite*

menadione 2-Methyl naphthoquinone

menaphthyl The monovalent methyl naphthyl radical, $C_{10}H_7CH_2$—

Mendelyeev, Dmitri Ivanovitch Mendeleeff Mendelejeff 1834–1907 A Russian chemist

noted as one of the discoverers of the periodic law (see *Meyer*, Lothar), and predictor of several *eka* elements. **M.** chart. Periodic



Dmitri Ivanovitch Mendelyeev.

(From McPherson & Henderson's "First Course in Chemistry." Courtesy of Ginn & Co.)

table. **M. group.** A vertical group of the periodic table. **M. law.** Periodic law. **M. system.** Periodic system.

MENDELYEEV'S PERIODIC TABLE

Series	Period	0	I R_2O	II RO	III R_2O_3	IV RO_2 RH_4	V R_2O_5 RH_3	VI RO_3 RH_2	VII R_2O_7 RH	VIII
1			H							
2	1	He	Li	Be	B	C	N	O	F	
3	2	Ne	Na	Mg	Al	Si	P	S	Cl	
4	3	A	K	Ca	Sc	Ti	V	Cr	Mn	Fe Co Ni
5			Cu	Zn	Ga	Ge	As	Se	Br	
6	4	Kr	Rb	Sr	Y	Zr	Cb	Mo	Ma	Ru Rh Pd
7			Ag	Cd	In	Sn	Sb	Te	I	
8	5	Xe	Cs	Ba	La	Ce				
9					Rare Earths					
10	6					Hf	Ta	W	Re	Os Ir Pt
11			Au	Hg	Tl	Pb	Bi	Po	El	
12	7	Rn	Ve	Ra	Ac	Th	Pa	U		

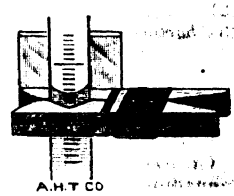
mendozite. A massive, white, fibrous, sodium-aluminum sulfate, or sodium alum.

meneghinite. A native, lead-antimony sulfide, $4Pb_2SbS_2$.

menformon. Theelin.

menhaden. The fish *Brenvoortia tyranniss*, used for making oil and fertilizer.

meniscus. The crescent-shaped surface of a liquid in a tube, either concave (when the liquid wets the material of the container, as water and glass), or convex (when liquid does not wet, as mercury and glass). **m. reader.** (1) A colored



Meniscus reader.

of the liquid to be read more exactly. It is customary to read the lowest point of the meniscus. (2) A clamp and card attached to the buret.

Menispermaceae. Moonseed family, a group of woody, climbing tropical plants:

Anamirta paniculata	cocculus indicus
Cisampelos pereira	cisampeline
Jateorhiza palmata (calumba)	calumba
Chondodendron tomentosum	pareira
Menispermum canadense	menispermum

Cf. *cucoline, deyamittin, diversine, sinomenine.*

menispermine. $C_{18}H_{24}N_2O_2$ = 300.3. An alkaloid from *Cocculus indicus*, (*Anamirta paniculata*) and *Menispermum canadense;* colorless crystals.

menispermoid. The combined principles from *Menispermum canadense;* used in medicine.

menispermum. Yellow parilla or moonseed. The dried roots of *Menispermum canadense.* Used as the fluid extract, similarly to sarsaparilla.

menstruum. A solvent used for the extraction of drugs.

mensuration. The act of measuring. **m. formula.** (pl. **-ae, -as**). The mathematical equations by which plain, cubical, or spherical figures or bodies are measured.

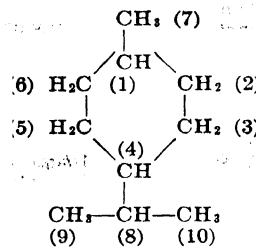
mentha. (1) Mint (*e.g.*, peppermint). (2) A genus of Labiatae.

M. aquatica	marshmint, poco oil
M. crispa	spearmint oil
M. longifola	pennyroyal oil
M. piperita	peppermint oil
M. sativa	marshmint
M. spicata	spearmint
M. sylvestris	English horsemint
M. viridis	spearmint

m. camphor. l-Menthol. **m. viridis.** Spearmint.

menthadiene. A group of terpenes with two double bonds, derived from menthane, *e.g.*, $\Delta^{1.8(9)}$-*m*- or *1.8(9)-m-* Sylvestrene. *1.3-p-α*-Terpinene. *1.4(8)-p-* Terpinolene. *1.5-p-α*-Phellandrene. *1(7)2-p-β*-Phellandrene. *1.8(9)-p-* Limonene. **m. dione.** Thymoquinone. **m. one.** Carvone.

menthane. $C_{10}H_{20}$ = 140.2. Terpane. **4-isopropyl-1-methylcyclohexane**, hexahydrocymene, menthonaphthene. A saturated hydrocarbon and parent substance of many terpenes:



A colorless liquid, d.0.807, b.169, insoluble in water. **amino-** Menthylamine. **dihydroxy-** Terpine. **epoxy-** Cineole. *3-***hydroxy-** Menthol. **m. diol.** Terpinol.

menthanol. A hydroxy derivative of menthane. **2-** Carvomenthol. **3-** Menthol.

menthanone. A keto-derivative of menthane, *e.g.*, **3-** Menthone.

menthe. A peppermint liqueur (Créme de

menthene $C_{10}H_{18}$ = 138 2 Δ^3-menthane A colorless liquid, b 167, d 0 814, insoluble in water **carvo-** Carvomenthane

menthenol A hydroxy-derivative of menthene **3-** Pulegol

menthenone A keto-derivative of menthene, **3-$\Delta^{4(8)}$-** Pulegone, **3-$\Delta^{8(9)}$-** Isopulegone **Δ^1-** Piperitone **Δ^2-** Carvenone

menthol $C_{10}H_{20}O$ = 156 2 Peppermint camphor 3-hydroxymenthane, menthacamphor, 1-methyl-4-isopropyl-3-hydroxy-hexahydrobenzene A d-rotatory terpene alcohol, in many essential oils Colorless crystals, d_{15} 0 890, m 42, b 212, slightly soluble in water, soluble in alcohol or ether Used in perfumery, flavoring extracts, confectionery, and medicinally (externally), for headache, toothache, colds, skin diseases, and internally as an anodyne, anesthetic, and antispasmodic **m salicylate** Salimenthol **m valerate** Validol

menthonaphthene Menthane

menthone $C_{10}H_{18}O$ = 154 2 Δ^3-hydroxymenthene, 3-terpanone A d-rotatory colorless liquid d 0 896 b 207, slightly soluble in water soluble in alcohol or ether **levo-** Apinol

menthyl The monovalent radical, 3-menthanyl $C_{10}H_{19}$—, derived from menthane by replacing the hydrogen of the third carbon atom **m amine** $C_{10}H_{19}NH_2$ = 155 1 3-aminomenthane A colorless liquid, b 205 *carvo-* See *carvomenthylamine* **m borate** $BO_3(C_{10}H_{19})_3$ Estoral Colorless crystals, used in medicine **m camphorate** A white powder insoluble in water, soluble in alcohol or oils, used medicinally in the treatment of tuberculosis

menyanthes Marsh trefoil, buckbean The dried leaves of *Menyanthes trifoliata*, a Gentianaceae Used as an aromatic bitter

menyanthin $C_{33}H_{50}O_{14}$ = 670 4 Celastin A bitter glucoside from the leaves of the buckbean, soluble in water or ether insoluble in alcohol

menyanthol $C_7H_{11}O_2$ = 111 09 A split-product of menyanthin

mephitic An obsolete term for foul, noxious, or poisonous **m air** Black damp, choke damp An obsolete name for carbon dioxide or nitrogen

merbaphen $C_{16}H_{19}N_2O_6ClNaHg$ = 592 1 Novasurol A mercury derivative of barbital, used as a diuretic

mercaptal Thioacetal A compound formed from mercaptans and aldehydes which combine in the presence of hydrochloric acid Thus, in general—

$$R'CHO + 2HSR'' = H_2O + R'CH(SR'')$$

Cf *mercaptol*

mercaptan (1) Ethyl mercaptan (2) A hydrosulfide or compound containing the radical —SH It is indicated by the *prefix* mercapto- and the *suffix* -thiol, thus CH_3SH, methanethiol*, CH_2SH CH_2SH, *1 2*-ethanedithiol*

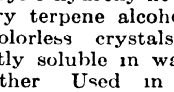
mercaptan acid An organic compound containing the —SH and —COOH radicals, *e g*, HS CH_2 COOH, thioglycollic acid or ethanethiol acid, HS CHMe COOH, thiolactic acid or 1-propanthiol acid

mercaptide Metal mercaptan A metallic derivative of mercaptans, in which the sulfur hydrogen is replaced by a metal, thus, a compound of the general type, R—SM, where R is an aryl or alkyl radical and M, a metal

mercapto- A prefix indicating the presence of a thiol group, —SH *e g*, mercaptothiazole **m sulfothiobiazole** Bismuthiole

mercaptol Mercaptans and ketones combine in the presence of acid to form mercaptols of the general type $R_2C(SR')_2$ Cf *mercaptal*

mercaptophenyl- A prefix indicating the presence of the HS C_6H_4— radical **m dithiodiazolone** $C_8H_6N_2S_3$ = 226 05 White crystals used as a microreagent for bismuth (red precipitate) Cf *bismuthiole*

mercaptothiazole The hypothetical ring compound, 

Mercer, John 1791–1866 An English cotton printer who developed the mercerization process in 1850, this was developed practically in 1889 by Horace Arthur Lowe **M process** Mercerization

mercerization The treatment of cotton with 25 % NaOH, which causes it to shrink and become heavier, stronger, denser and acquire a milky luster, it will not shrink and is more easily dyed

mercerized Treated with caustic soda, see *mercerization*

mercur- A prefix indicating a mercury compound **m ammonium** Mercuriammonium **m diammonium** The bivalent radical $Hg(NH_3)_2$= **m diammonium chloride** $Hg(NH_3Cl)_2$ = 305 9 An infusible, white precipitate obtained from Hg^{++} and Cl^- in the presence of NH_4^+

mercurammonium- A prefix indicating the presence of mercury and ammonia-nitrogen in a compound The usual type have the formula NHg_2X, where X is a halogen, and Hg_2 has replaced the H_4 of ammonium They are yellow or brown solids, insoluble in water, as

m bromide	NHg_2Br
m chloride	NHg_2Cl
m hydroxide	NHg_2OH
m iodide	NHg_2I
m nitrate	NHg_2NO_3

Cf *mercuriammonium*

mercuration Mercurization

mercurial A drug containing mercury **m oil** Grey oil

mercurialine A supposed alkaloid of *Mercurialis annua*, an Euphorbiaceae, probably methylamine

mercurialis The dried herb of *M perennis*, sometimes used medicinally for syphilis

mercuriammonium Mercuric ammonium A double salt of NHg_2X with one or three molecules of NH_4X, as

(a) $NHg_2Cl + NH_4Cl \rightarrow 2HgNH_2Cl$
(b) $NHg_2Cl + 3NH_4Cl \rightarrow 2Hg(NH_2)_3Cl_2$

Cf *mercurammonium*

mercuric A compound of mercury, containing the divalent Hg= atom **m acetate** $Hg(C_2H_3O_2)_2$ = 318 7 White crystals, d 3 25, soluble in water or alcohol used as a reagent medicinally as an antisyphilitic, and as a cosmetic **m acetylide** $3C_2HgH_2O$ = 691 8 A white powder, d 5 3, insoluble in water, and explosive **m amidosuccinate** $Hg(C_4H_7N_2O_3)_2$ Colorless needles, insoluble in water, soluble in acids, used as an antisyphilitic **m aminophenyl arsenate** Mercuric atoxylate

m ammonium chloride $HgNH_2Cl$ = 251 8 Mercuriammonium chloride white precipitate, ammoniated mercury White powder, insoluble in water, soluble in ammonium carbonate solutions, is used medicinally as an antiseptic and alterant **m ammonium propionate** $Hg(NH_2C_3H_4O_2)_2$ = 288 6 Mercuriammonium propionate White needles, soluble in water, used medicinally as an antisyphilitic **m anilinate** $Hg(C_6H_4NH_2)_2$ = 384 3 A white, microcrystalline powder, insoluble in water, used as an antisyphilitic **m arsenate** $Hg_3(AsO_4)_2$ = 879 7 A yellow powder, insoluble in water, soluble in acids, used as an antisyphilitic **m atoxylate** $C_{12}H_{14}O_6N_2As_2Hg$ Mercuric-p-amino-phenylarsonate, asiphyl, aspirochyl, atoxyl mercury A white powder, insoluble in water, used as an antisyphilitic **m benzoate** $Hg(C_7H_5O_2)_2\,2H_2O$ = 478 6 Colorless crystals, insoluble in water, slightly soluble in alcohol, soluble in sodium chloride or ammonium benzoate solution Used medicinally as an antisyphilitic and in skin diseases **m bichromate** $HgCr_2O_7$ = 416 5 A red, crystalline powder, insoluble in water **m borate** M pyroborate **m bromide** $HgBr_2$ = 360 4 Mercury dibromide Colorless, rhombic crystals, d 5 74, m 235, b 319, slightly soluble in water soluble in alcohol or ether, used as an antisyphilitic **m cacodylate** $Hg(Me_2AsO_2)_2$ Mercuric methyl arsenate A white, crystalline powder, soluble in water, used in ampule medication **m carbolate** M phenolate **m carbonate** $HgCO_3$ = 260 3 A white powder, insoluble in water Known chiefly as its basic salts, $HgCO_3\,2HgO$, and $HgCO_3 3HgO$ **m chloride** $HgCl_2$ = 271 5 Corrosive sublimate, sublimate corrosive mercury chloride, mercury bichloride White rhombic crystals which are extremely poisonous (antidote 10 % sodium thiosulfate solution), d 5 43 m 287, b 305 Soluble in water, alcohol, or ether Used for the preservation of wood and museum specimens, as an insecticide and exterminator of rodents and other animals, in tanning embalming, purification of gold, photography textile printing, etching of steel and iron as a mordant and in dyeing furs, also medicinally, as an antiseptic and caustic, and chemically, as a reagent **m chloro-iodide** $HgCl_2\,HgI_2$ = 725 8 A red crystalline powder, soluble in alcohol, used as an antisyphilitic **m chromate** $HgCrO_4$ = 316 4 A yellow, crystalline powder, insoluble in water **m cyanide** $Hg(CN)_2$ = 252 6 Colorless, tetragonal crystals d 4 02 decomp by heat, slightly soluble in water or alcohol Used in photography and in manufacturing cyanogen medicinally as an antiseptic, antisyphilitic, and tonic, usually as ampoules, chemically as a reagent for palladium **m diiodosalicylate** $Hg(C_7H_3I_2O_3)_2$ A yellow amorphous powder insoluble in water soluble in alcohol **m ethylchloride** Colorless, lustrous scales, slowly soluble in water or alcohol, used medicinally as an antisyphilitic **m ferrocyanide** $Hg_2Fe(CN)_6$ = 612 8 A brown powder, insoluble in water or alcohol **m fluosilicate** $HgSiF_6\,6H_2O$ = 450 76 Rhombohedral crystals **m fulminate** $Hg(ONC)_2\,\frac{1}{2}H_2O$ = 293 6 Colorless, rhombic crystals which explode on detonating or at 175°C, slightly soluble in water or alcohol, used as a detonator **m gallate** $[C_6H_2(OH)_3COO]_2Hg$ A greenish-black powder insoluble in water, used as an antisyphilitic **m halides** The divalent halogen compounds of mercury, HgX_2 *alkyl-* A group of organic compounds of the type, RHgX, where R is an aliphatic or alkyl radical *aryl-* A group of organic compounds of the type, RHgX, where R is an aryl or aromatic radical **m hydroxide** $Hg(OH)_2$ = 234 6 White amorphous powder, insoluble in water **m hydroxides** A group of organic compounds of the type, RHgOH **m iodate** $Hg(IO_3)_2$ = 550 4 A white amorphous powder, insoluble in water soluble in sodium chloride or potassium iodide solutions **m iodide** HgI_2 = 454 4 *red-* Mercury biniodide Red, tetragonal crystals, d 6 25, m 241, b 349, insoluble in water, soluble in alcohol or potassium iodide solution Used medicinally as an alterative antiseptic and germicide, and as an antisyphilitic in form of tablets, granules, and ampoules *yellow-* Yellow rhombic crystalline powder, d 6 0, m 241, b 349, insoluble in water, soluble in iodide solutions **m lactate** $Hg(C_3H_5O_3)_2$ = 378 4 A white, crystalline powder, slightly soluble in water used as an antisyphilitic **m lithium iodide** $HgI_2\,2LiI$ = 722 4 Mercuricide A yellow powder, soluble in water or alcohol, used as an antisyphilitic **m naphtholate** $Hg(C_{10}H_7O)_2$ = 486 6 β-naphtholmercury, mercury naphthol A lemon-yellow powder, insoluble in water used as an antiseptic **m nitrate** $Hg(NO_3)_2$ = 324 6 A white, hygroscopic powder, decomp by heat soluble in water, m 79 Used as a reagent and medicinally, as an antisyphilitic *basic-* (1) $2Hg(NO_3)_2\,2H_2O$ = 685 29 Deliquescent colorless crystals (2) $2Hg(OH)NO_3\,H_2O$ = 577 27 (3) $Hg(NO_3)_2HgO\,H_2O$ = 775 87 A white, unstable powder **m oleate** $Hg(C_{18}H_{33}O_2)_2$ = 763 0 A yellowish or red liquid, a solution of mercuric oxide in oleic acid, insoluble in water, soluble in alcohol or ether Used medicinally as an antiseptic and antisyphilitic **m oxalate** HgC_2O_4 = 288 61 White powder insoluble in water **m oxide** HgO = 216 6 *red-* Hydrargyri oxydum rubrum red mercury oxide Red, monoclinic prisms, d 11 14, decomp by heat insoluble in water, soluble in acids Used in the manufacture of mercury salts for paints and pigments for ship keels, in ceramics, medicinally as a stimulant, caustic and parasiticide *yellow-* Hydrargyri oxydum flavum, yellow precipitate Orange-yellow, tetragonal crystals or amorphous powder, insoluble in water, soluble in acids, used medicinally in ointments as a parasiticide **m oxycyanide** $HgO\,Hg(CN)_2$ = 469 2 A white, crystalline powder soluble in water, used as an antiseptic **m phenolate** $Hg(C_6H_5O)_2$ = 386 7 Mercury phenolate m carbolate, phenol mercury A gray to pink powder, insoluble in water, soluble in alcohol or ether, used medicinally as an antiseptic and antisyphilitic **m phenylacetate** $HgC_6H_5C_2H_3O_2$ = 336 7 Colorless prisms, m 149, soluble in alcohol or benzene **m phosphate** $Hg_3(PO_4)_2$ = 791 9 A white powder, insoluble in water *acid-* $HgHPO_4$ = 296 3 A white or slightly yellow powder, insoluble in water, soluble in acids used medicinally as an antisyphilitic **m potassium cyanide** $HgK(CN)_3$ = 317 7 Potassium mercury cyanide Colorless crystals, soluble in water or alcohol used technically, in the manufacture of mirrors and medicinally, as an antiseptic **m potassium**

iodide $HgI_2 2KI = 786\ 5$ Mayer's reagent Yellow, deliquescent crystals, soluble in water, used as a reagent for alkaloids Cf *Toulet's* solution **m potassium thiosulfate** $3Hg(S_2O_3)_2 5K_2S_2O_3$ Mercury and potassium thiosulfate Colorless crystals, soluble in water used as an antisyphilitic **m pyroborate** $HgB_4O_7 = 355\ 9$ Mercuric tetraborate A brown amorphous powder, insoluble in water **m rhodanate** Mercuric thiocyanate **m salicylate** $Hg(C_7H_5O_3)_2 = 474\ 6$ A white powder, insoluble in water, soluble in alkalis or salt solutions, used medicinally as an antiseptic, antisyphilitic, and alterant **m santonate** $Hg(C_{15}H_{19}O_4) = 463\ 5$ A colorless powder, used in medicine **m silicofluoride** $Hg_2SiF_6 2H_2O = 579\ 3$ Prismatic crystals, soluble in water, used as a wound antiseptic **m stearate** $Hg(C_{18}H_{35}O_2)_2 = 767\ 0$ Yellow, granular powder slightly soluble in alcohol, soluble in fats and oils, used medicinally in ointments **m subsulfate** $HgSO_4 2HgO = 729\ 9$ Basic mercuric sulfate, turpeth mineral, Queen's yellow A lemon-yellow, heavy powder, insoluble in water, soluble in acids **m succinate** $Hg(C_4H_4O_4) = 316\ 6$ Colorless crystals, insoluble in water, soluble in salt solutions *imido-* M succinimide **m succinimide** $Hg[C_2H_4(CO)_2N]_2 = 372\ 5$ M imido-succinate A white crystalline powder, soluble in water, used as an antiseptic and antisyphilitic **m sulfate** $HgSO_4 = 296\ 7$ Mercury bisulfate mercury persulfate A white or yellow powder, d 6 47, decomp by heat, slightly soluble in water Used in the manufacture of calomel, in the extraction of gold and silver, in electric batteries, and medicinally, as an antisyphilitic *basic-* M subsulfate *hydrous-* (a) $HgSO_4 2H_2O = 332\ 71$ (Erroneously called "basic") Yellowish crystals, d 6 44, slightly soluble in water, used similarly to the anhydrous salt (b) $3HgO SO_3 4H_2O = 962\ 10$ A yellow powder **m sulfide** $HgS = 232\ 7$ *black-* Black mercury sulfide, metacinnabarite Amorphous, black powder, d 7 7, insoluble in water or alcohol soluble in sulfide solutions, used as a pigment *red-* Red mercury sulfide artificial cinnabar vermilion cinnabar Rhombohedric, scarlet red, crystalline powder, d 8 09, subliming at 446°C, insoluble in water or alcohol, used technically as a pigment and for fumigation **m sulfite** $HgSO_3 = 280\ 6$ A white powder which becomes pink with age, slightly soluble in water **m sulfocyanide, m thiocyanate** $Hg(CNS)_2 = 316\ 6$ M rhodanate, m rhodanide m sulfocyanate A white powder usually pressed into sticks, decomp by heat When ignited it glows and forms a voluminous, cohesive and light ash (Pharaoh's serpent q v), insoluble in water or alcohol, soluble in chloride or cyanide solutions, used in photography **m urate** $HgC_5H_2O_3N_4 = 366\ 6$ A yellowish powder, insoluble in water **m xanthates** A group of organic compounds of the type, R HgS CS OR, in which R is either an aliphatic or aromatic radical

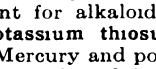
mercuricide Mercuric lithium iodide

mercurides An organic compound of divalent mercury, R_2Hg, where R is a hydrocarbon radical See *mercury methide*, and *ethide*

mercurification Amalgamation Cf *mercurization*

mercurify Amalgamate

mercurimetry The determination of a substance by precipitating it with a mercury salt and determining the mercury in the precipitate

mercurindene $C_8H_6Hg = 302\ 6$ The ring-system, 

mercurio-vegetal Manaca

mercurius Mercury **m praecipitatus** The "red precipitate" (HgO) of the Latin alchemist Geber **m vitae** Antimony oxychloride

mercurization The addition of mercury to an organic compound

mercuroammonium Mercurous ammonium A double salt of the type $HgNH_3X$ **m chloride** $HgNH_3Cl$, a black powder

mercurochrome $C_{20}H_8O_6Na_2Br_2Hg$ Disodium-dibromo-hydroxy-mercury-fluorescein An iridescent green, crystalline powder soluble in water producing a deep red color Its 2 % solution is used as a germicide and genito-urinary antiseptic and as a less irritating household antiseptic than tincture of iodine Cf *apagallin*

mercurol Mercury nucleinate A compound of mercury and nucleic acid made from yeast (20 % Hg) A brownish-white powder, soluble in water, insoluble in alcohol, used medicinally as an astringent antisyphilitic and antipyretic

mercurophen Sodium hydroxy mercury-o-nitrophenolate A brick red powder, soluble in water, used as germicide

mercurous A compound of monovalent mercury, Hg— usually represented as $Hg X_2$ where X is a monovalent acid radical **m acetate** $HgC H_3O_2 = 259\ 6$ Colorless crystalline powder, slightly soluble in water, used medicinally as an antisyphilitic **m arsenite** $Hg_2AsO_3 = 724\ 8$ A brownish-white powder, insoluble in water, soluble in acids, used as a parasiticide **m benzoate** $HgC_7H_5O = 321\ 3$ A colorless crystalline powder insoluble in water used as an antiseptic **m bitartrate** $HgHC_4H_4O_6 = 349\ 3$ A colorless crystalline powder, insoluble in water **m bromide** $HgBr = 280\ 5$ Yellow, tetragonal crystals, d 7 31 sublime at 350°C, insoluble in water soluble in chloride solutions used as a substitute for calomel **m carbonate** $Hg_2CO_3 = 461\ 2$ A yellow powder, slowly decomp insoluble in water **m chloride** $HgCl = 236\ 1$ Hydrargyri chloridum mite, calomel mercury monochloride mild mercury chloride, mercury subchloride, mercury protochloride, native as horn quicksilver Colorless, rhombic, or tetragonal crystalline powder d 7 1 sublimes at 303°C insoluble in water Used as a reagent medicinally as a cathartic intestinal antiseptic and alterative, in pyrotechnics for green fires in ceramics, for gold colors **m chromate** $Hg_2CrO_4 = 517\ 2$ A red powder insoluble in water, decomp by heat **m citrate** $Hg_3C_6H_5O_7 = 790\ 8$ A colorless powder slightly soluble in water **m diammonium acetate** $Hg(NH_3)_2(C_2H_3O_2)_2 H_2O = 370\ 74$ White rectangular plates, very soluble in water **m fluosilicate** $Hg_2SiF_6 2H_2O = 579\ 29$ Colorless prisms **m formate** $HCOOHg = 245\ 62$ White glistening scales slightly soluble in water **m iodide** $HgI = 327\ 5$ Yellow mercury iodide, hydrargyri iodidum flavum, mercury protiodide, mercury monoiodide Yellowish-green, tetragonal, crystalline powder, d 7 7, m 290, b 310, insoluble in water, alcohol or,

ether, used medicinally as an alterative and antisyphilitic **m iodobenzene-p-sulfonate** Anogen A yellow, crystalline powder, insoluble in water or oils, used suspended in oil as an antisyphilitic **m lactate** $HgC_3H_5O_3$ = 289 3 A white, crystalline powder, slightly soluble in water used as an antisyphilitic **m nitrate** $HgNO_3 \cdot 2H_2O$ = 298 6 Colorless monoclinic crystals, d 4 78, decomp by heat, soluble in water Used as a reagent, and as an antiseptic caustic, and antisyphilitic **m oxalate** HgC_2O_4 = 489 22 A white powder, insoluble in water **m oxide** Hg_2O = 417 2 A black powder, d 9 8, insoluble in water *Hahnemann's-* $Hg_2O \cdot Hg_2NH_2NO_3$ = 896 4 Black precipitate, mercurius solubilis, Hahnemann's mercury A black or gray powder, insoluble in water or alcohol, soluble in acetic acid, used as an antisyphilitic and in ointments **m phosphate** Hg_3PO_4 = 681 2 A colorless powder, insoluble in water **m potassium tartrate** $HgKC_4H_4O_6$ = 387 74 White crystals, insoluble in water **m protoxide** Black m oxide Native as montroydite **m santonate** $HgC_{15}H_{19}O_4$ = 463 5 A white powder insoluble in water, slightly soluble in alcohol **m sulfate** Hg_2SO_4 = 497 3 White monoclinic crystals, d 7 56, slightly soluble in water, decomp by heat, used for batteries and standard cells **m sulfide** Hg_2S = 433 3 A black powder, insoluble in water **m tannate** $Hg_2OH(C_{14}H_9O_9)_3$ Hydrargotin A gray powder used as an antisyphilitic **m tartrate** $Hg_2C_4H_4O_6$ = 549 25 Yellowish white crystalline powder, insoluble in water *acid-* $HgHC_4H_4O_6$ = 349 65 M bitartrate White crystals, insoluble in water

mercuroxyammonium A double salt of the type $NH_2Hg_2O\,X$ *E g*, m chloride $NH_2Hg_2O\,Cl$, and m hydroxide $NH_2Hg_2O\,OH$

mercury Hg = 200 61 Hydrargyrum, Quicksilver, mercurius, liquid silver A liquid metal and element, atomic number 80 A silver-white, metallic liquid, d 13 595, freezing at −38 8, b 357 2, insoluble in water, alcohol, or ether, soluble in nitric acid Mercury occurs in nature chiefly as sulfide (cinnabar) It forms two series of compounds mercurous (valency 1), and mercuric (valency *2*) Used as a catalyst in Kjeldahl nitrogen determination, for filling gas analysis apparatus, as a catalyst, in electric cells, in the manufacture of mercury salts, the filling of thermometers, barometers, and mercury vapor lamps, in metallurgy and dentistry for amalgams with gold and silver, for electric rectifiers, and vacuum tube lights, for silvering mirrors and in the manufacture of explosives **ammoniated-** $HgNH_2Cl$ = 251 8 **Sal alembroth**, white precipitate hydrargyrum ammoniatum, mercury and ammonium chloride A white powder insoluble in water, used medicinally as an antiparasitic **biphenyl-** Mercury biphenyl **repurified-** Redistilled mercury used for dental amalgams or for electrodes **soluble-** See *soluble* **vegetable-** Manacine

m acetate, m acetylide, etc See *mercuric* and *mercurous* **m arc** An electric arc between mercury electrodes **m alloys** Mixtures of mercury with other metals If liquid or semi-liquid they are termed amalgams **m amalgams** See *m alloys*, and *amalgams* **m alkylides** An organic mercury compound of the general type, HgR_2, in which R is a monovalent alkyl radical, *e g*, mercury ethide, mercury methide, etc **m arylides** An organic compound of mercury and an aryl radical, *e g*, mercury phenide **m bichloride** Mercuric chloride **m biiodide** Mercuric iodide **m biphenyl** $Hg(C_6H_4Ph)_2$ = 506 75 Colorless crystals, m 216 **m boiler** A power plant using mercury vapor instead of steam, said to be more efficient **m cathode** (1) See dropping *electrode* (2) The positive electrode in a rectifier or a mercury vacuum tube lamp Cf *polarograph* **m cathode cup** A glass cylinder with fused-in platinum electrode, used in the electrolytic determination of mercury **m chloride** See *mercuric chloride* (sublimate), and *mercurous chloride* (calomel) *corrosive-* Mercuric chloride *mild-* Mercurous chloride **(ethyl-)** * C_2H_5HgCl = 265 11 Ethylmercuric chloride White iridescent crystals d 3 5 m 192 5 **(methyl-)** * CH_3HgCl = 251 09 Silvery crystals d 4 063, m 170 **(phenyl-)** * Chloromercurybenzene, C_6H_5HgCl = 313 11 White leaflets, m 251 **(*p*-tolyl-)** * *p*-Chloromercury toluene, MeC_6H_4HgCl = 327 12 Silky crystals m 233, insoluble in water **m cup** A small tray containing mercury into which the ends of two electric wires are dipped in order to make contact The glass bulb of a thermometer containing mercury **m dibenzyl** $Hg(CH_2Ph)_2$ = 382 72 Long needles soluble in alcohol or ether **m dibutyl** $Hg(C_4H_9)_2$ = 314 75 Colorless liquid, d 1 835, b 205 **m diethyl** M ethide **m dimethyl** M methide **m dinaphthyl** M naphthide **m diphenyl** (1) M phenide (*2*) M biphenyl **m dipropyl** $Hg(C_3H_7)_2$ = 286 72 Colorless liquid, d 2 124, b 190 insoluble in water **m ditolyl** $Hg(C_7H_7)_2$ = 382 72 White powder, m 107, b 219 soluble in hot benzene **m dropping electrode** See *electrode* **m ethide** $HgEt_2$ = 258 7 M diethyl A colorless liquid, d 2 44, b 159, insoluble in water slightly soluble in alcohol **m furnace** A retort for distilling mercury from cinnabar **m gatherer** A stirrer for collecting mercury from amalgams and rock material **m helide** The supposed compound $HgHe_{10}$ **m mass** See *mass* **m mercaptide** $Hg(SEt)_2$ = 322 8 Colorless leaflets, m 86, insoluble in water $EtSHgCl$ also exists **m methide** $HgMe_2$ = 230 66 M dimethyl A colorless liquid, d 3 069, b 96 insoluble in water soluble in alcohol or ether **m minerals** The chief ores of mercury are native mercury and its sulfide

native mercury	Hg
cinnabar	HgS
tiemannite	HgSe
coloradoite	HgTe
onofrite	Hg(S Se)
lehrbachite	HgPbSe
livingstonite	$HgSb_4O_7$
montroydite	HgO
calomel	HgCl
terlingaite	Hg_2ClO
eglestonite	Hg_4Cl_2O

m naphthide $Hg(C_{10}H_7)_2$ = 454 71 Dinaphthylmercury A white powder d 1 921 m 188 **m nitrate** See *mercuric* and *mercurous* **m nucleinate** Mercurol **m ointment** Blue *mass* **m ore** (1) Native mercury (2) Cinnabar **m oxide** See *m peroxide*, *mercuric*, and *mercurous oxide* (*black-*) Mercurous oxide (*red-*) Mercuric oxide (*yellow*)- Mercuric oxide **m periodide** HgI_2 = 962 20 A

brown unstable powder **m peroxide** HgO_2 = 232 61 An amorphous, brick-red powder, fairly stable in the absence of water **m phenide** $HgPh_2$ = 354 4 A white powder, d 2 3, m 120, insoluble in water **m phosphate** See *mercuric, mercurous* **m potassium iodide solution** See *Toulet's solution* **m protiodide** Mercurous iodide **m protochloride** Mercurous chloride **m protoxide** Mercurous oxide **m pump** Sprengel pump **m rhodanate, m rhodanide** Mercuric thiocyanate **m saccharate** A mixture of 1 pt Hg and 2 pts sugar, used as a vermifuge **m subchloride** Mercurous chloride **m subsulfate** Mercuric subsulfate **m sulfuret** See *mercuric* or *mercurous sulfide* (*black-*) Mercurous sulfide (*red-*) Mercuric sulfide **m thiocyanate reagent** A solution of 30 gm mercuric chloride and 33 gm ammonium thiocyanate in 50 cc water It gives crystals of characteristic shape with copper, cobalt and zinc solutions **m trap** M well A box used in amalgamators to prevent the escape of mercury **m vapor lamp** An evacuated glass tube containing some mercury which is vaporized by heat and gives an intense blue light on passage of an electric discharge, used in photography and as an ultra-violet light source

mer-, mere-, meri- A prefix derived from the Greek, indicating a "part"

mergal A mixture of one part mercuric cholate and two parts albumin tannate, used as an antisyphylitic

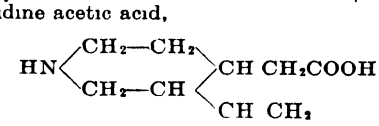
meridian A geographical unit equal to 4 quadrants or 40 million meters

meriquinone A compound whose electronic constellation resembles that of a quinone but which contains no oxygen, as, *Wurster's red*

merit number A numerical expression of the quality of a steel Merit number = ultimate strength (in pds per in ^{2}) × elongation (in inches) For the best and strongest manganese steel it is 7 millions, for the next strongest (nickel) steel, 2 millions

merochrome A chromo-isomeric crystal consisting of two isomeric forms

meroquinene $C_9H_{15}O_2N$ = 169 5 β-vinylpiperidine acetic acid,



A split-product of quinine

merotropy Desmotropy Cf *tautomerism*

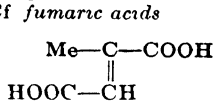
merron Proton

merthiolate $C_2H_5HgSC_6H_4COONa$ Sodium ethyl mercury thiosalicylate Colorless crystals, soluble in water, used as germicide

merwinite $Ca_3Mg(SiO_4)_2$ A calcium magnesium orthosilicate in refractory bricks and blast furnace slags, m (approx) 1590 It is formed when the mixed oxides of calcium, magnesium and silica are heated at 1500°C

mes-, meso- A prefix derived from the Greek 'middle" or "intermediate"

mesaconic acid $C_5H_6O_4$ = 130 1 Methylfumaric acid An unsaturated, dibasic acid and isomer of citraconic acid Colorless needles m 202, decomp 250, soluble in water, alcohol, or ether Cf *fumaric acids*



mescal An intoxicant spirit distilled from pulque, the fermented juice of various Mexican species of *Agave*

mescal buttons The dried buds or young leaves of *Anhalonium lewinii* (q v), used as cardiac tonic and narcotic Cf *lophophorine, pellotine*

mescaline $C_{11}H_{17}O_3N$ = 211 2 *3 4 5*-Trimethoxy-*1*-β-aminoethyl benzene (*3 4 5*-)MeO-C_6H_2 CH·CH_2NH_2(*1*) An alkaloid from *Anhalonium lewinii*, a cactus species of Central America

mesembrene $C_{28}H_{56}$ = 392 45 An unsaturated hydrocarbon from *Mesembryanthemum expansum*, a Ficoidaceae (Aizoaceae)

mesembrine $C_{16}H_{19}NO_4$ = 289 15 An alkaloid from *Mesembrianthemum tortuosum*, the kougoed or channa, an Aizoaceae of South Africa

mesh The number of openings per unit area in a screen or sieve See *particles*

mesicerin $C_9H_{12}O_3$ = 168 1 Mesitylene glycerol, $C_6H_3(CH_2OH)_3$ A colorless, viscous liquid

mesidine $C_9H_{13}N$ = 135 1 A homolog of aniline, *2 4 6*-trimethyl aniline A colorless liquid, d 0 963, b 233

mesitene lactone Dimethyl *coumalin*

mesitic acid Uvitic acid

mesitilol Mesitylene

mesitine spar Mesitite

mesitite $2MgCO_3 FeCO_3$ Mesitine spar A native magnesium and iron carbonate

mesitol $C_9H_{12}O$ = 136 1 Mesitylene alcohol, 2 4 6-trimethylphenol, $Me_3C_6H_2OH$ Colorless crystals, m 69, b 220

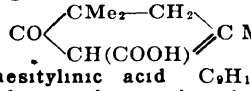
mesitonic acid $C_7H_{12}O_3$ = 114 09 Dimethyl levulinic acid, α β-dimethyl-γ-keto pentoic acid, Me CO CHMe CHMe COOH

mesityl The radical $C_6H_2Me_2CH_2$— from mesitylene **m alcohol** Mesitol **m chloride** Chloromesityl **m oxide** $C_6H_{10}O$ = 98 11 4-methyl-Δ^3-2-pentenone, MeCO CH CMe$_2$ A colorless liquid, d 0 858, b 131

mesitylene C_9H_{12} = 120 2 Mesitylol, *sym*- or 1 3 5-trimethylbenzene, $C_6H_3Me_3$ A colorless liquid, d 0 86, m −57 5, b 164, insoluble in water, soluble in alcohol or ether **chloro-** Chloromesitylene **dihydroxy-** Mesorcinol **hexahydro-** *1,3,5*-Hexahydrocumene **hydroxy-** Mesitol **m alcohol** Mesitol **m carboxylic acid** *2 4 6*-Trimethylbenzoic acid **m glycerol** Mesicerin **m lactone** Dimethylcoumalin

mesitylenic acid Mesitylinic acid

mesitylic acid $C_9H_{13}O_3$ = 169 1 trimethyl glutaric lactam The pentacyclic compound,



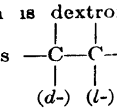
mesitylinic acid $C_9H_{10}O_2$ = 150 13 Mesitylenic acid, *sym*-dimethylbenzoic acid, $Me_2C_6H_3$-COOH White, monoclinic crystals, m 166, slightly soluble in water, readily soluble in alcohol or ether **hydroxy-** See *phenol acids*

mesitylol Mesitylene

mesityloxide See *mesityl*

meso- A prefix, indicating between

meso-form Mesomer An optically-inactive isomer containing asymmetric carbon atoms with internal compensation of the optical rotation, one C-atom is dextrorotatory, the other levorotatory, thus



(*d-*) (*l-*)

Cf *racemic* mixture

meso-paraffins See *paraffin*

meso-position (1) That of a substituting radical that is attached to a carbon atom situated between the two hetero-atoms in a ring, it is indicated by the Greek letter μ (2) The *5*- or *10*-position in the anthracene ring (3) The *10*-position in phenanthridine

mesocolloid Particles from 250 to 2500 A U long and consisting of 100 to 1000 molecules They are midway between *hemicolloids* and *eucolloids*

mesohydry A form of tautomerism which assumes divided valencies or oscillating bonds, especially between hydrogen and some other atoms, $-X\langle^{O}_{O}\rangle H$ where the dotted line indicates the oscillating bond, as in

$$-C\langle^{O}_{O}\rangle H \text{ and } -C\langle^{O}_{O}\rangle H$$

mesomer Meso-form

mesomeric Pertaining to the meso-form

mesomerism (1) Desmotropism (2) Resonance

mesomethylene carbon The 7th carbon atom in the camphane or menthane structure, which forms a bridge inside the ring system

mesomorphic The anisotropic liquid crystal shape intermediate in properties between the true liquid and the crystal states

mesonin A protein constituent of wheat gluten in which it occurs to the extent of *25* %, separates at low temperature in presence of acetic acid

mesorcin Mesorcinol

mesorcinol $C_9H_{12}O_2 = 152\ 1$ A homolog of resorcinol Mesorcin 1 3-dioxy-*2* 4 6-trimethylbenzene, 2 3-dioxymesitylene or 2 4 6-trimethylresorcinol Colorless, lustrous scales, m 150, b *275* insoluble in water

mesotan $C_9H_{10}O_4 = 182\ 1$ Ether methyloxymethylsalicylate $C_6H_4(OH)COOCH_2OMe$ A yellow liquid d 1 2 slightly soluble in water soluble in alcohol ether, or chloroform, used medicinally as an anodyne

mesotartaric acid $C_4H_6O_6\ H_2O = 168\ 1$ Colorless scales d 1 66, m 140 soluble in water See *tartaric acid*

mesothorium MsTh A radioactive isotope of radium formed from thorium (see *radioactive elements*) It is produced technically from thorium minerals, used on account of its radioactivity in luminous pigments, and medicinally, for its radium emanations Weight for weight it is 250 times as active as radium **m 1** $MsTh_1$ An isotope of element No 88, atomic weight 228 average life of 9 7 years **m 2** $MsTh_2$ An isotope of element 89, atomic weight 228, average life of 8 84 hours **m mud** Barium carbonate containing m and radium carbonates, used as source of m

mesotomy The separation of optically-inactive isomers into equal parts of dextro- and levorotatory compounds Cf *inversion resolution*

meson mesotron Heavy electron

mesoxalate A salt of mesoxalic acid

mesoxalic acid $C_3H_4O_6 = 136\ 1$ Propan-dioldioacid, dioxymalonic acid, oxomalonic acid, oxopropanedioic acid* A dibasic, dihydroxy-acid $COOH\ C(OH)_2\ COOH$ Hygroscopic, colorless needles, m 120, souble in water, alcohol, or ether **anhydrous-** Oxymalonic acid The simplest dibasic keto-acid $COOH\text{-}CO\ COOH$, from which the mesoxalyl radical is derived

mesoxalyl A bivalent radical, $CO\langle^{COO-}_{COO-}$, derived from anhydrous mesoxalic acid

mesoxalyl urea Alloxan

mesozoic An era of geologic (q v) time which followed the paleozoic and preceded the cenozoic era

mesquite gum A dark brown resin obtained from *Prosopis juliflora*, a Leguminosae of New Mexico and Texas It resembles gum arabic

met-, meta- A prefix derived from the Greek (bevond over, or after) and indicating (1) The 1 3-position of benzene cf *ortho-, para* (2) A change, exchange or transformation as in petrology, a mineral which has undergone metamorphosis (3) A polymeric compound *e g* metaldehyde (4) A less hydrous acid *e g* metaphosphoric acid (5) Any derivative of a complex compound *e g* , a metaprotein

metaacetaldehyde Metaldehyde

metaacetone Diethylketone

metaaluminates Aluminates

metaarsenate A salt of the type $MAsO_3$

metaarsenic acid See *arsenic acid*

metaarsenite A salt of the type $MAsO_2$

metabolic Pertaining to metabolism

metabolism The resultant of chemical reactions occurring in a living cell or organism by which food is transformed into living protoplasm, reserve materials stored up and waste materials eliminated **analytic-** Catabolism, or destructive metabolism The reduction of complex into simpler compounds as carbohydrates to glucose, proteins to aminoacids **basal-** The energy metabolism of an individual at rest **constructive-** Anabolism or synthetic metabolism The processes which build the more complex from the simpler compound as the construction of new protoplasm and tissues from absorbed digestive products **destructive-** Analytic *metabolism* **energy-** The heat liberated by a living organism **synthetic-** Constructive *metabolism*

metaborate A salt of the type MBO_2

metaboric acid See *boric acid*

metacasein An intermediate protein formed in the digestion of caseinogen to casein by the pancreatic juice

metacellulose An isomer of cellulose soluble in concentrated sulfuric acid insoluble in cuprammonia It occurs in fungi and lichens

metacenter The center of gravity of that portion of a floating body which is not submerged For stable flotation it should be as high as possible above the center of gravity of the body

metacetaldehyde Metaldehyde

metacetin Methacetin

metacetone Diethylketone

metacetonic acid Propionic acid

metachemistry See *chemistry*

metachromatic The property of certain substances of appearing in different colors according to the wavelength of the light in which they are viewed

metacinnabarite HgS A native, black mercuric sulfide

metacrolein $(C_3H_4O)_3 = 168\ 1$ A derivative of acrolein Colorless crystals m 45, b 170

metacompound A derivative of benzene obtained by substitution of the first and third

hydrogen atoms (See under the respective compounds)

metacresol See *cresol* **m purple** Cresol purple **m sulfon phthalein** A pH indicator, changing at pH 2 from red (acid) to yellow (alkaline), and at pH 8 5 from yellow (acid) to purple (alkaline)

metadiazine Pyrimidine

metadyne An electric machine utilising the principles of both the dynamo and electric motor to produce rapid acceleration and braking

metaelement A hypothetical substance, intermediate between an element and protyl

metafiltration Edge-filtration through superimposed metallic strips with bevelled edges, which thus involves a change from coarse filtration (due to the strips themselves) to fine filtration (due to the filter bed formed in their interstices)

metaformaldehyde Trioxymethylene

metafuel A tablet-form of metacetaldehyde, used as a solid substitute for methylated spirits in alcohol lamps

metaiodate A salt of the type MIO_3

metaiodic acid See *iodic acid*

metaisocymophenol Carvacrol

metaisomerism A form of isomerism (q v) due to the shifting of a double bond as in sterols

metakliny An intramolecular transference of groups, as the pinacone-pinacoline rearrangement (*pinacole conversion*)

metal (1) An electropositive chemical element characterized by ductility malleability lustre and conductivity of heat and electricity, which can replace the hydrogen of an acid and forms bases with the hydroxyl radical Cf *nonmetal periodic system* (2) An alloy **alkaline-** The elements of the first group in the periodic table **alkaline earth-** The elements of the second group of the periodic table Mg Ca etc **basic-** Base metal A metal which is readily oxidized, *e g*, iron in comparison with the noble metals **earth-** The elements of the third group of the periodic system Al etc **fine-** White- **fusible-** A metal or alloy of relatively low melting point *e g*, Na Pb Sn **heavy-** A metal with a density above 4 They are located in the lower half of the new periodic table q v **light-** Any metal with a density below 4 They are located in the right upper part of the new periodic table **noble-** A metal which is not readily oxidized or dissolved in acid, *e g*, members of the gold and platinum families of the periodic table **primary-** A m used for the first time Cf *secondary m* **rare-** An element which occurs only in small quantities, *e g*, Os, Ir, V, W **rare earth-** The elements of the third long period, from at no 57 to 72 **respiratory-** The metals iron manganese, copper and vanadium **secondary-** A m recovered from waste and scrap **type-** See *type* **virgin-** Primary- **white-** (1) Fine m The almost pure cuprous sulfide obtained in the Welsh process for smelting copper (2) Alloys containing large proportions of Pb or Sn, *e g*, plumber's solder, pewter, type m and certain bearing m and fusible alloys

m bath A fusible metal, as lead or tin, which can be used instead of a steam or sand bath to obtain a higher temperature **m compounds** Intermetallic compounds, usually present in alloys

metalammine Metal ammonia compound, ammino-compounds An ammine (q v) of a metal

metalammonia compound Metalammine

metalbumin Paralbumin A protein from ovarian cysts

metalceramics Powder metallurgy

metaldehyde (1) $(C_2H_4O)_8$ = 132 2 Metacetaldehyde Colorless tetragonal crystals or needles sublime 112, insoluble in water soluble in alcohol or ether, used medicinally as a sedative or hypnotic (2) $(C_2H_4O)_4$ = 176 12 A polymer of acetaldehyde, b 150 Cf *aldol paraldehyde*

metalepsis A term introduced by Dumas in 1834, to indicate a substitution

metalepsy Substitution

metalignitious Non-caking, as of coals

metallic Pertaining to metals in their uncombined forms **m carbonyls** A group of compounds of carbon monoxide with metals such as cobalt carbonyl $Co(CO)_4$, nickel carbonyl $Ni(CO)_4$ **m luster** The more or less mirror-like and bright surface of compact masses, usually metals or minerals **m nitroxyls** A group of compounds of nitrogen peroxide with metals *e g* cuprous nitroxyl $Cu_2(NO_2)$ **m oxide** An oxide of a metal **m poison** A poisonous metal salt as distinguished from vegetable and other poisons **m soap** See *soap* **m sulfides** A sulfide of a metal especially those occurring in nature as iron sulfide zinc sulfide

metalliferous Describing an ore which contains a metal

metallify (1) To convert into a metal (2) To extract a metal from its ore

metalline Resembling a metal

metallization A process by which a surface is coated with a metal

metallochrome A tint imparted to metal surfaces by metallic salts

metallography (1) The science of metals and of their ores, production, properties, and uses (2) The microscopic study of the etched surface of metals and alloys and its interpretation Cf *mineralography* (3) The modern m which relates structure of metals and alloys to their properties Cf *crystallography, phase rule diagram*

metalloid (1) A non-metal (French usage) (2) Having the physical properties of metals and the chemical properties of non-metals *e g*, As, Sb, Si, Bi

metallurgy The science and art of preparing metals from their ores smelting, amalgamation electrolytic separation, etc Cf *siderurgy* **electro-** The preparation of metals by electrical means **hydro-** The preparation of metals by leaching processes **powder-** The working of metals in the state of compressed powders *e g* as obtained by reducing the corresponding oxides Metals of very high melting point (*e g*, tungsten) may thus be formed into solid masses by heat and pressure, and can then be forged or drawn into wire **pyro-** The preparation of metals by smelting, roasting, or furnace methods

metalorganic Pertaining to a metal in organic combination **m compounds** Organometallic c A compound of organic radicals with a metal, R_xM, they are designated by the name of the radical as prefix to the metal, *e g* dimethyl zinc, methylmagnesium chloride

metamerie A term whose meaning has changed repeatedly in the history of chemistry, today it means *metamerism*

metamerism Isomerism between two compounds which contain the same number and kind of atoms, each having the same valency but the radicals in different positions Hence they produce compounds with different properties as,

$CH_3\,CH_2\,CH_2\,CO\,H$ and $CH_3\,CH_2\,CO\,CH_3$
(an aldehyde) (a ketone)

Cf *isomery*

metamers Metameric compounds A set of substances which exhibit metamerism, q v

metamorphism In geology, a change in the texture and composition of a rock due to the external agencies of heat and cold, wet and drought, etc

metamorphosis (1) In biology, a change of form or structure, as during the embryonic development of an organism (2) In geology, a change in the crystalline structure of a mineral **thermo-** Thermometamorphism

metanil yellow Metaniline yellow, sodium phenylamidobenzene metasulfonate A yellow aniline dye for wool or paper, also used in bacteriology for counterstaining tissues, and as an indicator, changing at pH 2 5 from red (acid) to yellow (alkaline)

metanilic acid $C_6H_7O_3NS\,2H_2O$ = 209 19 m-Aminobenzene sulfonic acid, aniline-*m*-sulfonic acid, $NH_2\,C_6H_4\,HSO_3$ An intermediate in dyestuff manufacture, decomp 280

metaniline yellow Metanil yellow .

metantimonate A salt of the type $MSbO_3$

metantimonic acid The monobasic acid $HSbO_3$, from which the metantimonates are derived

metapeptone A digestive product of peptone

metaperiodic acid Periodic acid

metaphen $CH_3\,C_6H_2\,ONO_2Hg$ = 783 0 The anhydride of 4-nitro-5-hydroxy mercury-*o*-cresol A yellow powder, insoluble in water, used as a germicide and antiseptic

metaphenylene The bivalent radical, $C_6H_4{=}$, derived from benzene in which substitution takes place in the *1-* and *3-*positions **m diamine** $C_6H_4(NH_2)_2$ = 108 1 Phenylenediamine, 1 3-diaminobenzene **m diamine hydrochloride** $C_6H_4(NH_2)_2\,2HCl$ = 181 0 Metadiaminobenzene hydrochloride White crystals, which are soluble in water Used as a reagent for the detection of nitrites in water

metaphosphate A salt of the type MPO_3 See *phosphates*

metaphosphinic acid (1) A group of nitrogen-phosphor acids of the general type $[PN(OH)_2]_n$ (2) $PN(OH)_2$ **hepta-** $7PN(OH)_2\,H_2O$ **tetra-** $4PN(OH)_2\,2H_2O$

metaphosphoric acid The monobasic acid, HPO_3 See *phosphoric acids*

metaposition The *1-* and *3-*positions in the benzene ring

metaprotein A hydrolytic split-product of proteins, soluble in either weak acids or alkalis, insoluble in water

metargon An isotope of argon, atomic weight 38 0

metarsenic acid Metaarsenic acid

metartrose $C_{215}H_{504}O_{106}N_{90}S$ A product obtained on digestion of the proteins of wheat

metasilicic acid The dibasic acid H_2SiO_3, derived from silicic acid

metasomatism The natural enrichment of ores by chemical reactions with external substances

metasomatosis A chemical alteration of a mineral, by which a new mineral is formed

metasome An individual mineral which has developed within another mineral

metastability An intermediate condition between stable and unstable

metastable An unstable condition which changes readily, either to a more stable or to a less stable condition **m electron** An electron moving in an excited orbit **m phase** The existence of a substance as a solid, liquid, or vapor under conditions in which it is normally unstable in that state

metastannate A salt of the type $M_2Sn_5O_{11}$

metastannic acid See *stannic acid*

metastasic electron (1) An electron which transfers from one atom to another (2) An electron which changes its position within the atom during a radioactive change, *e g* , changes from one shell to another

metastasis The alpha-change in radioactive disintegration, during which an α-particle is thrown off and two electrons pass from the valence shell into inner orbits of the atom

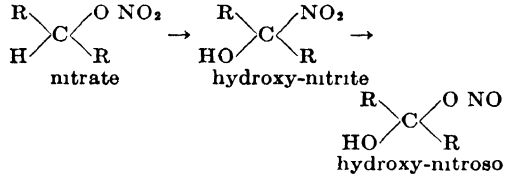
metastructure A structure having one or more dimensions between that of the molecule and the smallest structure visible microscopically, cf *colloids*, *micelle*, *mesocolloid*

metastyrene $(C_8H_8)_x$ = $(104\ 10)_x$ Metastyrolene A fatty liquid, d 1 054, b 320, (decomp) insoluble in water or alcohol, soluble in ether

metastyrolene Metastyrene

metasulfite Pyrosulfite A salt of the acid $H_2S_2O_5$ (see *sulfur* acids), only a few are known

metatenomeric change The irreversible tautomeric transformation of nitrogen compounds, as,



metatenomery An irreversible rearrangement of the atoms in a nitrogen compound

metathesis A chemical reaction (as, neutralization) in which there is an exchange of elements or radicals according to the general equation

$$\overset{+-}{AB} + \overset{+-}{CD} = \overset{+-}{AD} + \overset{+-}{BC}$$

It differs from oxidation-reduction reactions in that there is no change of valency

metathiazole Thiazole

metavanadate A salt of the type MVO_3, derived from metavanadic acid

metavanadic acid The monobasic, hypothetical acid HVO_3, which exists only in the form of its salts, metavanadates

metazoa A multicellular animal, cf *protozoa*

metazonic acid Methazonic acid

Metchnikoff See *Metshnikoff*

meteoric Pertaining to meteorites **m iron** The metallic iron which occurs in meteorites,

it usually contains nickel **m stone** A meteorite, which consists mainly of aluminum silicates **m water** Water reprecipitated as rain, snow, etc , that has entered the lithosphere from the earth's surface

meteorite Aerolite A stony or metallic body that has fallen to the earth from the outer space Three types

1 siderite	meteoric iron
2 siderolite	meteoric iron and stone
3 aerolite	meteoric stone

For average composition of m , see *abundance*

meteorograph An apparatus that automatically records atmospheric pressure, temperature, humidity, and wind velocity

meteorology A branch of physical geography that deals with the causes of climatic conditions rainfall, wind, barometric pressure, temperature, cloudiness and humidity

meter, metre (1) A unit of length which was supposed to be the $\frac{1}{10{,}000{,}000}$ part of the distance from the pole to the equator Newer measurements have shown a slight difference, so that the meter is defined as the length of a platinum-iridium bar, copies of which are kept in the principal capitals, the original being in Paris The meter is likewise defined as 1,553,164 13 times the wavelength of the red cadmium line

1 m = 100 cm = 1000 mm = 0 001 km
1 m = 39 37011 inches = 3 280843 feet = 1 093 yards = 4 97096 links = 0 198838 rods = 0 0497096 chains

(For larger and smaller units see *magnitudes, kilometer, millimeter, micron*) **atom-** Ångstrom unit **centi-** One hundredth of a meter **dynamic-** The gain in potential when a body is raised through 1 meter in a hypothetical place where g = 1000 cm /sec² It equals 10 ergs per gram See *specific energy* **fast-** A measure of the volume of a stack of wood 1 fast m = approx 35 cu ft , voids excluded Cf *cord cunit, board foot* **International-** Prototype meter The platinum-iridium bar taken as the standard meter **kilo-** One thousand meters **leo-** Dynamic m **milli-** One thousandth meter **tenth-** Ångstrom unit, *i e* 10^{-10} meter

m angle The angle of vision on viewing a point a meter distant **m. bridge** A slide-wire resistance one meter long, used in electrical resistance measurements **m candle** The intensity of illumination produced by a candle one meter distant, or the luminosity of a white surface at one meter from a standard candle **m kilogram** The force necessary to lift one kg one m

(2) A measuring device for determining the quantity of matter or force **electro-** See *electrometer* **gas-** A device for determining the quantity of gas passing through a pipeline **gaso-** Gas holder **photo-** See *photometer* **ureo-** See *ureometer* **Venturi-** A pipe-line meter for liquids

meth- A prefix indicating methyl, *e g* , methoxy

methacetin $C_9H_{11}O_2N$ = 165 1 p-methoxyacetaminophenol, p-acetanisidine p-methoxy acetanilide, m-acetaniside, $MeOC_6H_4NHCOMe$ Colorless needles, m 127, slightly soluble in water, soluble in alcohol or ether, used as an antipyretic and analgesic

methacrylic acid $C_4H_6O_2$ = 86 07 Δ^1-methyl-1-propionic acid, α-methyl-acrylic acid d 1 015 m 16 b 160 The unsaturated acid, $CH_2=CMeCOOH$, which is isomeric with vinylacetic, crotonic, and isocrotonic acid

methal Myristic alcohol

methallyl chloride $CH_2CMe\,CH_2Cl$ = 90 0 A colorless liquid d $_{20°}$ 0 925, b 72, made from petroleum hydrocarbons, used as an insecticide

methanal* Formaldehyde

methanamide* Formamide

methane*. CH_4 = 16 04 Methylhydride, MeH Cf *marsh gas, fire damp* The simplest saturated hydrocarbon A colorless, inflammable gas, d $_{air}$0 558, m −184, b −164, slightly soluble in water or alcohol It is one of the chief constituents of illuminating gas, and is formed in the decomposition of organic matter Pure methane is obtained from aluminum carbide and water, used in the manufacture of formaldehyde and in organic synthesis For most of its compounds see *methyl-* (CH_3—), *methylene* (—CH_2—), *methenyl* (=CH—) **m d** Deuteromethane, diplogen m The isotopic compounds CH_3D, CH_2D_2, CHD_3 and CD_4 **azi-** Diazomethane* **bromo-*** Methylbromide **chloro-*** Methylchloride **cyano-** Acetonitrile **diazo-*** Diazomethane **dibromo-*** Methylene bromide **dichloro-*** Methylene chloride **dichlorodifluoro-*** Dichlorodifluoromethane **dimethoxy-*** Formal **dimethyl-** Propane* **dimethylethyl-** Isopentane **diphenyl-** Diphenylmethane **diphenylene-** Fluorene **fluoro-*** Methyl-fluoride **hydroxy-** Methanol **iodo-*** Methyliodide **methoxy-*** Methylether **methyldithio-*** Methyldisulfide **methyl thio-*** Methyl sulfide **nitro-*** CH_3NO_2 = 61 03 A colorless liquid, d 1 130, m −29 2, b 101 9, slightly soluble in water **phenyl-** Toluene **tetrabromo-*** Carbon tetrabromide **tetrachloro-*** Carbon tetrachloride **tetrahydroxy-** *ortho*-Carbonic acid **tetramethyl-** *tert* -Pentane **tribromo-*** Bromoform **trichloro-*** Chloroform **trichloronitro-*** Chloropicrin **trifluoro-*** Fluoroform **triiodo-*** Iodoform **trimethyl-** Isobutane

m acetic acid Gentaric acid **m acid** Formic acid **m alcohol** Methanol **m aldehyde** Formaldehyde **m amide** Formamide **m arsonic acid** Methylarsinic acid **m base** Tetramethyl diamino diphenylmethane **m chloride** Methyl chloride **m dicarboxylic acid** Malonic acid **m disulfonic acid *** Methionic acid **m phosphonic acid** Methylphosphinic acid **m series** Paraffins, alkanes A group of saturated hydrocarbons of the general formula C_nH_{2n+2} denoted by the suffix *-ane*

10 cm = $\frac{1}{10}$ meter (actual size)

METHANE SERIES

Paraffins, alkanes, saturated aliphatic hydrocarbons

CH_4	Methane, methylhydride, MeH	1*
C_2H_6	Ethane ethylhydride, EtH	1
C_3H_8	Propane propylhydride PrH	1
C_4H_{10}	Butane, butylhydride, BuH	2
C_5H_{12}	Pentane, amylhydride	3
C_6H_{14}	Hexane, hexylhydride	5
C_7H_{16}	Heptane, heptylhydride	9
C_8H_{18}	Octane, octylhydride	18
C_9H_{20}	Nonane, nonylhydride	35
$C_{10}H_{22}$	Decane, decylhydride	75
$C_{11}H_{24}$	Undecane undecylhydride	159
$C_{12}H_{26}$	Dodecane, dodecylhydride	355
$C_{13}H_{28}$	Tridecane, tridecylhydride	802
$C_{14}H_{30}$	Tetradecane, tetradecylhydride	1858
$C_{15}H_{32}$	Pentadecane, pentadecyl hydride	4347
$C_{16}H_{34}$	Hexadecane, hexadecyl hydride	10,359
$C_{17}H_{36}$	Hepdecane heptadecyl hydride	24,894
$C_{18}H_{38}$	Octodecane, octodecyl hydride	60 523
$C_{19}H_{40}$	Nondecane, nondecyl hydride	147,284
$C_{20}H_{42}$	Eicosane, eicosyl hydride	366,319
$C_{21}H_{44}$	Heneicosane, heneicosyl hydride	
$C_{22}H_{46}$	Docosane, docosyl hydride	
$C_{23}H_{48}$	Tricosane, tricosyl hydride	
$C_{24}H_{50}$	Tetracosane, tetracosyl hydride	
$C_{25}H_{52}$	Pentacosane, pentacosyl hydride	36 797,588
$C_{26}H_{54}$	Hexacosane, hexacosyl hydride	
$C_{27}H_{56}$	Heptacosane, heptacosyl hydride	
$C_{28}H_{58}$	Octocosane octocosyl hydride	
$C_{29}H_{60}$	Noncosane noncosyl hydride	
$C_{30}H_{62}$	Triacontane	4 111,846,763
$C_{31}H_{64}$	Hentriacontane, hentriacontyl hydride	
$C_{32}H_{66}$	Dotriacontane, dotriacontyl hydride	
$C_{35}H_{72}$	Pentatriacontane, pentatriacontyl hydride	
$C_{40}H_{82}$	Tetracontane	62 491 178,805,831
$C_{60}H_{122}$	Hexacontane, hexacontyl hydride	

* The number of possible isomeric forms

m silicoic acid $MeSiOOH$ = 76 09 Silicoacetic acid White powder insoluble in water **m stannoic acid** $MeSnOOH$ = 106 73 Methylstannic acid, stannoacetic acid White amorphous powder, infusible and insoluble in water **m sulfonic acid*** Methylsulfonic acid **m sulfonylchloride** * $MeSO_2Cl$ = 114 - 54 Colorless liquid, d 1 51, b 160 **m thial*** Thioformaldehyde **m thiol*** CH_3SH = 48 - 09 Methylmercaptan Colorless liquid or gas, d 0 868, m −123, b 7 6 **m triacetic acid** Centaric acid

methano- A prefix indicating a $—CH_2—$ bridge in a ring compound, as *1 8-*, *2 9-* and *9 10-* methanoanthracene indicating the $—CH_2—$ group between the carbon atoms 1 8-, 2 9- and 9 10-respectively

methanoic acid* Formic acid

methanol* CH_4O = 32 04 Methyl alcohol, carbinol wood alcohol, pyroxylic spirit, wood spirit, wood naphtha, columbian spirit, colonial spirit, methyl hydroxide, CH_3OH or MeOH A colorless liquid, d 0 810, m −97 1, b 64 7, inflammable soluble in water alcohol, or ether Used as a solvent in place of alcohol (ethanol) for varnishes paints, organic compounds, as fuel, in the manufacture of formaldehyde, in organic synthesis and for denaturing alcohol (ethanol) For derivatives see *carbinol* ($—CH_2OH$)

methanoyl Formoyl

methazonic acid Metazonic acid

methemoglobin A transformation product derived from oxyhemoglobin but not from hemoglobin, having the same composition as the latter but with its oxygen more firmly bound, it contains trivalent iron It occurs in transudates containing blood and in urine after hematuria Molecular weight, 16,666 Cf *porphin*

methenamine Hexamethylene tetramine

methene Methylene The bivalent group $—CH_2—$ Cf *methano* **m disulfonic acid** Methionic acid

methenyl Formylene- methine The trivalent radical $HC\equiv$ **di-** Acetylene **m bromide** Bromoform **m chloride** Chloroform **m iodide** Iodoform

methethyl A mixture of ethyl and methyl chlorides used as a local anesthetic

methide A methyl compound of a metal as $MgMe_2$ or $AlMe_3$

methine Methenyl $HC\equiv$

methionic acid $CH_2(SO_3H)_2$ = 176 3 Methene disulfonic acid Colorless hygroscopic crystals used in organic synthesis

methionine $C_5H_{11}NO_2S$ = 149 15 *2*-Methylthiol-*α*-aminobutyric acid, *2*-amino-*4*-methylthiobutanoic acid*, $MeS\,CH_2\cdot CH_2\cdot CHNH_2\cdot COOH$ An amino acid obtained from many proteins, *e g* , casein, edestin, gelatin and wool m 283 (decomp)

methionyl The bivalent radical $—SO_2\cdot CH_2\cdot SO_2—$

metho- A prefix indicating that a methyl group is attached to a carbon atom of a side-chain or sometimes to a nitrogen atom in a ring, as, methochloride of pyridine

methonal $C_5H_{12}O_2S$ = 136 1 Dimethyl sulfone dimethyl methane $Me_2CSO_2Me_2$ Colorless crystals soluble in water, used as a hypnotic

methose $C_6H_{12}O_6$ = 180 09 A carbohydrate synthesized by the polymerization of formaldehyde in presence of magnesia Cf *i-fructose*

methoxide Methylate

methoxy- A prefix indicating the presence of a methoxy group, $—OCH_3$

m group The monovalent $CH_3O—$ or MeO—radical **m phenylacetone** Anisacetone

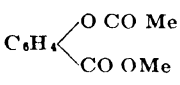
methoxybenzoic acid $C_8H_8O_3$ = 152 1 **ortho-** 2-methoxybenzoic acid Colorless monoclinic scales, d 1 18, m 98 slightly soluble in water **meta-** 3-methoxy-benzoic acid Colorless needles, m 167, slightly soluble in water, soluble in alcohol or ether, used in organic synthesis **para-** Anisic acid

methoxyl Methoxy, MeO— **m amine** Methyl hydroxylamine

methozan Antipyrine

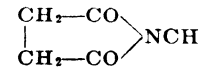
methyl The monovalent $CH_3—$ or Me— radical **m acetamide** C_3H_7ON = 73 1 $MeCO\cdot NHMe$ **m acetanilide** Exalgin **m acetate** $C_3H_6O_2$ = 74 0 The ester, $MeCOOMe$ A colorless, volatile, inflammable liquid with a fragrant apple-like odor, d 0 924, m −98, b 54,

soluble in water, alcohol, or ether, used as a solvent, and in flavoring extracts **m acetic acid** Propionic acid **m acetoacetate** $C_5H_8O_3$ = 116 03 $MeCOCH_2COOMe$ A colorless liquid, d 1 077, b 170, used in organic synthesis **m acetone** A mixture of methylacetate and acetone, used as a solvent for rubber **m acetyl** Acetone **m acetylene** Allylene **m acetylsalicylate** $C_{10}H_{10}O_4$ = 194 08



Colorless crystals, m 54 It is an isomer of dimethyl phthalate **m acrylic acid** See *acrylic acids* **m alcohol** Methanol **m aldehyde** Formaldehyde **m allylphenol** Anethol **m amidophenol** Anisidine **m amine*** CH_3NH_2 = 31 1 Aminomethane A colorless gas, d_{11}^{0} 0 699, m −92 5, b_{760mm} − 6, soluble in water It is formed in the distillation of wood and bones the putrefaction of fats in putrefying fish and is a constituent of mercurialis **m allyl ether** Allyl m ether **m amyl ketone** $MeCOC_5H_{11}$ = 114 11 A constituent of oil of cloves and oil of cinnamon **m aniline** C_7H_9N = 107 12 C_6H_5NHMe d 0 986, m −80 b 193 8 **m anthranilate** $C_8H_9O_2N$ = 151 08 M o-aminobenzoate $NH_2C_6H_4CO$-OMe Colorless crystals, d 1 168 m 24 5 b 125, soluble in alcohol or ether It has an orange flower odor, used in perfumery and cosmetics **m arsenic acid** *mono-* Arrhenic acid *di-* Cacodylic acid Cf *m arsinic acid* **m arsine** See *arsine* **m arsine dichloride** CH_3AsCl_2 = 160 90 A volatile liquid, d 1 858, m −59, b 136, used in organic synthesis **m arsenic acid** $MeAsO(OH)_2$ = 139 97 White monoclinic leaflets, m 161, soluble in water Cf *m arsenic acid* **m arsenious oxide** CH_3AsO = 105 98 The anhydride of arrhenic acid, Me_2AsO, m 95 **m azide** CH_3N_3 = 57 1 Azoimidemethane methyl azoimide The hypothetical compound, $CH_3N\langle{}^{N}_{N}\rangle\!\!\parallel$, known from its derivatives **m benzene** Toluene **m benzoate** $C_8H_8O_2$ = 136 1 Essence niobe, PhCOOMe The simplest aromatic ester A colorless fragrant liquid, d 1 094, m −12 b 198 insoluble in water, soluble in alcohol or ether, used in perfumery **m benzoic acid** Toluic acid **m borate** $C_3H_9O_3B$ = 104 0 Trimethoxyboron, $B(OMe)_3$ A volatile liquid d_0^{0} 0 94 It imparts a green color to a flame and is used to test for borates in foods etc **m bromide** CH_3Br = 95 0 Bromomethane* A colorless, volatile liquid, d 1 732, m −84 b 4 5 insoluble in water, soluble in alcohol or ether Used in organic synthesis, in refrigerators and as an antiseptic **m bismuthine** $MeBiH_2$ = 226 04 A colorless liquid, d 2 30, b 110, insoluble in water **m blue** A pH indicator changing at 11 from blue (acid) to brown (alkali) **m butyl** Pentane **m butyl carbinol** Hexyl alcohol **m butyrate** $C_5H_{10}O_2$ = 102 08 The ester $C_3H_7COOCH_3$ used in perfumes **m capri blue** An oxidation-reduction indicator, q v **m carbamate** Urethylan **m carbimide** CH_3NCO, methyl ψ-cyanate **m carbinol** Ethanol **m carbonate** See *carbonic acid esters* **m carbylamine** CH_3NC = 41 1 Methylisocyanide acetoisonitrile, d 0 76 A volatile liquid of characteristic unpleasant odor, m −45 b 59 6, slightly soluble in water, alcohol or ether **m catechol** Guaiacol **m cellosolve** See *cellosolve* **m chloride** CH_3Cl = 50 5 Chloromethane* Artic arctic A colorless gas d 0 918, m −91 5, b −23 7, soluble in water or alcohol Used medicinally as an external anesthetic and refrigerant **m chlorofluoride** Dichlorodifluoromethane **m chloroform** $MeCCl_3$ = 133 4 Trichlorethane ethenylchloride A colorless, volatile liquid of pungent odor, d 1 346 b 74, used as an anesthetic **m cinnamate** C_8H_7COOMe = 162 08 White crystals d 1 091 m 36 b 261, insoluble in water, used as an insect bait **m cocaine** Cocamidine **m crotonic acids** See *tiglic* and *angelic acids* **m cyanate** C_2H_3ON = 57 04 $N{\equiv}COCH_3$ Cf *m isocyanate* **m cyanide** Acetonitrile **m cyclohexane** Hexahydro toluene **m diacetyl** A diketone pentane-2 3-diketone or 2 3-pentanone, $MeCOCOEt$ **m disulfide** $C_2H_6S_2$ = 94 19 Methyldithiomethane* $MeSSMe$ **m ene** Methylene A colorless liquid b 112 **m ether** C_2H_6O = 46 06 Dimethyl ether methoxymethane*, $MeOMe$ A gas d 1 617 m −138 b −25, soluble in alcohol slightly soluble in ether or water, used as a refrigerant **m ethylamine** $MeNHEt$ **m ethylether** $MeOEt$ **m ethylketone** C_4H_8O = 72 1 Butanone, M E K, $MeCOEt$ A colorless inflammable liquid d 0 808, m −86, b 80, soluble in water, alcohol, or ether, used in organic synthesis, as a solvent, and in the manufacture of colorless plastics **m fluoride** CH_3F = 34 02 Fluoromethane* A colorless gas, b −78 **m formate** $C_2H_4O_2$ = 60 1 Methyl formic acid ester $HCOOMe$ A colorless liquid, d 0 973 m −100, b 32, soluble in water, alcohol, or ether used in organic synthesis **m gadenine** $C_8H_{19}NO_2$ = 161 16 A poisonous oxygenated ptomaine from fish **m gallate** Gallicin **m gallium dichloride** $GaMeCl_2$ = 155 66 White crystals, m 75, decomp in water **m glycine** Sarcosine **m glycosine** Sarcosine **m glyoxal** Pyruvic aldehyde **m glyoxalidine** Lysidine **m green** A triphenylmethane dye $(Me_2N{-}C_6H_4)_2C{=}C_6H_4{=}NMe\,Cl$, used in dyeing silk, in bacteriology to stain mitochondria and as pH indicator changing from yellow (acid) through blue green to colorless (alkaline) **m guanidine** $MeN(NH)_2$ = 73 06 A ptomaine formed from creatine or arginine **m heptenone** $Me_2C{=}CH(CH_2)_2COMe$ = 126 11 Colorless liquid, d 0 860, m 67 3 b 174 found in some essential oils **m heptine carbonate** Heptine methyl carbonate **m heptyl ketone** 2-Nonanone* **m hexalin** Methyl cyclohexanol **m hexane** Heptane **m hexylketone** Hexylmethyl ketone **m hydrate** Methanol **m hydrazine** $MeNH{-}NH_2$ = 46 07 A liquid $b_{74\ mm}$ 87 **m hydrazone** $MeCH{=}NNH_2$ **m hydroxide** Methanol **m hydroxy-benzene** (1) Cresol (2) Hydroxybenzyl alcohol **m hydroxylamine** See *hydroxylamine* **m indole** Skatole **m iodide** CH_3I = 142 0 Iodomethane* A colorless liquid, d 2 28 m −66, b 44 insoluble in water, soluble in alcohol or ether, used in organic synthesis, and as a local anesthetic **m isocyanate** C_2H_3ON = 57 04 $CONMe$ b 45 cf *m cyanate* **m isocyanide** C_2H_3N = 41 03 Methylcarbylamine, m isonitrile,

MeNC A colorless liquid, d 0 756 m −45, b 60 **m isophthalic acid** 4- Seylidic acid 5- Uvitic acid **m isothiocyanate** M *mustard oil* **m mercaptan** Methane thiol **m mercuric chloride** $MeHgCl$ = 251 09 White crystals with a disagreeable odor, d 4 063, m 170 **m mercuric iodide** $MeHgI$ = 342 55 Pearly leaflets, m 145, insoluble in water **m morphine** Codeine **m nitramine** $CH_4N_2O_2$ = 76 0 $Me\,NH\,NO_2$ **m nitrate** CH_3NO_3 = 77 04 Me—O—NO_2 An explosive liquid, d 1 12 soluble in water **m nitrite** CH_3NO_2 = 61 04 Me—O—NO A gas, d 0 99, b −12 **m nitrobenzene** Nitrotoluene **m nitrolic acid** Formoxime **m nitrosamine** $CH_4N_2O_2$ = 60 1 Me—NH—NO **m nonyl ketone** 2-Hendecanone* **m orange** The sodium salt of p-dimethylaminoazobenzenesulfonic acid, $Me_2NC_6H_4N\ NC_6H_4SO_2Na$ An orange-yellow powder soluble in water or alcohol It is used as an indicator in volumetric analysis, (alkalis, yellow, acids, red, pH range 3 1–4 4) **m oxide** M ether **m oxyaniline** Anisidine **m pentose** A sugar, $C_5H_{12}O_5$ containing 6 carbons but only 5 hydroxy groups, as fucose, rhamnose **m phenate** Anisole **m phenidine** See *phenacetin* **m phenylacetamide** Exalgin **m phenyl ether** Anisole **m phosphate** CH_5O_4P = 112 09 The solid $MePO_2(OH)_2$, m 105 **m phosphine** CH_5P = 48 09 The gas $MePH_2$, b −14 soluble in water or alcohol **m phosphinic acid** $CH_3PO(OH)_2$ = 96 06 Methane phosphonic acid Colorless crystals m 105 **m propionate** $EtCOOMe$ = 88 06 M propanoate*, colorless liquid d 0 9148, m −87, b 79 9, soluble in water, used in perfumes **m propyl ether** $C_4H_{11}O$ = 74 77 MeOPr A colorless liquid d 0 738 b 38 9 **m propyl ketone** $C_5H_{10}O$ = 86 77 Acetylpropane 2-pentanone*, $Me\,CO\,Pr$ A colorless liquid d 0 812, m −77 8, b 101 7 **m propylphenol** Thymol **m pyridine** Picoline **m pyruvate** $C_4H_6O_3$ = 102 05 $MeCOCOOMe$ A liquid d 1 154 b 137, used as a solvent for resins **m quinolines** *alpha*-Quinaldine *gamma*- Lepidine **m red** $C_{18}H_{18}O_2N_3$ = 269 3 p-dimethylaminoazobenzene carboxylic acid, $Me_2NC_6H_4N\ NC_6H_4COOH$ A dark red powder insoluble in water, soluble in alcohol or ether, used as an indicator for titrating ammonia, alkaloids, and weak organic acids (alkalis yellow, acids, violet red, pH range 3–6) **m resorcinol** Orcinol **m rhodanate, m rhodanide** M thiocyanate **m rubber** An early name for synthetic rubber made by polymerisation of dimethyl butadiene Cf *elastomer, plastics* **m salicylate** $C_8H_8O_3$ = 152 1 Artificial wintergreen oil, methylic salicylas, synthetic oil of wintergreen, $C_6H_4(OH)COOMe$ A colorless, liquid, d 1 183, m −8, b 222, insoluble in water, soluble in alcohol or ether Used medicinally as an antipyretic, antiseptic, and in antirheumatic liniments, also in flavoring extracts and confectionery **m salicylic acid** $MeC_6H_3(OH)COOH$ **m selenide** Selenium dimethyl **m silicane** CH_6Si = 46 11 SiH_3CH_3 A colorless gas, d_{-57} 0 62, m −156 5, b −56 8 **m stannic acid** CH_4O_3Sn = 166 73 $MeSnOOH$ White amorphous powder insoluble in water **m styryl ketone** Benzylidene acetone **m succinic acid** Pyrotartaric acid **m succinimide** $C_5H_7O_2N$ = 113 1 1-Methyl-2 5-diketopyrrolidine



m sulfate Me_2SO_4 = 126 1 Dimethylsulfate A colorless liquid, d 1 352, m −10, b 188, slightly soluble in water, soluble in alcohol or ether Used as a poison gas in warfare, and in organic synthesis, for methylating phenols and amines **m sulfide** Me_2S = 62 1 Dimethylsulfide, methylthiomethane, methyl thioether A colorless liquid, d 0 845, m −83, b 37, insoluble in water, soluble in alcohol or ether used in organic synthesis **m sulfine** CH_4O_2S = 80 1 Me—SO—OH **m sulfocyanide** M thiocyanate **m sulfonal** Trional **m sulfone** $C_2H_6O_2S$ = 94 1 Me—SO_2—Me **m sulfonic acid** CH_4O_3S = 96 1 Methane sulfonic acid* Me—SO_2—OH A syrupy liquid, d 1 481, decomp 130 **m sulfoxide** C_2H_6OS = 78 1 Me—SO—Me **m tartronic acid** Isomalic *acid* **m telluride** $(CH_3)_2Te$ = 157 1 A light-yellow liquid with garlic-like odor, b 82 **m theobromine** Caffeine **m thiocyanate** CH_3CNS = 73 1 M rhodanate m rhodanide, m sulfocyanide A colorless liquid, d 1 088 b 133, soluble in alcohol or ether **m thionine chloride** Methylene blue **m thiophen** Thiotolene **m tin bromide** CH_3SnBr_3 = 373 47 White needles m 54 b 211 soluble in water **m tin chloride** CH_3SnCl_3 = 240 09 Colorless crystals, m 43 soluble in water **m tin iodide** CH_3SnI_3 = 514 48 Yellow needles, m 86 5, soluble in water **m toluidine** Xylidine **m urea** See *urea* **m urethane** Urethylan **m violet** Crystal violet, pyoktanin blue A mixture of the hydrochlorides of pentamethyl-p-rosaniline and hexamethyl-p-rosaniline Dark green, lustrous crystals, soluble in water or alcohol Used as a reagent, indicator, and as a textile dye (Alkalis violet, acids yellow, pH range 2–3 1)

methylal Formal

methylamine See *methyl*

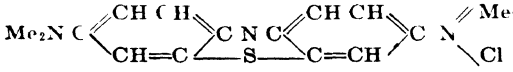
methylamino- A prefix indicating the monovalent —NHMe radical

methylate (1) The introduction of the methyl radical, or the substitution of a methyl group for another atom or radical (2) Methoxide A compound of a metal with the methoxy group, of the general type CH_3OM, *e g*, sodium methylate, $NaOCH_3$ (3) To add methanol with or without other substances, to grain alcohol to render it unpotable (denaturate)

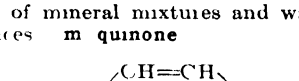
methylated ether Ethyl ether made from methylated spirit instead of from pure ethanol **m spirit** Rectified spirit (q v) denatured by addition of 10 % of crude wood spirit, 0 4 % of mineral naphtha or pyridine and a purple coloring matter Cf *ethanol* **power m s** The official British term for alcohol denatured for power purposes

methylation The process of substituting a CH_3— group for an H atom

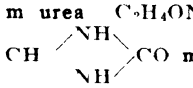
methylene Methene The bivalent radical —CH_2—, derived from methane Cf *di-, tri-tetra-, penta-, hexa-, hepta-methylene* **meso-** See *mesomethylene* **trioxy-** Paraformaldehyde **m blue.** $C_{16}H_{18}N_3SCl\ 3H_2O$ = 373 7 Tetramethylamidophenthiazinium chloride, methylthionine chloride, tetramethylthioninchlorhydrate, methylthioninae chloridum U S P a dye of the thiazine group



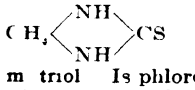
Dark blue-green crystals with a metallic luster, soluble in water or alcohol Used as an indicator in volumetric analysis, for determining sugars, chlorates or perchlorates, in bacteriology, as stain, in medicine, as an antidote to cyanide poisoning, as anodyne and a antiperiodic, in the textile industry, as a dye *alkaline-* A solution containing 5 gm methylene blue 5 gm sodium percarbonate per liter of water, used as a stain **m bromide** CH_2Br_2 = 174 0 Dibromomethane* A colorless or yellowish liquid, d 2 59, b 98, insoluble in water, soluble in alcohol or ether, used in organic synthesis **m chloride** CH_2Cl_2 = 85 0 Dichloromethane* methylbichloride carrene A colorless liquid, d 1 377, m −96 7 b 40 5, soluble in alcohol or ether Used medicinally as an anesthetic in the skin spray, in industry, as a solvent, constituent of lacquers, degreaser, dewaxing and spotting agent, as a refrigerant, for air conditioning **m cyanide** Malonitrile **m dicotoin** Fortoin **m dioxy** The bivalent radical, —OCH_2O **m disulfonic acid** Methionic acid **m ditannin** Tannoform **m glycol** CH_4O_2 = 48 0 The hydrated form of formaldehyde, $CH_2(OH)_2$, present in aqueous formalin solution **m imine** See *methylenimine* **m iodide*** CH_2I_2 = 267 86 Diiodomethane, methylbiiodide A yellow liquid, d 3 335, m 4, b 180, insoluble in water, soluble in alcohol, or ether, used for determining the density of mineral mixtures and water-soluble substances **m quinone**



m urea $C_3H_4ON_2$ = 72 1



m thiourea $C_2H_4N_2S$ = 88 1



m triol Is phloroglucitol

methyleneblue See *methylene*

methylenimine CH_3N = 29 01 Azomethine The simplest imine, $H_2C{=}NH$

methylgreen See *methyl*

methylic An obsolete term for methyl **m acid** Formic acid **m alcohol** Methanol

methylin A lignin extracted from wood, straw or other plant material by the mono-methyl ether of ethylene glycol

methylis The Latin term for methyl, used in the U S P

methyloic A prefix indicating that the —COOH or carboxyl group is present as a sidechain, thus $Et_2CH\ COOH$ is pentane-*3*-methyloic acid (diethylacetic acid) Cf *ethyloic, propyloic*

methylol Hydroxymethyl The monovalent radical, $HO\ CH_2$— See *carbinol*

methylorange See *methyl*

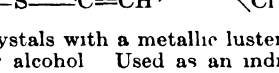
methylviolet See *methyl*

methysticin Kavain

methysticum Kava

metol C_7H_9ON = 123 1 Methyl-p-aminophenol, pictol, rhodol, MeNH—C_6H_4OH Used as its hydrochloride or hydrosulfate, as a photographic developer **m poisoning** A mismomer for dermatitis caused by alkali, or by *p*-dimethyldiaminobenzene formerly an impurity of metol

metoxazine C_4H_9ON = 87 1 The ring compound



metozine Antipyrine

metrazol $C_5H_{10}N_4$ = 126 1 Pentamethylenetetrazole White monoclinic crystals m 58 soluble in water, thought to be a heart stimulant

metre Meter

metric (1) Pertaining to measure **gravi-** Analysis involving the use of the balance **volu-** Analysis carried out by measuring volumes with pipette and burette (2) Pertaining to the system of weight and measures of which the meter is the basis **m slug** See *slug* **m system** The weights and measures based on the "meter," from which all other scientific units are derived The multiples of units are uniformly prefixed with the Greek terms

mega	= 1,000,000	= 10^6
myria	= 10 000	= 10^4
kilo	= 1,000	= 10^3
hekto	= 100	= 10^2
deka	= 10	= 10^1

The fractions of units are uniformly prefixed with the Latin terms

deci	= $\frac{1}{10}$	= 1	= 10^{-1}
centi	= $\frac{1}{100}$	= 01	= 10^{-2}
milli	= $\frac{1}{1000}$	= 001	= 10^{-3}
micro	= $\frac{1}{1000000}$	= 000001	= 10^{-6}

The units commonly used are

Length = meter = m , also km , cm mm and μ (10^{-6} m) mμ $\mu\mu$
Area = square meter = m^2, also are = 100 m
Volume = liter = l , also cc (cubic-centimeter) and λ (10^{-6} l)
Mass = gram = g , also kg , mg and γ (10^{-6} g)

m ton One thousand kilograms = 2204 6 pounds

metronome An instrument for measuring short time intervals, usually by means of a mechanically driven pendulum

metrotonin An ergot substitute consisting of epinephrine, acetylcholine and other amines

-metry A suffix indicating measurement and measuring

Metshnikoff, Elie Metchnikoff 1845–1918 A Russian physiologist, noted as the discoverer of phagocytosis

metso Sodium metasilicate used as a scouring agent

metycaine Neothesin, hydrochloride of γ-(2-methyl piperidino) propyl benzoate A white powder, used as local anesthetic

mev or MEV Abbreviation for million electron volts

Mexican poppy oil A brownish-yellow oil extracted from the seeds of prickly poppy, *Argemone mexicana*, d 0 922, used in soap manufacture **M onyx** A variety of calcite used in interior decorations **M scammony root** Ipomoea

Meyer, Lothar Julius 1830–1895 A German chemist noted as a discoverer of the periodic system Cf *Mendeléeff* **M , Victor** 1848-

1897. A German chemist noted for his research in stereochemistry and organic chemistry, and for his methods of vapor-density determination. **M.'s formula.** (1) See *molecular free path.* (2) An equation connecting viscosity (q.v.) and temperature. **M.'s law.** Law of *esterification.* **M.'s theory.** Anesthetics and narcotics are generally substances which diffuse rapidly. See *liminal value.* **M.'s tube.** An absorption tube for CO_2, filled with $Ba(OH)_2$; used in steel analysis. **M.'s value.** Liminal value. Cf. *Mayer.*

meyerhoffite. $2CaO.3B_2O_3.7H_2O$. A native calcium borate.

meymacite. $WO_3.H_2O$. A native, hydrated tungsten oxide, light-brown, resinous masses.

meymacite. A native hydrated tungsten oxide, $WO_3.H_2O$; light-brown, resinous masses.

mezcal. Mescal.

mezcaline. Mescaline.

mezereum. Mezereon.

mezereon. Mezereum, dwarf bay, paradise plant, wild pepper, spurge flax. The dried bark of *Daphne mezereum,* a European shrub; used medicinally as a diaphoretic stimulant or diuretic. Cf. *daphnin.*

mezquit. The shrub or tree *Prosopis juliflora* of Mexico and the S. W. United States. Its gum resembles gum arabic.

mg. Milligram. **mg.-%.** Mg. per 100 cc.

Mg. Symbol for magnesium.

mho. A unit of electrical conductivity (the reciprocal of ohm, the unit of resistance). One mho conductance per centimeter cube with a potential of one volt allows the passage of one ampere current per square centimeter.

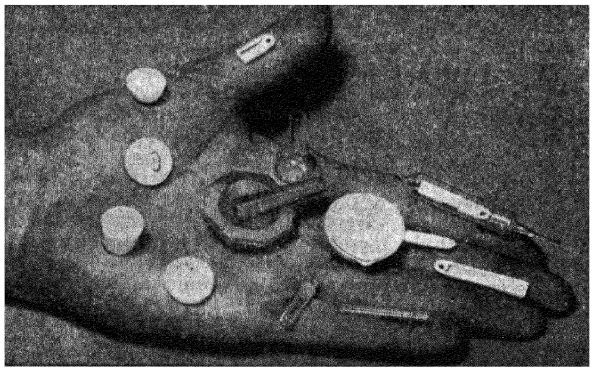
miamine. Chlorazene.

miargyrite. $AgSbS_2$. A silver sulfide ore.

miasma, miasm. A noxious exhalation, or vapors arising from swamps.

miazines. Meta-diazines or pyrimidines. A group of heterocyclic compounds having two nitrogen atoms in the meta position; as, pyrimidine and quinazoline. Cf. *piazines, oiazines.*

mica. (1) One of a group of laminated silica minerals (q.v.). (2) $3Al_2O_3.K_2O.6SiO_2.2H_2O$. Isinglass, muscovy glass. A native hydrous silicate, which can be split into very thin transparent sheets. Used as an insulator for electrical instruments; as windows in furnaces and refracting instruments; and in the ground state, as a lubricant. The term is used in geology as a prefix to rocks containing it, such as mica basalt. **amber-** Phlogopite. **lithia-, lithium-** Lepidolite. **potash-** $KH_2Al_3(SiO_4)_3$, potassium metasilicate. **ruby-** Muscovite. **m. black.** See *hibernium.*



Microchemical apparatus.

micell(e). (1) An electrically-charged colloidal particle; a colloidal ion, consisting of oriented molecules. Cf. *zone.* (2) An oriented arrangement of a number of molecules; as in cellulose, rubber, starch, where there are no or few unshared electron pairs. Cf. *liquid, association.* (3) An aggregate composed of a number of molecules held loosely together by secondary forces (which are weaker than primary valence bonds). Cf. coordinate *bonds.*

Michael's reaction. An organic addition reaction in which the sodium salts of acetocetic acid or malonic esters disrupt the double bond to unsaturated compounds of the type, R—CH:-CH—X, where X is a carbonyl or cyanogen radical.

Michler's hydrol. $C_{17}H_{22}N_2O$ = 270.19. *p*-Tetramethyl diaminobenzo hydrol, $(Me_2NC_6H_4)_2CH_2OH$. White crystals, m.96, used in organic synthesis. **M. ketone.** $C_{17}H_{20}ON_2$ = 268.3. Tetramethyl-p,p'-diaminobenzo-phe-none, $(Me_2NC_6H_4)_2CO$. Colorless, lustrous plates or scales, m.172, b.360, insoluble in water, soluble in alcohol. Used in the synthesis of dyestuffs and auramine derivatives.

micrinite. An opaque material found in coal durains (q.v.), and intermediate in character between fusain and vitrain.

micro- (1) A prefix derived from the Greek, indicating small. (2) The one-millionth part of a unit; as, μ = micrometer, λ = microliter and γ = microgram.

microampere. One-millionth of an ampere.

microanalysis. The identification of substances by examination with the microscope. Cf. *microchemistry, microreaction.*

microbalance. A very sensitive balance (*e.g.,* based on the torsion of a very fine quartz fibre, as McBain balance). Used for weighing micro quantities.

microbe. An microorganism of animal or vegetable nature; generally those which may cause disease, as bacteria and pathological protozoa.

microbic. Pertaining to microorganisms.

microbicide. Any agent that destroys microorganisms.

microbin. $C_7H_4ClO_2Na$ = 178.6. Sodium-*p*-chlorobenzoate, $Cl.C_6H_4COONa$. White crystals, soluble in water, used as a preservative.

microbiology. The study of microorganisms or microbes.

microburner. A small bunsen burner.

microcalorie. See small *calorie.*

microchemical. (1) Pertaining to reactions observed under the microscope. (2) Pertaining to chemical reactions in miniature apparatus with small quantities. **m. analysis.** The qualitative or quantitative analysis of small amounts of substances, *e.g.,* of the order of 10 mg. or less. Qualitative methods are based on spot, colour or microscope tests, q.v.; quantitative methods are usually small-scale adaptations of existing macro-methods.

microchemistry. (1) Microscopical chemistry. Chemical investigation by means of the microscope, especially the performance of chemical

reactions on a microscope slide and the observation of resulting precipitates or colors This requires only minute quantities of substances (2) The qualitative and quantitative reactions performed with small quantities (micrograms and microliters), using small apparatus (*e g* a capillary tube for burette)

microcidin A surgical antiseptic consisting of sodium-β-naphtholates and phenates

microcline Amazonite

micrococcus A minute spherical or round bacterium

microcosmic salt $NaNH_4HPO_4 4H_2O$ Phosphor salt Acid sodium ammonium phosphate, used in blow-pipe analysis for bead tests (q v) It occurs in blood, and natural waters

microcoulomb One-millionth part of a coulomb

microcrith An obsolete term for the weight of a hydrogen atom

microcrystalline Cryptocrystalline Crystallizing in minute crystals

microfarad One-millionth part of a farad, the ordinary measure of electrostatic capacity

microfilm A photographic film on which is reproduced printed matter on a greatly reduced scale In this way the contents of whole libraries can be reproduced and stored in a comparatively small space The m are read by projection on to a large screen

microgram Gamma, γ, the one-millionth part of a gram, a measure in microanalysis

micrography (1) Photomicrography (2) The measurement of physical properties with the aid of the microscope

microhm One-millionth part of an ohm

microlamp (1) A lamp used as an illuminator for microscopes (2) Any small artificial source of light

microline $K_2O,Al_2O_6,6SiO_2$ A vitreous yellow mineral

microliter Lambda, λ, the one-millionth part of a liter, a measure in microanalysis $1\lambda = 1\ mm^3$

microliths Very small crystals ($\frac{1}{1000}$ inch) in microscopic sections of rocks and slags

micromanipulator The attachments to the microscope stage consisting of controls and levers which enable one to manipulate an object while under observation, *e g* , for dissections, injections, etc

micromeritol An alcoholic extract of yerba buena

micromerol $C_{33}H_{50}O_6 = 480\ 43$ A monobasic alcohol from *Micromeria chamissonis*, a Labiatae

micrometer (1) Micron (2) An instrument for measuring small lengths or objects under the microscope, *e g* , the extension or expansion of cement or iron bars, the size of bacteria **m caliper** An instrument for measuring with an accuracy up to $\frac{1}{10}$ mm

micromicron μμ(mu-mu) = the one-millionth part of a micron $= 10^{-12}$ meter $= 10^{-9}$ mm = 10λ = 10 x-units (See *magnitudes*)

micromillimeter Same as micron = one-thousandth part of a millimeter

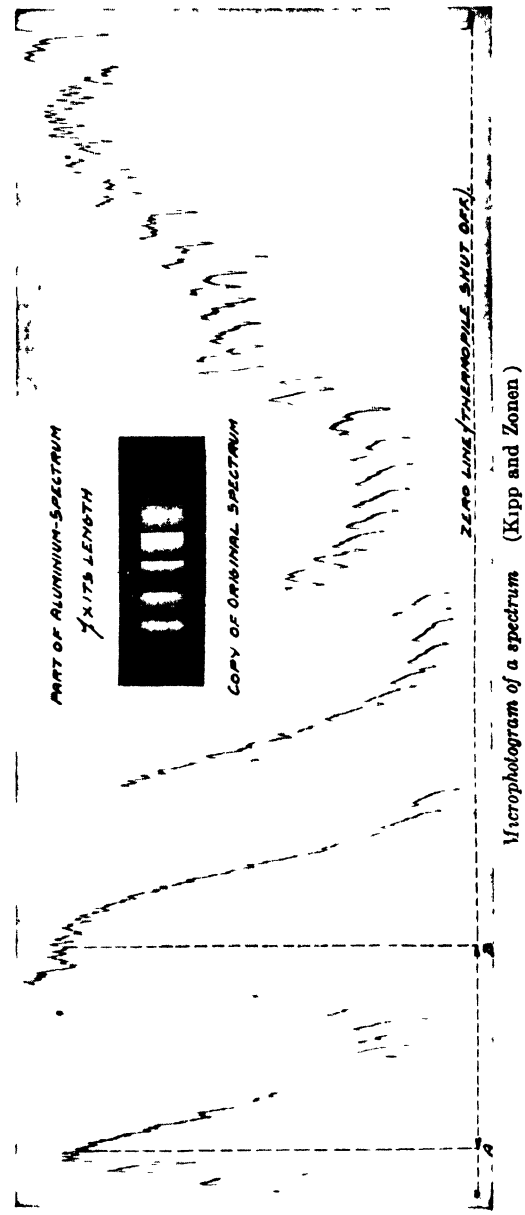
micron (1) μ = mu, or *m*μ A unit of length equal to one-millionth part of a meter, or one-thousandth part of a millimeter **micro-** See *micromicron* **milli-** See *millimicron* (See *magnitudes, amicron, submicron, ultramicron*) (2) A colloidal particle whose size ranges from 0 2 to 10μ The range is

micron	10 to 0 2μ, or 10^{-3} to 2×10^{-4} cm
submicron	0 2μ to 5mμ, or 2×10^{-5} to 10^{-7} cm
amicron	less than 5mμ, or 10^{-7} cm

m of mercury The pressure exerted by a column of Hg 1μ high, a unit of high vacua 1μ Hg = 0 001 mm Hg = 1 333 bars = 0 000,001,3 atm

microorganism Any minute animal or plant, visible only through a microscope

microphone An instrument for intensifying or transmitting sound by means of electrical impulses



microphotogram The record made by a microphotometer

microphotograph (1) A photograph reduced in scale Cf *photomicrograph* (2) Is microphotogram

microphotometer An instrument to measure the intensity of spectral lines by determining

the density of their photographic images over small areas It consists of a lighting system driving mechanism, photoelectric cell, and a galvanometer which magnifies greatly any change in the intensity of the photographic image and thus produces automatically a microphotogram on a sheet of light-sensitive paper (see figure)

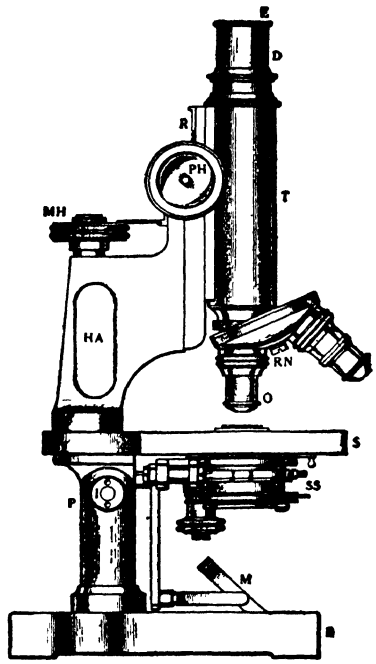
microporous Having openings or cavities of microscopic size **m rubber** See *mipor rubber*

micropolariscope A microscope with polariscope attached, used in the study of minerals and crystals

microreaction A chemical reaction performed under the microscope with minute amounts of reagents Used for the visual identification of elements or ions by means of their characteristic crystalline precipitates Cf *spot analysis*

microsal A mixture of copper carbonate and crude sulfonephenolic acids, used as disinfectant

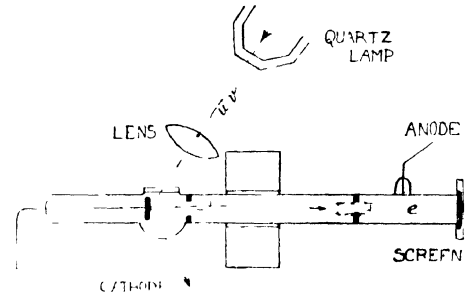
microscope An optical instrument consisting of objectives and eyepiece that magnifies minute objects for visual inspection or photographic record by direct illumination Normally the lower limit of visibility is 0 10μ



Microscope

E = ocular or eyepiece
O = objective
RN = revolving nosepiece
PH = pinion head (adjustment of focus)
MH = micrometer head (fine adjustment)
S = stage
SS = substage with diaphragm and condenser
M = mirror

binocular- A m having two eyepieces, which used simultaneously, produce a perspective effect of the object examined **compound-** An ordinary m , enlarging from 30–1000 diameters **electron-** A device analogous to an ordinary microscope, in which a beam of electrons replaces the source of light and magnetic condensers replace the lenses, the image is rendered visible by projection on to a fluorescent screen Magnifications of up to 100,000 are obtainable Cf *Kikuchi lines* **fluorescence-** A m in which the illumination is filtered ultraviolet light, used to study fluorescence (q v) phenomena Cf *ultraviolet*



Electron microscope

m **polarizing-** A m in which the object is on a rotating stage between crossed nicols **ultra-** A m in which the object is indirectly illuminated, *e g* , a thin layer of a colloidal solution is illuminated at right angles to the line of sight, and the colloidal particles appear as bright points on a dark field The lower limit of visibility is 5mμ **ultraviolet-** A high-power m in which an ultraviolet ray of few or single wave-length is the illumination Objects may be enlarged from 1000 to 6000 diameters The lower limit is 30$\mu\mu$ (3×10^{-5} cm or 10^{-6} inches) Cf *fluorescence m* **m test** Microreaction

microscopic Visible under the microscope, lower limit, about 0 10μ **a-** Invisible under the ordinary microscope **sub-** Amicroscopic **ultra-** Recognizable with the ultramicroscope, lower limit, about 5mμ Cf *micron*

microscopy (1) The art and science of the optical enlargement of objects, and their photography (2) The application of the microscope to useful ends **fluorescence-** See *fluorescence*

microspectroscope (1) A microscope with spectroscope attached, used for a study of the absorption spectra of tissues (2) A spectroscope with microscope attached, used for a study of the structure of spectral lines

microtome An instrument for cutting thin sections of materials and tissues for microscopic examination

micro-unit A unit of small measurement, usually the one-millionth part, to which micro- is prefixed It is characterized by a Greek letter, as, γ, λ, σ for microgram, microliter, microsecond, respectively

microvolt The one-millionth part of a volt

midrol Iodomethylphenylpyrazolone, mydrol Colorless crystals soluble in water, used in medicine as a mydriatic

miemite $CaCO_3 MgCO_3$ A vitreous, yellow-brown mineral

Miers, Sir Henry 1858–1942 A British chemist, noted for his work on mineralogy and crystallography

Miescher pipette A small tube used for diluting blood specimens for hemacytometers

mignonette oil Reseda oil

migrainin A proprietary mixture of 85 % antipyrine, 9 % caffeine, and 5 % citric acid, used medicinally for headaches

migration A movement or change of place, such as the m of ions in an electric cell **atomic-** See *rearrangement*

m tube An H-shaped glass vessel with electrodes On filling this tube with a salt solution adding a suitable indicator, and passing an electric current through the solution, the migration of the ions is illustrated by the progress of the color reaction **m velocity** The velocity with which ions move through a solution during electrolysis (See *transport numbers*) They are related to the absolute ionic velocities, (expressed in cm per sec per dyne) Thus, abs velocity = $10^8 \times$ migration velocity/96 000 Cf *mobility*

mikro- Micro-

mikrobe See *microbe*

mikrobin Sodium p-chlorobenzoate A preservative for wine or cider

mil (1) ml The one-thousandth part of a liter, 1 mil = 1 000028 cc This term is used in the British Pharmacopoeia (millliter) but was discontinued in the U S P X in favor of 1 cc (2) A wire measurement, equal to $\frac{1}{40}\frac{1}{00}$ inch = 25 4001 microns

milammeter Milliammeter

milarite $HKCa_2Al(Si_2O_3)_{12}$ A native, potassium, calcium aluminum silicate, colorless or greenish, brittle, hexagonal prisms

mile A measure of length, 1 mile = 1 60935 km = 1609 35 meters (1 mile = 5280 feet = 1760 yards = 80 chains) **admiralty-** 6080 ft **nautical-** 1 853 km = 1853 25 m = 6082 66 feet = 80 fathoms **geographical-** Nautical mile

milk (1) The opaque secretion of the mammary glands, an important food A white emulsion d 1 029–1 039 containing (averages, in 10 × %)

Milk of the	Water	Proteins	Fat	Sugar	Salts
Dog	754 4	99 1	95 7	31 9	7 3
Cat	816 3	90 8	33 3	49 1	5 8
Goat	869 1	36 9	40 9	44 5	8 6
Sheep	855 0	57 4	61 4	39 6	6 6
Human	875 5	12 5	35 0	75 0	2 0
Cow	871 7	35 5	36 9	48 8	7 1
Mare	900 6	18 9	10 9	66 5	3 1
Ass	900 0	21 0	13 0	63 0	3 0
Pig	823 7	60 9	64 4	40 4	10 6
Elephant	678 5	30 9	195 7	88 5	6 5

acid of- Lactic acid **butter-** Milk from which the fat has been removed **certified-** A good quality milk, which has been chemically and bacteriologically tested, and contains but few bacteria **condensed-** Milk from which some water has been removed and to which sugar has been added **fermented-** Kumyss **homogenized-** A milk which has been re-emulsified (*e g*, after pasteurization) or treated so that the fats do not separate into cream **modified-** A cream which is diluted with a lactose solution, used for infant feeding **pasteurized-** A milk which has been heated at 60°C for 30 minutes **skimmed-** Milk from which the separated cream has been removed **sterilized-** A milk that has been heated at 100°C for 45–60 minutes **vegetable-** An emulsion of fats derived from the soya bean, used extensively in China for beancakes or cheese-like foods

m extract A condensed milk, in which the casein has been partly peptonized **m fat** The total fats obtained from milk **m powder** A milk that has been evaporated and powdered **m scale** A white opal strip which runs the length of a burette or other graduated glass instrument and enables accurate meniscus (q v) readings to be obtained with ease **m serum** Whey **m stone** A flint whitened by fire **m sugar** Lactose **m test bottle** A graduated centrifuge tube, used in the determination of the fat-content of milk (see figure) **m weed** Silkweed

(2) Magma An emulsion or suspension

m of almonds An emulsion of 6 % almond oil with acacia, in water, used in pharmaceutical preparations and cosmetics **m of asafoetida** An emulsion of 4 % asafoetida in water, used medicinally as a sedative and carminative **m of barium** A suspension of barium hydroxide in water **m of bismuth** Magma bismuthi, bismuth magma A suspension of bismuth subnitrate in water, used medicinally **m of lime** A suspension of calcium hydroxide in water **m of magnesia** Magma magnesia A suspension of 7 % magnesium hydroxide in water, used medicinally as an antiacid for gastric disturbances **m of sulfur** Precipitated sulfur

Milk test bottle

milky Having a flat, white or opaque appearance **m quartz** A variety of quartz having a milk-like color and greasy luster

mill (1) A crushing, grinding, or pulverizing apparatus (2) An establishment for reducing ores by mechanical means (3) An establishment in which grinding, crushing, or powdering is done, as paper mill, flour mill etc (4) The equipment of a rolling mill, hence, a steel plant **assay-** A small mechanical crusher for the laboratory **ball-** A grinding apparatus in which iron or quartz balls are used for powdering **drug-** A laboratory apparatus for grinding drugs or seeds **pebble-** Ball mill **porcelain-** A laboratory machine for grinding wet or dry chemicals or bacteriological materials **m iron** A pig iron suitable for puddling or for the basic open-hearth process

millboard Board made from paper-refuse

Miller, William Lash, 1866–1940 A Canadian chemist, noted for his study of bios and physical chemistry **M indices** See *atomic planes*

millerite NiS Nickel pyrites A native nickel sulfide

millet A small-grain, edible cereal, cultivated on dry, sandy soils, *Setaria italica*, a Gramineae

milli- A prefix derived from the Latin, indicating one-thousandth

milliammeter An amperemeter for measuring one-thousandth of an ampere

milliampere One-thousandth part of an ampere

millångström λ The one-thousandth part of an Ångstrom unit, λ = 0 1μμ = 10^{-11} cm

millibar One-thousandth part of a bar

milligram mg A unit of weight equal to the one-thousandth part of a gram 1 mg = 0 01543 grains **m atom** mg at The number of milligrams of an element, divided by its atomic weight, used in the analysis of sea water **m per cent** mg - % The concentration of a solution expressed in mg per 100 cc

milligramage A unit of radioactive dosage the amount of radium exposure produced by 1 mg radium in one hour

milligram hour Milligramage

Millikan, Robert Andrews 1868– An American physicist, noted for his researches on electric phenomena, electrons, x-rays and radiation **M 's rays** Cosmic rays A high-frequency radiation from the cosmos, which penetrates the atmosphere and upper crust of the earth Its origin is at present thought to be the interstellar space Cf *mass-energy cycle*

millilambert A unit of illumination, equal to 0 929 lumens emitted per square foot

milliliter Same as ml (Cf *cc*)

millimeter mm = The one-thousandth part of a meter

millimicron $m\mu$ = The one-millionth part of a millimeter, the one-thousandth part of a micron, cf. $\mu\mu$ = micro-micron

millimol The one-thousandth part of a gram-molecule (mol)

milling The operation of crushing, grinding, or powdering

millinormal A solution having one-thousandth part of the concentration of a normal solution

million. 10^6 or 1,000,000 One thousand thousands

milliphot. A unit of illumination equal to one-thousandth part of a phot = 0 929 foot candle

Millon's base A yellow powder [probably $HO(Hg_2O)NH_2\,H_2O$ or $(HOHg)_2NH_2OH$] produced from a solution of mercuric oxide in ammonium hydroxide **M 's reagent** A reagent for the detection of proteins made by dissolving mercury in twice its weight of concentrated nitric acid and diluting with twice the volume of water, originated in 1849 by N A E Millon, a French chemist **M 's test** An intense, red precipitate or color is produced in the presence of proteins by warm Millon's reagent

millstone Burstone A hard stone used for grinding cereals, it usually consists of a coarse sandstone with fine quartz inclusions

milorganite An organic fertilizer prepared in Milwaukee by the dehydration of sewage A brown granular powder resembling coffee grounds, free from bacteria and seeds, and containing 5 4 % N and 3 % H_3PO_4

milori blue A pigment similar to soluble Prussian blue, but having a red tint, prepared by the oxidation of a paste of potassium ferrocyanide and ferrous sulfate

mimetite $PbCl_2\,3Pb_3(AsO_4)_2$ Mimetisite A native lead chloride and lead arsenate

mimosa bark The dried bark of *Acacia mimosa*, a Leguminosae It contains an astringent principle used in tanning

min. ℿ An abbreviation for minim

mine The subterranean workings for minerals, coal, or ores, cf *quarry, outcrop*

mineral Any non-organic or fossilized organic substance found in nature Minerals have a definite chemical composition and are formed by inorganic reactions They are classified according to their chemical compositions, or to their forms of physical crystallization **Ethiops-** Black mercuric sulfide with some free Hg and S **m acid** An inorganic acid **m adhesive** Sodium silicate **m alkali** An inorganic base, *e g*, NaOH, $Ca(OH)_2$ **m blue** (1) A mixture of ferriferrocyanide with calcium sulfate or barium sulfate (2) A blue copper or tungsten ore **m butter** Antimonous chloride **m caoutchouc** Alaterite, helenite, bitumen elastic A plastic type of bitumen **m carbon** Graphite **m chameleon** Potassium permanganate **m charcoal** An amorphous coal having a distinct vegetable structure which occurs as thin layers in bituminous coal See *coal* (fusain) **m coal** Fusain **m cotton** M wool **m dye** An inorganic pigment **m fat** Petrolatum **m green** Copper carbonate **m jelly** A semi-solid mixture of hydrocarbons, as vaselin, solid petrolatum **m oil** Paraffin oil, or its homologs **m oils** An oil obtained from inorganic matter, as petroleum and its products **m paint** A pigment derived from a colored mineral **m pigments** A native colored ore, or any artificial inorganic coloring matter **m pitch** Asphalt **m purple** A red iron oxide pigment, or ochre **m resin** A hydrocarbon mineral, such as asphalt, bitumen, copal **m rubber** Gilsonite **m separating fluid** See *density fluid* **m streak** The characteristic colored streak produced when certain minerals are rubbed on a porcelain plate **m tallow** Hatchettenine **m water** A natural water containing sufficient salts or gases in solution to give it certain properties and taste (see *water*) *artificial-* A solution of certain salts in carbonated or distilled water **m wax** Ozocerite **m white** Pearl hardening A pure form of natural calcium sulfate, used as a loading in paper, etc **m wool** Mineral cotton A mass of finely interlaced filament produced by suddenly cooling molten slag Used as a filling material for walls and coverings for steam pipes **m yellow** Lead oxychloride

mineralization The process of replacing organic constituents by inorganic matter *e g*, in fossilized plants and animals Cf *petrifaction*

mineralize Petrify

mineralac A trade name for asphalt solution used for insulating cable joints

mineralography (1) The descriptive branch of mineralogy (2) The study of minerals by microscopic methods, and the recording of their structures by photographs of thin sections of the polished and etched minerals

mineralogy A branch of science dealing with the occurrence, description, mode of formation and uses of minerals

miner's inch An arbitrary measurement of water, which is generally fixed as that quantity of water which will flow through a square inch hole through a two inch plank, the water standing six inches above the top of the hole This quantity of water amounts to 2274 cubic feet in 24 hours (= 1½ cubic feet per minute)

miner's lamp A lamp used by miners oil lamps, carbide lamps Davy lamp, electric cap-lamps, or flame-safety lamps

minetisite Mimetite

minim ℿ = min A unit of volume in the English system 1 minim = 0 0616 cc , 1 min

= $\frac{1}{8}\frac{1}{6}$ part of a fluid dram **U S -** 0 9606 imperial m = 0 9483 grain H_2O at 62°F

minimal Smallest quantity

minimum The smallest amount or the lowest value or limit

mining The processes by which useful minerals are obtained from the earth's crust, both by surface mining (from quarries) and by underground mining (from mines) **m engineering** The art and science of excavating, working and controlling the technical processes of mines including branches of civil, electrical, mechanical, and metallurgical engineering

minioluteic acid $C_{16}H_{26}O_7$ = 330 2 A dibasic acid from the mould fungus *Penicillium minioluteum*

$$Me(CH_2)_9CH(CO)COH(COOH)CH\ COOH$$
$$\text{——————}O\text{——————}$$

minium Red *lead oxide*, Pb_3O_4 Originally the term for cinnabar, but now applied to its chief adulterant, red lead Cf *sandix*

minivalence The lowest valency of an element, as shown by its position in the periodic system

mink fat The soft fat from *Putorius lutreula* White solid d 0 941, m 36 5, n_D 1 4608

mint Mentha (q v) **horse-** Monarda **marsh-** Marshmint **mountain-** Calamint **pepper-** Peppermint **spear-** Spearmint

minulite The mineral $KAl_2(OH,F)(PO_4)_2 \cdot 3\ 5H_2O$ from Western Australia

minute (1) Any particularly small object (2) A unit of time, the sixtieth part of an hour **m glass** An 8-shaped sealed glass vessel, on a base It is filled with fine sand which flows in a given time, from the upper to the lower compartment

Miocene The geological epoch (q v) between the Eocene and Pliocene periods

miostagmin reaction Ascoli reaction The lowering of the surface tension of diluted blood-serum which results from the antigen-antibody reaction and is measured with Traube's stalagmometer

miotic Myotic

mipor Microporous **m rubber** A soft rubber, penetrated by pores of about 0 0004 mm average diameter Used in filter-presses **m scheider** A diaphragm of m rubber used in accumulators and batteries

mirabilite A native sodium sulfate, Na_2SO_4, H_2O

miramant A tungsten-molybdenum alloy, used in cutting tools

mirbane oil Nitrobenzene

mirror A highly-polished surface that reflects light, made of polished metal, (nickel or its alloys) or glass with a metal backing (mercury, tin) **concave-** A)-shaped mirror **convex-** A (-shaped mirror **plane-** A perfectly flat mirror

mirrorstone (1) Mica (2) Muscovite

misce The Latin term for mix

mischmetall (1) An impure form of selenium (2) An unseparated reduction product from a natural mixture of the rare earths It contains a mixture of rare earth metals (3) Commercial cerium A mixture of 40-75 % Ce with varying amounts of La, Nd, Pr, etc and sometimes 1-5 % Fe, used for pyrophoric alloys Cf *Auer metal*

mischzinn [German, mixed tin] An alloy o 54 4 % Sn, 41 9 % Pb and 3 6 % Sb, used fo the preparation of solders

miscibility The ability of certain liquids to mi with each other in all proportions **m gap** The temperature range in which certain liquid which are normally miscible will not mix

miscible Capable of mixing or dissolving in al proportions **im-** Not able to mix

miso A fermented soya-bean paste used as food Cf *kogi*

mispickel $FeS_2\ FeAs_2$ A native iron sulfid and arsenite

mist Fog Cf *colloidal systems* **m tree** Chionanthus

mistletoe The leaves and young twigs o *Phoradendron flavescens*, used, as a fluid extract as antispasmodic and narcotic Cf *viscum*

mistura The Latin term for mixture, used in the U S Pharmacopoeia

mitogenic Describing radiations supposed t be emitted by living humans They have been associated with religious hysteria, cf *scotography*

mitosis Karyokinesis

mitragynine $C_{22}H_{30}O_4N$ = 389 25 Mitragyne An alkaloid in 100 b $_{3mm}$ 240, from *Mitragyne speciosa*, a Rubiaceae

mitraversine $C_{22}H_{36}O_4N$ = 392 30 An al kaloid, m 237, from *Mitragyne diversifolia* Rubiaceae

Mitscherlich, Eilhardt 1794–1863 A Germa chemist, noted for his research in mineralogica and organic chemistry **M desiccator** A desiccator, with side-tubes attached for evacua tion **M eudiometer** A closed glass buret with platinum electrodes at one end and glas stopcock at the other end **M law** (1) The law of isomorphism (q v) which is not rigidly correct The same number of atoms of simila elements combined in the same way produce an identical crystalline structure, which is therefore not dependent on the element contained in it, but on the mode of arrangemen of the atoms (2) The spectra of isomorphou substances are similar **M pulp** A strong sulphite wood pulp prepared by the M process in which wood chips are digested for 70–80 hr at 45 lbs /sq in pressure, the cooking liquor being circulated and heated outside of the digester

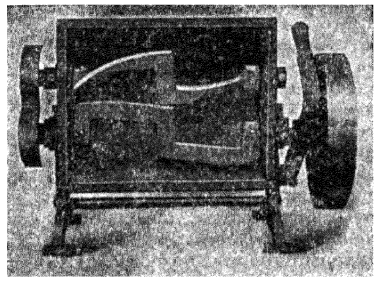
mitsubaene $C_{15}H_{24}$ = 204 19 A sesquiterpene from *Cryptotaenia japonica* (mitsuba-zeri) a Japanese Umbelliferae

mix (1) To intermingle (2) The physica mixture of substances from processing a applied to rubber, asphalt etc

mixed crystals A crystal of two isomorphou substances, both of which crystallize in the same system **m esters** An ester R—COO—R′, in which the two radicals R and R′ are differ ent **m ethers** An R—O—R′ ether in which the radicals R and R′ are different i e in oxide of two different hydrocarbons **m infection** The invasion by and growth of two o more microorganisms in the animal body **m ketones** A ketone of the type R—CO—R′ **m salt** A salt derived from a polyvalent acid in which the hydrogen atoms are replaced by different metals, as $KNaNH_4PO_4$ $KAl(SO_4)_2$ or $KNa(C_4H_4O_6)$ **m vaccine** A suspension of two or more microorganisms as bacteria in water, used medicinally for injections

mixer Equipment used for incorporating one or more material into another, it consists o

a steel bowl, with revolving mixing arms moving in opposite directions, which mix or knead pastes, semi-solid or solid materials. Cf. *mill* (see figure).



mixite. Cu_2O,As_2O_3,xH_2O with 13 % Bi_2O_3. An emerald mineral.

mixture. (1) Two or more substances which are mixed; but not chemically combined. Mixtures are non-homogeneous, and may be separated by mechanical means. **A.C.E.-** An anesthetic mixture: 1 part alcohol, 2 parts chloroform, 3 parts ether. **constant boiling-** A mixture of two liquids which, at a given pressure, distils unchanged, the boiling point remaining constant. Cf. *azeotropy*. Thus 20 % HCl and 80 % H_2O boil at 110°C., a *maximum* b.p. for these mixtures, while 95.6 % alcohol boils at 78°C., a *minimum* b.p. for alcohol-water mixtures. **freezing-** A mixture of salts and water or ice which produces low temperatures. **law of-** Law of *alligation*. (2) Mistura. A pharmaceutical preparation. **m. copaiba.** Lafayette m. A solution of 15 min. copaiva and 30 min. acacia in 1 fl. oz. of water.

M.K.S.-system. Meter-kilogram-second system. A technical system of measurements derived from the metric system: C.G.S-system (centimeter-gram-second). It was recommended by the International Electrotechnical Commission in 1938, as for certain purposes it is simpler than the C.G.S. system.

ml. Abbreviation for mil or milliliter (B.P. usage).

mm. Abbreviation for millimeter = $\frac{1}{1000}$ meter. **mm^2.** Abbreviation for square millimeter. **mm^3.** Abbreviation for cubic millimeter. **mm.** Abbreviation for millimoles.

$m\mu$. Abbreviation for millimicron, 10^{-9} m.

$\mu\mu$. Abbreviation for micromicron, 10^{-12} m.

mmm. An abbreviation for millimicron.

Mn. The symbol for manganese.

Mo. The symbol for (1) molybdenum; (2) monium.

Mo.) The abbreviation for $C_{17}H_{19}O_3N$ (morphine).

mobile. Changing or moving.

mobility. (1) The motion of atoms, molecules, ions, or colloidal particles. The mobility (α) of an ion in a liquid is given by the expression, $\alpha = 1.037 \times 10^{-6}\lambda n$, where λ is the equivalent conductivity, and n the transport number of the ion concerned. (2) The visible motion of colloidal particles and micro-organisms. Cf. *Brownian motion*.

mobilometer. A form of viscometer in which the time is noted for a disc to fall through a column of the liquid under investigation. It is used for measuring the consistency of oils, cream and liquid foods.

mocha. See *coffee*. **m. stone.** Moss agate.

mochyl alcohol. $C_{26}H_{46}O$ = 374.35. An alcohol, m. 234°C., from mochi, a Japanese birdlime.

mock gold. Iron pyrites. **m. lead.** Zinc blende. **m. ore.** Sphalerite. **m. silver.** Britannia metal. **m. vermilion.** Lead chromate.

mode. The actual composition of a substance (*e.g.*, rock) as compared with its norm (q.v.).

model. An arrangement by which an idea or concept can be visualized. **crystal-** A set of glass or cardboard forms or other devices, which illustrate the shapes of crystals. **space lattice-** A group of wire nets and balls which indicate the arrangement of atoms within a crystal. Cf. *space lattice*.

modification. (1) A slight alteration or change. (2) The conversion of cereal starch into a form in which it is readily acted on by proteolytic or amylolytic enzymes, as in the malting of barley.

modified soda. A mixture of sodium carbonate and sodium bicarbonate, used as a cleaning agent in laundries, dairies, the textile industries, and in the household.

modulus. The measure of a force or properties of mass or their effects. A constant which converts a proportionality into an equality. **bulk-** An approximate value, expressed in dynes per sq. cm., which lies between the limit of elasticity and the breaking strength of a material. **Young's-** The force (or longitudinal elasticity), in dynes per sq. cm., required to stretch a metal wire a length proportional to $M = \frac{FL}{al}$, where M is Young's modulus, F the whole force, a the area, L, the entire length of wire, and l, the extension.

m. of elasticity. The ratio of the magnitude of the stress to that of the corresponding strain. (*a*) If the strain is one of volume and the stress is pressure, P, the modulus of elasticity of volume (= k, bulk modulus) is $k = PV/v$, where v is the change in volume. (*b*) If the strain is a shear, the modulus of elasticity is the ratio: $n = T/\theta$ (shear modulus), where T denotes the shearing stress, and θ, the corresponding shear. **m. of rigidity.** Modulus of elasticity (*b*).

Mohr, Karl Friedrich. 1806–1879. A German chemist and physicist. He is considered by some as the originator of the conservation of energy law, prior to Mayer. **M. condenser.** A modified Liebig condenser. **M. pipet.** A small buret with tap, which is used as a pipet. **M. liter.** G.W.A. The space occupied by an amount of water at 17.5°C. having an apparent weight in air (brass weights) of 1000 grams. 1000 G.W.A. = 1002 milliliters. **M. salt.** $(NH_4)_2Fe(SO_4)_2.6H_2O$. Ferrous ammonium sulfate, used as a standard in volumetric analysis.

Mohs, Friedrich. 1773–1839. A German mineralogist. **M. scale of hardness.** The hardness of a mineral is gauged by its ability to scratch or be scratched by one of ten standard minerals:

1. talc	6. orthoclase
2. gypsum	7. quartz
3. calcite	8. topaz
4. fluorite	9. corundum
5. apatite	10. diamond

Each mineral in the scale is scratched by all below it. Cf. *abrasives*.

Moissan, Henri 1852–1907 A French chemist noted for his research on the production of artificial diamonds and gems, and on the isolation of fluorine **M furnace** A high-temperature electric furnace **M process** The production of metallic chromium by the reduction of chromic oxide with carbon in an electric furnace lined with calcium chromite

moistness The amount of liquid, generally water, held by a solid or gas Cf *wetting, adsorption*

moisture The wetness or dampness of a substance, the percentage of water contained in a substance

mol Mole A gram-molecule, or formula weight in grams The quantity of matter weighing M grams, where M is the molecular weight Thus, one mol water weighs 18 grams, two mols, 36 grams

molal (1) Molar Gram-molecular, or pertaining to mols, the molecular weight expressed in grams (2) Moles per weight, as in m solution **m conductivity** The conductivity between electrodes one centimeter apart of a solution containing one mol (gram-molecule) of the substance dissolved in one liter **m latent heat** Molecular heat of vaporization The quantity of heat in calories required per molecular weight to transform a substance from the liquid to the gaseous state **m surface** The area of a sphere of one mol of a substance **m solution** The concentration of a solution expressed in moles of solute per 1000 grms of solvent Cf *molar solution* **m volume** The volume occupied by one mol of a substance This volume is 22 4146 ± 0 0008 liters for an ideal gas under standard conditions **m weight** The molecular weight expressed in grams, a mol

molality *M* The concentration of a solution expressed in mols per 1000 gm of solution Cf *molal, molar solution*

molar (1) Molal (2) Referring to molecules in bulk, as distinguished from *molecular* (single molecules) and *molal* (a definite quantity) Cf *molecular, colloidal, molal, normal solutions* (3) Moles per volume, as in *m solution* **m solution** A solution which contains one mol of substance in 1000 cc of solution = M Thus

1 0M NaCl solution contains 58 5 gm per liter
0 5M NaCl solution contains 29 25 gm per liter
2 0M NaCl solution contains 117 0 gm per liter

It may or may not be identical with a *normal* solution (q v), or a *molal* solution

molarity M The concentration of a substance in one thousand cc of solution, expressed in mols Cf *molar, molal solution, concentration*

molasses Treacle The uncrystallizable syrup obtained on boiling down raw cane- or beet-sugar It contains 70 % of sugars Cf *affination*

mold Mould A variety of fungoid growth, usually filamentous, which grows on damp vegetable material Cf *mould* **slime-** Myxomycetes

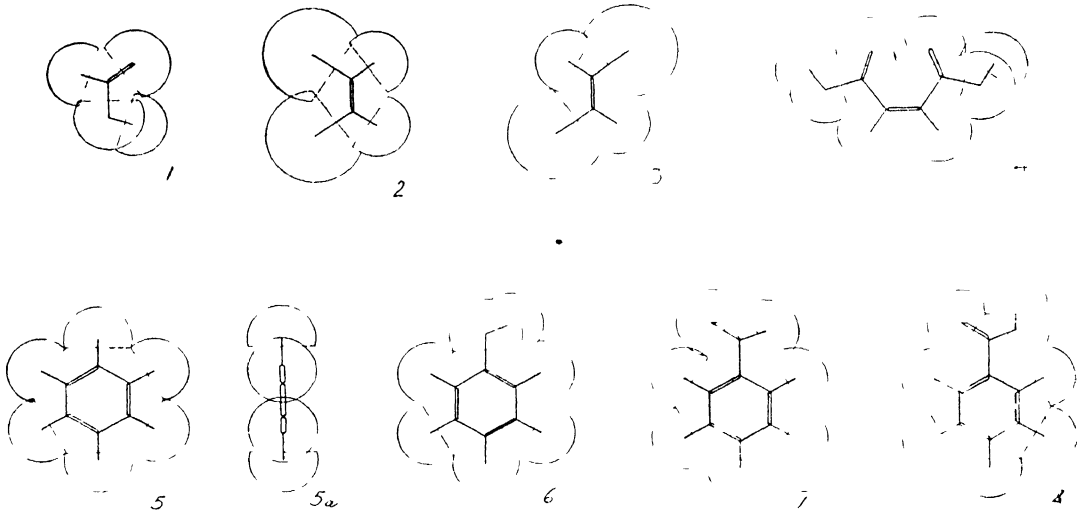
moldavium Virginium

mole Mol

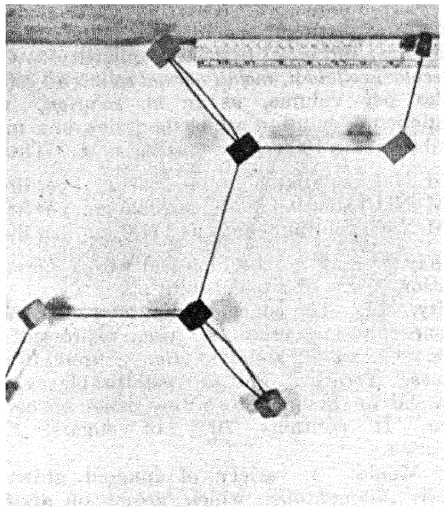
molecular Pertaining to single molecules Cf *molar, molal* **m association** Two or more molecules held by coordinate bonds, q v **m colloid** See *colloid* **m combination** See *combination* **m compound** Double salt **m conductivity** Molal conductivity **m conversion** See *rearrangement* **m depression** The lowering of the freezing point of a solution See *Raoult's Law* **m diagrams** Drawings to scale of a view of the m model They resemble structure symbols, but show the ionic and effective radii and the shape of the molecule **m diameter** The diameter of a molecule expressed in 10^{-8} cm and calculated either from (a) Sutherland's equation, (b) van der Waal's equation, (c) the heat of conductivity, (d) the

MOLECULAR DIAGRAMS

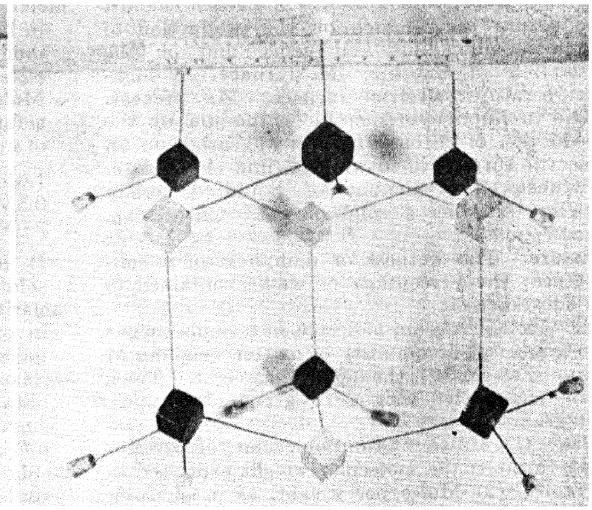
These are drawn to scale in Ångstrom units The HEAVY lines represent the bonds (cf *structure symbols*) or the vector force lines from the atoms The CIRCULAR lines are the effective radii around the atoms The DOTTED lines dissect the bonds at the atomic radii, thus 0 77 Å for C, 0 66 Å for N



Front views of 1 *formic acid*, H CO OH, 2 *cis-dichloroethylene*, CHCl CHCl, 3 *trans-dichloroethylene*, CHCl CHCl, 4 *maleic acid*, HO CO CH CH CO OH, 5 *benzene*, C_6H_6, 5*a* , *side view*, 6 *phenol*, C_6H_5OH, 7 *benzaldehyde*, C_6H_5 CO H, 8 *benzoic acid*, C_6H_5 CO OH



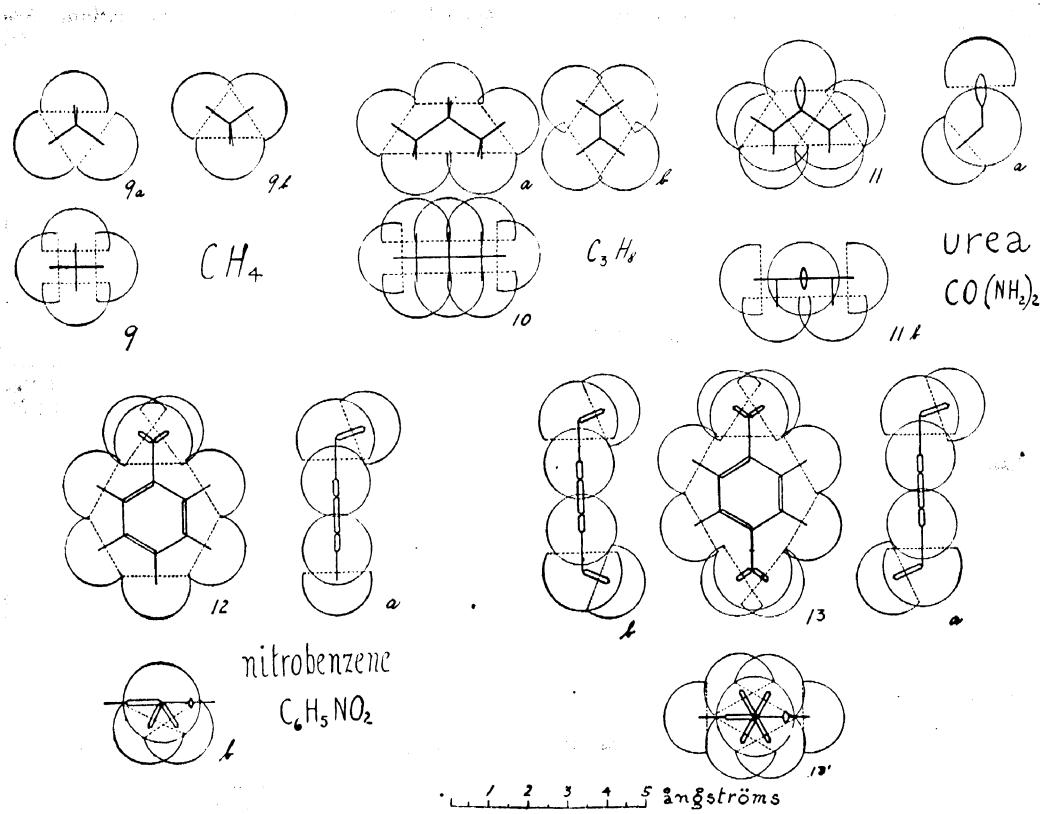
Hexamethylenetetramine



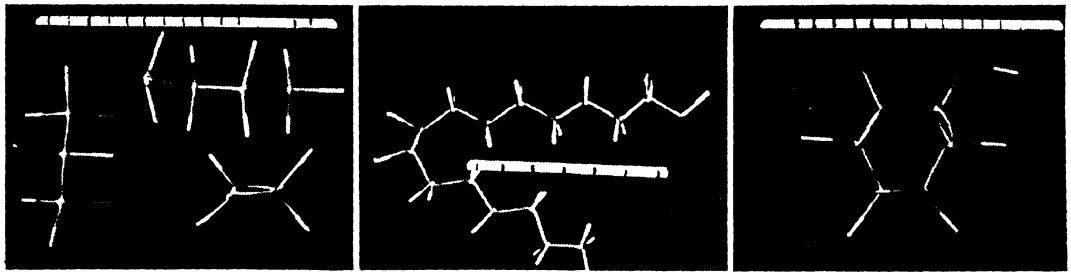
Oxalic acid

Molecular models (2).

Scale of models: 10 cm. per Ångström. (Note that the cubes representing atoms are located so that their corresponding faces are all parallel.)



views of: 9. *methane*, CH_4 *top view*, 9a. *front view*, 9b. *side view;* 10. *propane*, $CH_3.CH_2.CH_3$ *top view*, 10a. *front view*, 10b. *side view;* 11. *urea*, $NH_2.CO.NH_2$ *front view*, 11a. *side view*, 11b. *top view;* 12. *nitrobenzene* $C_6H_5.NO_2$ *front view*, 12a. *side view*, 12b. *top view;* 13. *para-dinitrobenzene*, $NO_2.C_6H_4.NO_2$ *front view*, 13a. *side view of trans-form*, 13b. *side view of cis-form*, 13. *top view of trans-form.*



Propane, Propylamine, Ethylene cis-oleic acid Phenol

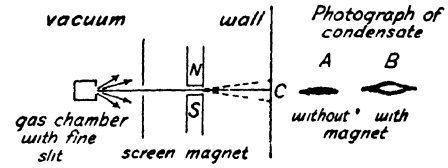
Molecular models (3)

Scale of models 2 cm per Ångstrom (Compare these wire models with the corresponding structure symbols)

specific heat at constant volume Some of the molecular diameters are, (Ångstrom units)

	(a)	(b)	(c)
hydrogen	2 40	2 34	2 32
helium	1 90	2 65	2 30
oxygen	2 98	2 92	—
nitrogen	3 18	—	—
mercury	—	3 01	—

See figures **m dispersion** M rotation **m. elevation** The raising of the boiling point of a solution See *Raoult's Law* **m equation** See *chemical equation* **m field** See *field* **m. film** A monomolecular layer, as produced in adsorption **m flow** See *flow* **m formula** A combination of chemical symbols from which the molecular weight of a substance can be obtained by the simple addition of the atomic weights of the constituents Cf *formula* **m free path** The average free path, L, of a molecule in a solution or gas It is calculated from (a) Boltzmann's equation, $L = \mu(0\ 3592\rho\Omega)$ or (b) Meyer's formula, $L = \mu(0\ 3097\rho\Omega)$, in which μ is the viscosity, ρ the density of the medium and Ω the molecular velocity **m frequency** A ratio obtained by $\nu = k(T_s/M\gamma^{\frac{2}{3}})^{\frac{1}{2}}$, where ν is the molecular frequency, T, the absolute temperature of the melting point of the substance, M, the molecular weight, γ, the molecular volume and k, a constant whose empirical value (Nernst) is $3\ 08 \times 12^{12}$ **m heat** The specific heat of a substance multiplied by its molecular weight **m heat of vaporization** Molal latent heat **m model** (1) A series of differently-sized balls, representing atoms, which are united to show the structure of a m (2) A series of cubes, representing atoms, having holes from the corners to the center into which fit wires that may be cut to suitable lengths (10 cm for 1 Angstrom unit) and united with other cubes to illustrate a molecule (3) A series of wires of suitable length (2 cm for 1 Angstrom unit) which are the vectors representing bonds, as in (2) (See figures) **m number** (1) A number, analogous to the atomic number, obtained by arranging the different molecules according to their molecular frequencies (2) The sum of the atomic numbers of the elements of a molecule, in a compound it is *even*, in a free radical it is an *odd* number Cf *combination* **m rays** A stream of molecules moving uniformly in a similar direction, obtained by the escape of vapor through an orifice into a vacuum, screening, and condensing the vapor on the wall of the vessel Such a beam of molecules may be influenced by electric and magnetic fields The velocity is calculated by $\alpha = \sqrt{2RT/M}$, and is about 2×10^4 cm for hydrogen at room temperature **m rearrangement** See *rearrangement* **m rotation** The specific rotation of a substance multiplied by its molecular weight **m solution** A true



Molecular rays

solution in which single molecules of the dissolved substance are moving in the dissolving liquid, cf *colloidal solution*, which consists generally of aggregates of molecules in the solvent **m solution volume** The difference between the volume of a solution containing 1 mol substance per liter, and that of 1 liter of the pure solvent **m velocities** The mean velocity, G, with which the molecules move It is proportional to the mean kinetic energy, and the pressure which the molecules exert on the walls of the vessels (cf *kinetic theory*) and is calculated from $G = W\sqrt{\frac{3}{2}} = 1\ 225W$ W is the most probable velocity obtained by the equation, $W = 15{,}800\sqrt{(T/m)}$ (cm /sec) in which T is the absolute temperature and, m, the molecular weight **m volume** The molecular weight, M, of a substance divided by its density D, hence, $MV = M/D$ In an ideal gas $R = 22\ 416 \pm 0\ 0008$ liter mole^{-1} See *parachor, volume* **m weight** M The relative mass of a molecule in relation to that of a hydrogen atom It is calculated by adding together the atomic weights indicated by the formula of the substance, or it may be determined by many chemical and physical methods, as, lowering of freezing point, raising of the boiling point, vapor pressure, conductivity or vapor density Cf *Landsberger, Sakurai-Landsberger*

molecule The chemical combination of two or more like or unlike atoms It has been defined as the smallest quantity of matter that can exist in the free state and retain all the properties of the original substance In noble gases and metals the molecule is identical with

the atom, *i e*, the molecules are monatomic Other gaseous molecules usually consist of two atoms, as O_2, Cl_2 All the molecules of all compounds contain two or more atoms Cf *additive, colligative, entropy, Sutherland's equation, molecules, kinetic theory, contraction* **activated-** A m with one or more excited atoms, *i e*, atoms with one or more electrons moving at a higher energy level It is indicated by a ′ or *, as Cl_2′ or Cl_2* **biatomic-** (1) A m of two atoms (2) An isosteric m having two atoms, the hydrogen atoms not being counted, as, O_2, N_2H_4, C_2H_6, CH_3F, CH_3OH **compound-** A m consisting of different types of atoms **elementary-** A m consisting of one type of atoms **excited-** Activated **gram-Mol isosteric-** A group of molecules having the same number of electrons, the same sum of atomic numbers and, sometimes, the same molecular weight, as CO_2 and N_2O, O_2 and HN NH, N_2 and CO **nonpolar-** q v **oriented-** q v **polar-** q v **saturated-** A molecule in which all valencies are satisfied **tetratomic-** (1) A m having four atoms (2) An isosteric m with four atoms, excluding the hydrogen, as, $(CH_3)_3N$ and $(CH_3)_3CH$ **triatomic-** (1) A m having three atoms (2) An isosteric m having three atoms, excluding the hydrogen atoms, as, $(CH_3)_2O$, $(CH_3)_2NH$ and C_3H_8 **unsaturated-** A m in which there are double and/or triple bonds between certain of the atoms

molecules (constants) (1) The number of molecules per gram-molecule (mol) is N = $6\ 06 \times 10^{23}$, (mean) Avogadro's number (2) The number of molecules of a gas per cc at 0°C and 760 mm pressure is, n = $2\ 70 \times 10^{19}$ Loschmidt number (3) The following are calculated constants for some molecules of gases

	H_2	O_2
mass of molecule (molecular weight)	2	32
velocity of molecule (average in meters per second at 0°C)	1859 m	465 m
mean free path (in mm)	965×10^{-7}	560×10^{-7}
collisions (millions per second)	17,750	7,646
diameter (in mm)	$5\ 8 \times 10^{-7}$	$7\ 6 \times 10^{-7}$
mass (in grams)	46×10^{-25}	736×10^{-25}
number of molecules in 1 cc	$3\ 8 \times 10^{19}$	$3\ 8 \times 10^{19}$

molions The supposed negatively-charged atomic groups of an ionized inert gas

moloxide An unisolated primary auto-oxidation product of one or more molecules of oxygen, added to an unsaturated organic compound

molybdate. A salt of molybdic acid The simpler salts have the formula, $M_2(MoO_4)$, or, $M_2Mo_2O_7$, corresponding with the chromates and bichromates, respectively A more complex salt is $M_6Mo_7O_{24}$, as in ammonium molybdate

molybdaenum, molybdan Early names for both native molybdenum sulfide and graphite, which were frequently confused

molybdenic Molybdic

molybdenite MoS_2 The white or green mineral sulfide of molybdenum

molybdenous A salt of divalent molybdenum, Mo=

molybdenum Mo = 95 95 A heavy metal, atomic number 42, belonging to the chromium group of the periodic system A gray metal, d 9 01, m 2535, b 5690, insoluble in water or alkalis It occurs in molybdenite, molybdite, wulfenite, and other rare minerals The metal is used in metallurgy and steel manufacture for crank-shafts and connecting rods, as a resistor, in heating devices and radio-apparatus, as wire, for vacuum tubes and contacts Its valency may be 2, 3, 4, 5, or 6, but the more common compounds are derived from divalent (molybdenous), trivalent (molybdic), and hexavalent (molybdates) molybdenum **m blue** A mixture of m dioxide and trioxide, $MoO_2\ 4MoO_3 \cdot H_2O$ **m chlorides** *di-* $MoCl_2$ = 166 9 Molybdenous chloride A yellow insoluble amorphous powder *tri-* $MoCl_3$ = 202 4 Molybdic chloride Red needles *tetra-* $MoCl_4$ = 237 8 Brown crystals *penta-* $MoCl_5$ = 273 3 Black crystals, d 9 5, m 194, b 268 **m hexacarbonyl** $Mo(CO)_6$ = 264 0 Colorless crystals **m hydroxide** (1) $Mo(OH)_3$ A black, insoluble powder (2) $Mo(OH)_5$ A brown, insoluble powder **m minerals** The principal ore of molybdenum is the sulfide, ores

molybdenite	MoS_2
molybdite	MoO_3
wulfenite	$PbMoO_4$
powellite	$CaMoO_4$
belonesite	$MgMoO_4$
koechlinite	$Bi_2(MoO_4)_3$

m orange A series of pigments formed by the co-precipitation of lead molybdate lead chromate and lead sulfate in varying proportions **m oxides** *di-* MoO_2 = 128 0 Bluish-red prisms, d 6 44, used as blue pigment in the textile industry *sesqui-* Mo_2O_3 = 240 0 Yellowish to black amorphous mass, soluble in HCl *tri-* MoO_3 = 144 0 Molybdic anhydride The most common oxide, white rhombic crystals, d 4 39, soluble in ammonia or strong alkalis Used as a reducing agent, and reagent for P_2O_5, As_2O_5, H_2O_2, aromatic oxycompounds phenols, and alcohols **m sulfides** *di-* MoS = 160 1 Molybdenite A black crystalline mass, d 4 80, insoluble in acids or water *tri-* MoS_3 = 192 2 Red brown crystals *tetra-* MoS_4 = 224 3 Brown crystals

molybdenyl (1) The divalent MoO_2 = radical (2) The tetravalent MoO ≡ radical **m dichloride** $MoO(OH)_2Cl_2$ or $MoO_2Cl_2\ H_2O$ **m tetrachloride** $MoOCl_4$ **m trichloride** $MoOCl_3$ Green, soluble crystals

molybdic Describing a salt of trivalent or hexavalent molybdenum **m acid** H_2MoO_4 = 162 0 Molybdic hydroxide Colorless needles, soluble in alkalis *hydrous-* $H_2MoO_4\ 4H_2O$ = 234 08 Yellowish, monoclinic crystals, d 3 124, soluble in ammonia or alkalis Used as a reagent, in the preparation of ammonium molybdate solution **m anhydride** MoO_3 See *molybdenum oxides* **m ochre** Molybdite

molybdite MoO_3 Molybdenum trioxide, molybdic ochre Occurring native as yellowish earthy or capillary tufted forms

molybdœna An obsolete term applied in confusion to both graphite and molybdenum sulfide

molybdyl Molybdenyl

molysite An incrustation of ferric chloride found in lava and near volcanos

moment The power to overcome resistance **magnetic-** The strength of a magnetic pole

multiplied by its length **m of force** Torque The effectiveness of a force in producing rotation around a center, measured in dyne-centimeters (the force multiplied by the distance from the center) **m of inertia** See *inertia, momentum*

momentum The force effect of a moving body (inertia), measured by multiplying its mass by its velocity Quantity of motion = MV = MLT^{-1} (M-mass, V-velocity, L-length, T-time) **angular-** Spin

momordicin Elaterin

mon-, mono- A prefix derived from the Greek, indicating "one"

mona wax Peat wax

monacetin $C_5H_{10}O_4$ = 134 1 Glyceryl monoacetate $CH_2OH\ CHOH\ CH_2OOCCH_3$ A colorless liquid d 1 221, soluble in water, alcohol or ether, b $_{2-3mm}$ 131 Used as a solvent for basic dyes

monacid A compound having one hydroxyl group that can replace the hydrogen of an acid, thus monacid bases, KOH or NaOH, monacid alcohols MeOH or EtOH

monad A monovalent element or radical, atom or atomic group, *e g*, Na—, NH_4—, CH_3—, or —COOH Cf *dyad, polyad*

monamide An amide containing one amido group

monamine An amine containing one amino group

monarda American horsemint, bee-balm The dried herb of *Monarda punctata*, a Labiatae, used medicinally **m oil** An essential oil from m , of thyme odor, d 0 930–0 940, containing thymol and cymol

monardin A thymol-like terpene from horsemint oil

monascin $C_{24}H_{30}O_6$ = 414 2 A red pigment produced by the growth of the fungus *Monascus purpureus* on rice, m 137, insoluble in water

monastral blue A phthalocyanin, (q v) containing a copper atom It is a blue pigment and has a greater combined resistance to light, heat, reagents, etc than any other blue dye known

monatomic (1) Monad Describing (2) a molecule consisting of one atom, (3) an atom or atomic group having one free valency

monazite A native phosphate sand of the rare earths, especially Ce, La, and Th, found in India and Brazil Used in the manufacture of thorium and cerium compounds for Welsbach burners, and in the production of pyrophoric alloys

Mond, Ludwig 1839–1909 An English chemist (naturalized German) **M gas** A process for manufacturing a fuel gas by the passage of superheated steam over coal **M process** A method for separating nickel and copper by means of carbon monoxide, the volatile nickel carbonyl, $Ni(CO)_4$, is formed, and is subsequently decomposed by heat Cf *Oxford process*

monel metal A native alloy of 67 % nickel, 28 % copper, 1–2 % manganese and 1 9–2 5 % iron, d 8 82, m 1160–1360 It is very resistant to corrosion, and is used in chemical plant

monesia bark The bark of *Chrysophyllum glycyphloeum*, a Brazilian tree, used medicinally as a tonic and astringent

monesin $C_{32}H_{54}O_{16}$ = 694 5 A saponin-like glucoside from monesia bark

mongumic acid An acid obtained from monguma bark, a bark from a Madagascan tree

monistic Pertaining to singleness **m compound** A substance which does not ionize in solution, as, sugar

monium Victorium (q v) A supposed rare earth element discovered in 1898, which proved to be a mixture of rare earth metals

monks hood Aconite

mono- Mon-

monoacetin Monacetin

monoacid A base or alcohol with one hydroxyl group which can replace one hydrogen atom of an acid

monoamino acid An organic acid of the type, NH_2—R—COOH

monoatomic Describing (1) a base or alcohol containing one replaceable hydroxyl group, (2) an acid containing one replaceable hydrogen atom, (3) a molecule consisting of one atom

monobasic Describing an acid having one hydrogen atom which can be replaced by a metal or positive radical

monobromated A compound having one bromine atom **m camphor** See *camphor*

monobromethane (1) Ethyl bromide (2) Methyl bromide

monobromo- Describing a compound which contains one bromine atom **m acetanilide** Antisepsin **m isovaleryl urea** Bromural

monobutyrin $C_7H_{14}O_4$ = 162 1 Glycerol monobutyrate $C_3H_7COOC_3H_5(OH)_2$ Colorless liquid, d 1 008, b 271 which is produced by lipolytic action

monochloro- Describing a compound having one chlorine atom **m amine** NH_2Cl = 51 5 An intermediate product in the preparation of hydrazine from chlorine and ammonia It is an unstable, pungent liquid **m ethane** Ethyl chloride **m methane** Methyl chloride

monochroic Monochromatic

monochromatic Monochroic A substance having but one color, more accurately, represented by one wavelength only **m analysis** The measurement of colors by mixing white light with light of a pure spectral hue, the hue and whiteness only vary **m illuminator** M lamp **m lamp** A gas flame colored yellow with sodium compounds, or a spectrum apparatus provided with a narrow slit for isolating a ray of one wavelength, used as a source of light for a polariscope or for irradiation

monoclinic See *crystal systems*

monoethanol A compound having one ethanol radical, —$CH_2\ CH_2OH$ **m amine** See *ethanolamine*

monoethyl Any compound containing one ethyl radical

monoethylin See *ethylin*

monofilm Monolayer

monoformin $C_4H_8O_4$ = 120 1 Glycerylformate, $C_3H_5(OH)_2\ COOH$ An oily liquid, b 165

monogenetic (1) In biology pertaining to non-sexual reproduction (2) In industry pertaining to dyestuffs which produce only one color on textiles, as compared with polygenetic dyes

monoglyceride A glyceride, (q v) containing one acid molecule

monohydrate A crystal containing one molecule of water of crystallization **m crystals** Sodium carbonate $Na_2CO_3\ H_2O$ Used as cleansing agent in laundries, dairies, and the household

monohydric Describing a compound or acid containing one replaceable hydrogen atom

monolayer Monofilm A mono-molecular layer Cf *adsorption orientation*

monolupine $C_{16}H_{22}N_2O$ = 258 2 An alkaloid from *Lupinus caudatus* (0 45 %) A yellow glass, b $_{4mm}$257, $[a]_D$ −40 81° soluble in alcohol It is related to anagyrine

monoleate A combination of a base with one oleic acid radical

monometric Isometric

monomolecular Pertaining to one molecule **m layer** A layer one molecule thick, cf *zone orientation, adsorption* **m reaction** A reaction concerning one molecule only, such as, decompositions or dissociations, intramolecular oxidations and reductions, intramolecular rearrangements Cf *reaction order* **m zone** See *zone*

monomorph Occurring in one crystal form only Cf *dimorph*

mononitraniline See *nitraniline*

mononuclear (1) In chemistry describing an aromatic compound having one ring of atoms (2) In biology a cell having one nucleus

monoolein $C_{21}H_{38}O_4$ = 354 30 Glycerol-*1*-monooleate, $C_{17}H_{31}COOCH_2CHOHCH_2OH$ White crystals, d 0 947, m 35, insoluble in water It has been synthesized from fats by pancreatic lipase

monopalmitate An ester, especially of glycerol, containing one palmitic acid radical only

monopalmitin $C_{19}H_{38}O_4$ = 330 3 **α-** Glycerol-*1*-monopalmitate, $C_{15}H_{31}COOCH_2CHOHCH_2OH$ White leaflets, m 77, soluble in alcohol **β-** Glycerol-*2*-monopalmitate $C_{15}H_{31}COOCH(CH_2OH)_2$

monophosphate A salt containing one phosphate radical

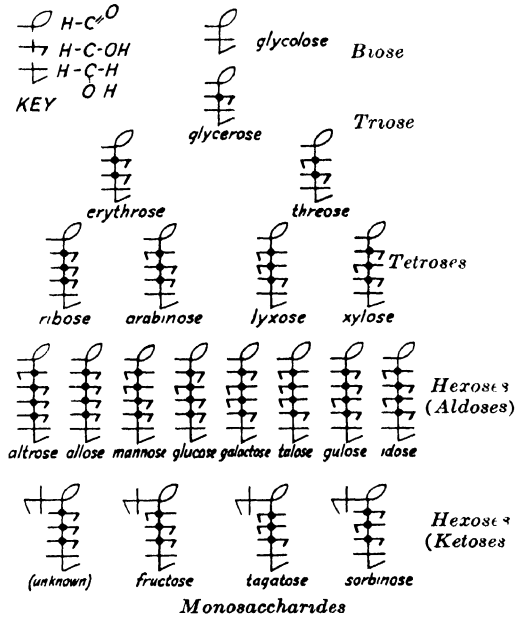
monopole soap A soap of highly sulfonated fatty acids

monopoly Control over the production and sale of an article or material Taking the world's production as 100 the commodities come nearest to being monopolized by the countries shown in the table Cf *trust, patent*

Commodity	*Proportion produced*	*Annual value in million dollars*
Helium	100 % by U S A	No sale
Radium	100 % by Belgium	6
Chilean nitrate	100 % by Chile	100
Natural camphor	95 % by Japan	7 5
Potash	95 % by Germany and France	75
Asbestos	91 % by British Empire	
Quinine	90 % by Dutch Indies	
Nickel	90 % by Canada	
Molybdenum	85 % by U S A	
Vanadium	78 % by Peru	
Iodine	80 % by Chile	4
Sisal	75 % by Mexico	15
Silk	75 % by Japan	270
Sulfur	71 % by U S A	
Coffee	65 % by Brazil	140
Antimony	66 % by China	
Manganese	64 % by Russia	
Petroleum	61 % by U S A	
Chromium	63 % by Rhodesia	
Rubber	55 % by British Empire	400
Gold	53 % by South Africa	
Copper	51 % by U S A	

monorefringent An isotropic solid or mineral

monosaccharide A hexose or pentose, in general an aldehyde-alcohol or ketone-alcohol cf *carbohydrates* There are



Monosaccharides

monose A hexose or pentose See *saccharides*

monosilane Silane

monostearin $C_{21}H_{42}O_4$ = 358 3 **α-** Glycerol-*1*-monostearate, $C_{17}H_{35}COOCH_2CHOH,CH_2OH$ White needles, m 73 5, insoluble in water **β-** Glycerol-2-monostearate, $C_{17}H_{35}COOCH(CH_2OH)_2$ White solid, m 80

monosulfide Containing one divalent sulfur atom, *e g* , FeS **m equivalent** A value of lime-sulfur solutions determined by titrating with iodine to disappearance of the yellow color It represents the S of calcium sulfide as distinct from the polysulfides

monotropitoside A primeveroside of methyl salicylate from *Monotropa hypopitys*, yellow birds nest, a Pyrolaceae It is probably identical with gaultherin

monotropic Describing a substance occurring in one crystalline form only **pseudo-** Describing a substance which occurs in one stable form only, as iodine chloride

monotype metal An alloy of Pb (80 %) Sb (15 %), Sn (5 %), used for making printing type

monovalent Describing an atom or radical having a valency of one

monovinyl acetylene Vinylacetylene

monox A mixture of silicon monoxide and dioxide, used as a thermal and electric insulating material

monoxide A binary compound containing one oxygen atom, as PbO, FeO, N_2O

monsel salt Ferric subsulfate **m solution** Liquor ferri subsulfatis A dark, reddish-brown liquid containing about 15 % iron, used medicinally as a styptic

montan wax A native hydrocarbon extracted from lignites Brown or white masses soluble in chloroform or benzene, used as a substitute for carnauba wax

montanic acid $C_{29}H_{58}O_2$ = 438 46 A monobasic acid, m 87, from montan wax

montanin A disinfectant consisting chiefly of hydrofluosilicic acid

montanite Bi_2O_3 TeO_3 $2H_2O$ A rare bismuth tellurate from Montana

montanyl alcohol $C_{29}H_{60}O$ = 424 26 Nonacosanol* White crystals, m 84 5, from beeswax, and *Parosela barbata*, a Leguminosae

monte-acid An acid elevator or acid pump for raising acids to the tops of towers by means of air pressure

montejus An apparatus for raising liquids by air pressure (acid egg or monte-acid)

month The twelfth part of a year, the period of revolution of the moon around the earth **anomalistic-** = 27 5546 days, or the time of revolution of the moon from one perihel to another **nodical-** = 27 2122 days, or the time of revolution of the moon from a node to the same node again **sidereal-** = 27 32166 days, or the time of revolution of the moon from some distant star back to that star **synodic-** = 29 5306 days, or the time elapsing from new moon to new moon **The** ordinary month

monticellite MgO CaO SiO_2 A native, calcium, magnesium silicate, belonging to the olivine group, and occurring in limestone in colorless or gray crystalline masses

montmorillonite (Mg Ca)O Al_2O_3 $4SiO_2$ nH_2O A rose-red mineral and acidic clay constituent, active in base exchange **calcium-** Fuller's earth **sodium-** Bentonite

montroydite HgO Native mercury protoxide

moonstone A variety of feldspar with a delicate, pearly opalescent play of colors, used as a gem

mora Mowrah

Moraceae A group of plants belonging to the Urticaceae, (q v), yielding important products (rubber, lac, hemp, timber, etc)

moradeine An alkaloid from the bark of the rubiaceous tree, *Pogonopus febrifugus* of South America Colorless prisms, m 195, soluble in alcohol or ether, used similarly to quinine

moradin A fluorescent substance from the bark of *Pogonopus febrifugus*, allied to scopoletin

morbific Producing disease

mordant A chemical used for fixing colors on textiles by adsorption Common mordants are the soluble salts of aluminum, chromium, iron, tin, antimony, and copper **m dye** An artificial or natural color for fibers which usually forms an insoluble metal-compound (lake) with metallic salts (mordants) **m rounge** Aluminum acetate

morenosite The mineral $NiSO_4,7H_2O$ Nickel vitriol

Morgan, Sir Gilbert Thomas 1872–1940 A British industrial and research chemist, the first Director of the Chemical Research Laboratory **M , John Livingston Rutgers** 1872– An American physical chemist, noted for research on the liquid state **M equation** A modification of the Ramsay-Shields equation,

$$w(M/D) = k(t_c - t - 6),$$

where w is the weight of the drop of liquid, M mol wt , D density, t_c critical temperature Cf *stalagmometer* Used to determine the molecular weights

morin $C_{15}H_{10}O_7$ = 302 1 *2′ 3 4′ 5 7*-Pentahydroxyflavone A flavone (q v), and the coloring matter of the wood of *Morus tinctoria*, fustic wood, m 285 Used in dyeing wool yellow, and in chemistry, as a sensitive indicator for aluminum, with which it develops a greenish fluorescence

morindone $C_{15}H_{10}O_5$ = 270 1 Trihydroxymethylanthraquinone A red coloring matter, similar to morin, from fustic, the dye wood of *Morus tinctoria*, a Moraceae

Morley, Edward W 1838–1923 An American chemist, noted for his research on the composition and synthesis of water and the density of gases

morograph Death point delineator An instrument that records the death of vegetable tissues

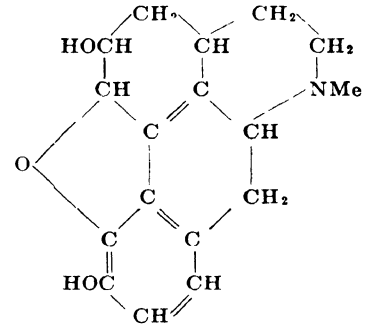
-morph, -morphous A suffix derived from the Greek, meaning "form " See *amorphous, isomorph, monomorph, polymorph*

morphenol $C_{14}H_8O_3$ = 208 05 The anhydride of *3 4 5*-trihydroxyphenanthrene

morphia Morphine

morphina Morphine

morphine $C_{17}H_{19}O_3N$ H_2O = 303 3 Morphina, morphinum, morphia, morphium (*Mo*) An alkaloid derived from opium



Knorr formula

Colorless, shining crystals, d 1 32, decomp 230, slightly soluble in water, alcohol, or ether Used medicinally as a narcotic **apo-** Apomorphine **benzyl-** Peronine **dehydro-** See *dehydromorphine* **diacetyl-** Heroine **dimethyl-** Thebaine **ethyl-** Codethyline **para-** Thebaine **methyl-** Codeine

m acetate (*Mo*)$C_9H_4O_2$ $3H_2O$ = 399 36 A yellowish-white powder, soluble in water, alcohol, or glycerol, used as a narcotic **m anisate** (*Mo*)$C_6H_8O_4$ = 413 35 The salt of morphine and anisic acid, a colorless crystalline salt, soluble in water, used as a narcotic **m benzoate** (*Mo*)$C_7H_6O_2$ = 407 33 The salt of morphine and benzoic acid White prisms or colorless powder, soluble in water, used as a narcotic **m borate** The salt of morphine and boric acid Used in ophthalmology and for hypodermic injections **m bromide** See *m hydrobromide* **m chloride** See *m hydrochloride* **m citrate** (*Mo*)$_3C_6H_8O_7$ H_2O = 1065 92 Colorless crystals soluble in water or alcohol, used as a narcotic **m hydrobromide** (*Mo*)HBr $2H_2O$ = 402 24 Colorless, crystalline needles, soluble in water or alcohol, used for hypodermic injections **m hydrochloride** (*Mo*)HCl $3H_2O$ = 375 8 Colorless needles, soluble in water or alcohol, used medicinally as a narcotic **m hydro-**

sulfate. M. sulfate. **m. lactate.** $(Mo)C_3H_6O_3$ = 375.33. Colorless prisms, soluble in water or alcohol. **m. meconate.** $(Mo)_2C_7H_4O_7.5H_2O$ = 575.5. The natural form of morphine in opium. A yellowish, crystalline powder, soluble in water or alcohol; used medicinally as a narcotic. **m. methylbromide.** Morphosane. **m. phthalate.** $(Mo)_2C_8H_6O_4$ = 736.4. Colorless crystals, soluble in water or alcohol; used for hypodermic injections. **m. saccharinate.** $(Mo).C_7H_4ON(SO_2)$ = 467.2. Colorless crystals. **m. salicylate.** $(Mo)C_7H_6O_3$ = 423.2. A colorless crystalline powder. **m. stearate.** $(Mo)C_{17}H_{35}COOH$ = 569.57. Colorless crystals, soluble in water or alcohol; used as a narcotic. **m. sulfate.** $(Mo)_2H_2SO_4.5H_2O$ = 758.6. Colorless needles, decomp. 250, soluble in water or alcohol. It is the most commonly used morphine salt. **m. tartrate.** $(Mo)_2C_4H_6O_6.H_2O$ = 738.4. A colorless crystalline powder, soluble in water, alcohol, or ether; used medicinally in hypodermic injections. **m. valerate.** $(Mo)C_5H_{10}O_2$ = 387.36. Colorless crystals, soluble in water or alcohol; used medicinally as a narcotic.

morphinone. $C_{17}H_{17}NO_3$ = 283.05. The keto-form of morphine. **dihydro-** Dilaudide.

morphinum. Morphine.

morphol. $C_{14}H_{10}O_2$ = 210.1. *3.4*-Dihydroxyanthracene, *3.4*-phenanthrenediol. White needles, m.143, insoluble in water.

morpholine. C_4H_9ON = 87.1. Tetra-hydro-*p*-oxazine, 2.3.5.6-tetrahydro-1.4-oxazine. The ring compound, $O\langle CH_2.CH_2 \rangle NH$ / $CH_2.CH_2$. A colorless liquid, d.0.9998, b.128, soluble in water, alcohol or ether; used as a reagent for Zn or Cu. **pheno-** See *pheno-morpholine.*

morphology. A branch of biology that deals with the form and structure of the living organism:

internal: cytology = the structure of cells. histology = the structure of cell-aggregates (tissues). anatomy = the structure of tissue-aggregates (organs).
external: taxonomy = the arrangement of organisms.

morphosane. Morphine methylbromide. A proprietary morphine salt, used as a narcotic.

-morphous. See *-morph.*

morrenine. An alkaline isolated from *Morrenia brachystephana*, an Argentine milkweed. Colorless crystals, m.106.

morrhua. The codfish, *Gadus morrhua*, from which cod liver oil is obtained.

morrhuic acid. An acid obtained in the saponification of cod-liver oil. Its salts are used in the treatment of tuberculosis and varicose veins.

morrhuin. $C_{19}H_{27}N_3$ = 297.3. A thick, liquid ptomaine, occurring in some samples of cod liver oils.

morrhuol. The active principle of cod liver oil containing S, I, and P. A dark-brown liquid, d.0.94, insoluble in water; used medicinally in place of cod liver oil.

Morse, Harmon Northrup. 1848–1920. An American chemist noted for osmosis experiments. **M. buret.** A capillary buret holding one cubic centimeter.

mortar. (1) An urn-shaped container of glass, iron, agate, or brass, used for powdering materials. (2) A building material consisting of slaked lime and sand, sometimes mixed with plaster of Paris or cement. Cf. *pozzolana.*

morus. The Latin term for mulberry. **m. tinctoria.** Yellow Brazil wood, old fustic. The yellow wood from *Morus tinctoria;* used for making morin and dyeing textiles.

Morveau. See *Guyton.*

moryl. Carbachol.

mosaic gold. (1) A pigment consisting of stannic sulfide, SnS_2. (2) A yellow alloy of copper and zinc. **m. silver.** An amalgam of tin and bismuth.

Mosander, Carl Gustav. 1797–1858. A Swedish chemist, noted for the discovery of some rare earth metals.

mosandrium. A rare earth metal isolated from samarskite by J. Lawrence Smith; it was later separated into Sa and Gd.

Moseley, Henry Gwyn Jeffreys. 1887–1915. An English physicist killed in the World War; noted for his research on x-ray spectra.

H. G. Moseley.

M. formula. The frequency, ν, is related to Rydberg's constant, ν_0, and atomic number, N, by: $\nu = \frac{3}{4}\nu_0(N-1)^2$. **M. law.** All elements can be arranged successively, according to the frequencies of their x-ray spectra, in one continuous series which corresponds generally with the order of their atomic weights. The following relation exists: $Q = \sqrt{\frac{\nu}{\frac{3}{4}\nu_0}} = N - 1$, or $\sqrt{\frac{1}{2}} = a(N - N_0)$; in which ν is the frequency of the principal line of the x-ray spectrum of longer wavelength, ν_0 is Rydberg's constant, and N the atomic number of the element, which is identical with the nuclear charge or the number of electrons outside the nucleus. **M. number.** Atomic number. **M. series.** An arrangement of elements according to increasing atomic numbers, as determined from the square-root of the frequency of the principal line in their x-ray spectrum. Cf. *periodic chain.* **M. spectrum.** The characteristic lines pro-

duced when the x-rays produced at the anticathode (which consists of the metal under examination) are diffracted through a crystal Cf , *crystallogram x-ray spectrometer K lines*

moslene $C_{10}H_{16}$ = 136 12 A terpene from *Mosla japonica* a Labiatae

moss A small cryptogamic plant of the natural order *Musci* **Ceylon-** See *agar* **Iceland-** Cetraria **Irish-** Chondrus **m agate** Mocha stone A variety of chalcedony or an agate containing brown or black, moss-like dendritic forms due to infiltrations of iron and manganese salts It is used as a semi-precious stone **m gold** Native gold in moss-like form **m silver** Native silver in moss-like form **m starch** Lichenin

motalin A German anti-knock fuel which contains iron penta-carbonyl

mote A solid particle (*e g* , of dust or soot) in air or a gas, which acts as a nucleus of condensation, hence, the black fog of the modern city

mother A progenitor **m cell** A single cell that divides into two daughter cells **m liquor** The residual saturated liquid which remains after the crystallization of a portion of a liquid or solution **m lode** The principal vein of a metallic deposit passing through a district especially the California gold vein extending eighty miles from Amador County to Mariposa County **m of coal** Fusain **m of pearl** Nacre

motherwort The dried herb of *Leonurus cardiaca*, used as the fluid extract, as a bitter tonic and antispasmodic

motile Possessing motion

motility The phenomena of motion, especially as observed under the microscope (colloidal motility, Brownian motion) or detected by chemical or physical means (ionic motions)

motion Change of position **Laws of-** (Newton) (1) A body left to itself will continue in its state of rest or of motion (*2*) The rate of change of momentum of a body is proportional to the impressed force acting on it

motor An agent that produces motion or mechanical power (muscle or machine) **air-** A windmill **electric-** A reversed dynamo or a machine for transforming electrical into mechanical power **hot air-** An apparatus in which a current of hot air drives a set of propellers **water-** A device for transforming a stream of water into mechanical power

motor fuels A liquid (as gasoline) used in internal combustion engines Motor fuels may be manufactured from coal by (1) high temperature carbonization (*2*) low temperature carbonization, (3) Bergius process, (4) gasification and conversion into methanol and other liquid combustibles, (5) cracking processes Cf *petroleum* **synthetic-** Methanol or synthol obtained from hydrogen and carbon monoxide subjected to pressures of 150–250 atmospheres at 300–425°C using a catalyst, *e g* the oxides of Zn, Cr, V, Mn, W, Pb, or Bi

mould, mold (1) A receptacle in which a molten or liquid mass solidifies (2) To shape or form (*3*) A variety of minute fungus growths *Hypomycetes*, found on damp, usually vegetable material, *e g* , *penicillium* (4) The loose earth on the upper surface of cultivated soil Cf *humus*

mountain ash Sorbus **m balm** Eriodictyon **m blue** Azurite **m butter** A hydrated aluminum sulfate, occurring in fibrous masses or crusts **m cork** An elastic form of asbestos **m crystal** Rock crystal **m flax** (1) A fine silky variety of asbestos (*2*) Purging flax The herb of *Linum catharticum*, used as laxative and cathartic **m grape** Oregon grape The root of *Berberis aquifolium*, used as alterative and tonic **m green** Malachite **m laurel** Kalmia **m leather** A tough variety of asbestos, occurring in thin, flexible sheets **m milk** A soft, spongy variety of calcite **m mint** Calamint **m soap** An unctuous variety of halloysite **m tallow** Hatchettenine A wax-like, soft hydrocarbon **m tobacco** See *Arnica* **m wood** A brown, compact, fibrous variety of asbestos

mounting The preparation of specimens for microscopic study

Moureu, Charles Léon Francois 1863–1929 A French chemist noted for research in catalysis, rubber chemistry and autoxidation

mouse jar A glass jar with an iron screen top, to hold small animals **m factor** A supposed vitamin (q v), the absence of which causes blindness in mice

mowrah Mora, mowa The seeds of *Bassia butyraceae*, a Sapotaceae of India **m fat** A soft fatty mass expressed from m , used in soap making **m meal.** The dried and ground residue of m seeds, remaining after expression of the fat It contains saponin and is unfit for animal food, but is used as fertilizer It contains 2 7 % N If spread on lawns or golf greens and washed into the ground it causes worms to come to the surface

m-radiations See *M*

ms Abbreviation for *meso-*

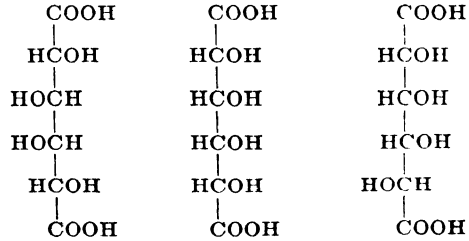
M S or **M Sc** Abbreviation for Master of Science

mu The greek letter μ A unit of microscopical length, micron or micromillimeter

muava The dried bark from a leguminous tree of Madagascar, used by the natives as an arrow poison

muavine An alkaloid from muawa or muavi bark, an East African tree of the *Erythrophloeum* species of the Leguminosae A yellowish powder, soluble in water or alcohol, used as a digitalin substitute

mucic acid $C_6H_{10}O_8$ = 210 5 *2 3 4 5*-Tetrahydroxy hexanedioic acid A tetrahydroxy acid, $COOH(CHOH)_4COOH$ Colorless crystals, decomp 224, insoluble in water or alcohol, formed by the oxidation of *d*- galactose Three of the other ten isomers of this constitution are named from mucic acid, namely *allo* m from *l*-galactose and *d*- and *l-talo* m from *d*- and *l-talose*, respectively



mucicarmine A staining solution for mucin, consisting of 2 pts carmine, 1 pt aluminum chloride and 1 pts distilled water

mucilage (1) A paste prepared from dextrin or gum (2) In pharmacy, a solution of acacia chondrus (Irish moss), tragacanth, or starch

mucilaginous Slimy or adhesive

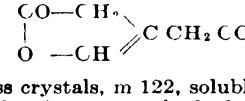
mucin A glycoprotein, or the chief constituent of mucus, the slimy secretion of organs or organisms It is soluble in water and precipitated by alcohol Cf *chitosan, mucoid* **frog egg-** M from frog eggs, it yields galactosamine on hydrolysis **salivary-** M from saliva containing mucoitinsulfuric acid **m sugar** Fructose

muck (1) A soil composed largely of organic matter so highly decomposed as to show little or nothing of the original plant structure Cf *humus* (2) Peat (3) The miners' term for loose rock and ore

muckite A resinous substance, $C_{20}H_{28}O_6$, found in some coal beds

mucoid A group of glycoproteins, differing from the mucins in solubility and precipitated by acetic acid They are found in bone tendon cartilage the cornea white of egg and ascitic fluids **ovo-** The nitrogeneous substances from the white of egg which do not coagulate **chondro-** M from cartilage yielding chondroitin sulfuric acid **cornea-** A m from the cornea **ovo-** A m forming 10 % of the solids of egg-white **serum-** A mucoid from blood serum forming from 0 5–1 % of its proteins

mucolactonic acid $C_6H_6O_4$ = 142 0



Colorless crystals, m 122, soluble in water

mucolipoid A compound which contains a fatty acid residue bound to a carbohydrate residue, *e g* , Wassermann antigens

muconic acid $C_6H_6O_4$ = 142 0 *2 4*-Hexadienedioic acid, $\Delta^{1\,3}$-1,4-butadiene carboxylic acid, COOH CH CH CH CH COOH Colorless crystals, m 260, decomp 272, soluble in water

mucopolysaccharide A compound having a low but significant protein content, but whose chemical reactions are primarily those of a carbohydrate *E g* , skin, heparin

mucoprotein A compound having a relatively high protein or peptide content, but whose chemical reactions are predominantly those of a protein, *e g* , plant globulins

mucorin A protein from plant molds

mucous Mucus

mucus (1) Slimy (2) The saliva (3) A slimy secretion from an organ or organism **vegetable-** Tragacanthin

mudaric acid $C_{30}H_{46}O_3$ = 454 37 An acid from *Calotropis gigantea* (mudar) an Asclepiadaceae

mudat The poorest quality of opium, which consists of the refuse recovered from "yenshee," q v

Muencke pump A filter pump made of glass, attached to a water faucet

muffle A semicylindrical container of alundum, fire-clay, porcelain or silica, that protects substances placed in it from fuel gases and sudden temperature changes when heated **m furnace** A square box of fire-clay, provided with resistance wires or other means of heating, which produces high temperatures rapidly owing to reflection of the heat from the walls Used in laboratory operations (drying, fusion, cupellation, scorification, ignition), for hardening high carbon steel (razor blades, dies, punches), and for experimental work, and in dental laboratories, for porcelain and gold work

mugwort Felon herb The leaves of *Artemisia vulgaris* a Compositae used as emmenagogue and diaphoretic

muirapuama The dried stems and roots of *Dulacia ovata* of Brazil, used as a fluid extract, as an aphrodisiac or nervine

muirapuamine An alkaloid obtained from muirapuama wood, an *Olacaceae* of Brazil

mukogen $C_{18}H_{15}N_2O_6Cl$ = 326 5 Dimethylphenyl-*p*-ammonium-*β*-oxynaphtoxazime chloride A green crystalline powder insoluble in water soluble in alkalis or alcohol used as a cathartic

mullein flowers The dried flowers of *Verbascum thapsus*, a Scrophulariaceae used as the fluid extract, as a demulcent **m leaves** The dried leaves of *Verbascum* species used as the flowers

Muller's glass Hyalite

Mulliken, Samuel Parsons 1864– An American chemist, noted for methods of identifying organic compounds **M 's classification** An arrangement of organic compounds based upon their qualitative (*genus*) and quantitative (*order*) reactions

Order I —Compounds containing
(1) carbon and hydrogen
(2) carbon, hydrogen and oxygen
Order II—Compounds containing
(1) carbon and nitrogen
(2) carbon, nitrogen and hydrogen
(3) carbon, nitrogen and oxygen
(4) carbon, nitrogen, hydrogen and oxygen
Higher Orders—Compounds containing any combination of the elements found in order I and II with any additional elements such as halogens, sulfur, phosphorus etc
Suborder I—*Colorless* compounds
Suborder II—*Colored* compounds
Genus I consists of aldehydes
Genus II consists of carbohydrates
Genus III consists of acids
Genus IV consists of phenolic compounds
Genus V consists of esters
Genus VI consists of anhydrides
Genus VII consists of ketones
Genus VIII consists of alcohols
Division A of each genus are *solid* compounds
Division B of each genus are *liquid* compounds
(See M , Method of Identification of Pure Organic Compounds)

mullite $3Al_2O_3\ 2SiO_2$ An orthorhombic aluminum silicate, from the Island of Mull, or artificially made by heating andalusite, sillimanite or cyanite, and consists of a homogeneous solid solution of alumina in sillimanite It is the only compound of Al and Si which is stable at high temperatures, and it is formed in fire-clay above 1060°C , it does not deform under loads up to a temperature of 1800°C is resistant to corrosion and has a low coefficient of expansion Used as a refractory

mulls A group of pharmaceutical ointments of high melting point, which are spread on soft muslin or "mull"

mulser An emulsifying machine

multi- A prefix derived from the Latin, indicating "many" Cf *poly-*

multifrequent Different wavelengths, as comprising a heterogeneous beam of light

multiple proportions Dalton's law The chemical elements always combine in a definite ratio or in multiples of that ratio If A and B form several compounds, then the ratio of their relative combining masses is a simple one as N_2O NO N_2O_3 NO_2, and N_2O_5 **m series** Parallel series A method of wiring a large number of lamps, electrical apparatus, or other devices in series, and connecting these series in parallel It is used in mining for wiring a large number of blasting charges **m tube burner** Three or more bunsen burners mounted close together and supplied from one connection

multiplet A spectral line, which on close examination is found to consist of two, three or more single lines close together Hence the terms, doublet and triplet

multipolar Having more than two poles

multirotation Birotation

multivalent Having a valency of three or more Cf *polyvalent* **m vaccine** A suspension of two or more species or varieties of the same microorganism

mumetal An alloy which contains approximately 74 % Ni, 20 % Fe, 5 3 % Cu and 0 7 % Mn It has a high magnetic permeability and low hysteresis, used for electric cables

mundic Iron pyrites **white-** Arsenical iron pyrites

mung Green gram The mung bean, *Phaseolus mungo* (*Ph aureus*), used in China and India as a food, it is rich in vitamin B

Munktell paper A brand of filterpaper

Muntz metal Yellow brass An alloy of 60 parts copper and 40 parts zinc It can be rolled hot or cold and is corroded less than copper

murexan Uramil

murexide $C_8H_4O_6N_5NH_4H_2O$ = 302 2 Ammonium purpurate Purple carmine A purple coloring matter produced from uric acid by the action of nitric acid and neutralizing with ammonia Brownish-red, crystalline powder, green in reflected and red in transmitted light, soluble in water, insoluble in alcohol or ether, used as a dye

muriacite Anhydrite

muriate An obsolete term for chloride **m of potash** Potassium chloride **m of soda** Sodium chloride

muriatic acid An obsolete term for hydrochloric acid **oxygenated-** An early name for chlorine

muscarine $C_5H_{19}O_3N$ = 177 11 Hydroxycholine, $MeCH_2CHOH\ CH(NMe_3OH)CHO$ An alkaloid from mushrooms, *Agaricus muscarius* and a ptomaine of decaying fish It is extremely poisonous and resembles pilocarpine in its effects Cf *amanitine* **m effect** See *m wirkungs einheit* **m hydrochloride** $Me_3NCl\ CH_2\ CH(OH)_2\ HCl$ = 277 5 Colorless crystals, soluble in water **m nitrate** $Me_3C(OH)\ CH_2\ CH(OH)_2\ HNO_3$ = 198 14 An oxidation product of choline Brown, hygroscopic crystals, soluble in water or alcohol **m sulfate** $C_5H_{15}O_3N\ H_2SO_4$ = 238 1 *artificial-* An oxidation product of choline Yellowish, deliquescent needles soluble in water *natural-* A salt from the alkaloid of *Amanita* (toadstool) Dark-brown syrup, soluble in water, used medicinally as a cardiac sedative **m wirkungs einheit** M W E A unit of poison effect, the amount which, in Ringer solution, reduces the activity of an isolated frog heart by 25 ± 5 % Muscarine base has 184 Mill M W E per gram

muscarufin (1) $C_{25}H_{16}O_9$ = 460 15 An orange dyestuff, m 275 5 from *Amanita muscaris* (2) $C_{25}H_{16}O_5$ = 396 15 A glucoside from *Amanita muscaris*

musci Mosses A division of Bryophyta

muscicide An agent that destroys flies

muscle fibrin Syntonin **m sugar** Inositol

muscone $C_{16}H_{30}O$ = 238 2 Muskine *3-*methyl cyclopentadecanone A ketone derived from musk A thick, heavy liquid, b 328, used in perfumery

muscovite $KH_2Al_2(SiO_4)_3$ Phengite A potash-mica, and constituent of granite Varieties are baddeckite, damourite, fuchsite sericite and plumose mica

musenine Mussanine

musennin An acid resin from the bark of mussena (*Albizzia anthelmintica*), a Leguminosae, used as a tenifuge

mushroom (1) A fungus (q v) having the form of a toadstool, *e g* , *Amanita, Boletus* (2) The edible m , *Agaricus campestris*

musical note A succession of sharp regular impulses at regular intervals of time (Cf *sound, phonic*) **m scale** An arrangement of sound vibrations in a harmonic series the frequency of vibration of successive notes being denoted by fixed ratios for a particular scale The scientific diatonic scale is based upon C_3 = 256 vibrations per sec , the musical even-tempered chromatic scale, on A_3 = 435 v p s The lower and higher octaves are obtained by multiplying or dividing by a power of two

Scientific scale		*Practical scale*			
C_3	256	C_3	258 6	C_3	274
D_3	288	D_3	290 3	D_3	307 6
E_3	320	E_3	325 9		
F_3	341 3	F_3	345 3	F_3	365 8
G_3	384	G_3	387 5	G_3	410 6
A_3	426 6	A_3	435	A_3	460 8
B_3	480	B_3	488 3		
C_3	512	C_3	517 3		

musk Moschus, deer musk, tonquin musk The dried secretion from the follicles of *Moschus moschiferous*, the musk deer of Central Asia Irregular, dark, shiny grains of penetrating and persistent odor, soluble in water or alcohol, used in perfumery, and medicinally as an antispasmodic **artificial-** $C_{12}H_{13}N_3O_6$ = 295 1 *2 4 6-*Trinitro-*1 3-*dimethyl-*5-tert* -butylbenzene Trinitro-*tert* -butyl xylene, $Me_2C_6(NO_2)_3CMe_3$ A musk substitute, occurring in colorless prisms, m 96, slightly soluble in water used in perfumery **vegetable-** M seed **m root** Sumbul **m seed** The seeds of *Hibiscus abelmoschus*, a Malvaceae used for clarifying sugar, and medicinally

muskine Muscone

Muspratt, James Sheridan 1821–1871 An Irish chemist, and founder (1848) of the College of Chemistry in Liverpool, noted for his works on applied chemistry

mussanine Musenine An alkaloid from *Acacia anthelmintica*

must (1) Most The expressed and unfermented juice of grapes (2) Any juice freshly expressed from fruits

mustard A condiment made by grinding the seeds of *Brassica* (*Sinapis*) species **black-** The finely-ground seeds of *Brassica nigra* It con-

tains a fixed oil, a pungent, irritant, essential oil consisting chiefly of allyl thiocyanate, an enzyme myrosin, and a glucoside sinigrin Cf *sinamine* **French-** Table m **table-** A semi-liquid mixture of 3 parts white mustard, ½ part salt, 1 part sugar, and 8 parts vinegar **white-** Yellow or English mustard The finely-ground seeds of *Sinapis alba*, containing the same constituents as black mustard except that a different glucoside (sinalbin) is present Used as a condiment and medicinally, as a counter-irritant and stimulant **m meal** The dried and ground residue of m seeds after extraction of the oil It contains 5 % N, 1 % P_2O_5 and 1 % K_2O, used as fertilizer **m seeds** The dried ripe seeds of *Brassica nigra*, used as a source of m oil

mustard gas $C_4H_8Cl_2S$ = 158 9 *2,2'*-Dichlorodiethyl sulfide, yperite, H S , $(CH_2Cl\ CH_2)_2S$ A sulfoether occurring as an oily liquid d 1 28, m 14, b 215–217, which was used in the World War as a vesicant, it causes blistering of the skin by penetrating the tissues and forming HCl

mustard oil (1) A fixed oil expressed from mustard seeds, d 1 1014, m −17, it is used in medicine (2) Oleum sinapis volatile A volatile or essential oil obtained by distillation of macerated mustard seeds Its chief constituents are allyl isothiocyanate and allyl thiocarbimide A colorless liquid of pungent odor d 1 018, b 148 soluble in alcohol, ether, or chloroform, used in medicine (3) Allyl isothiocyanate, C_3H_5CNS = 99 0 Allylmustard oil $CH_2\ CH\ CH_2\ N\ CS$, a colorless liquid, d 1 017, b 151, which was used in the World War as poison gas (4) Acrinyl isothiocyanate (5) A group of isothiocyanic esters See *mustard oil* **artificial-** Mustard oil (3) **black-** Mustard oil (2) **fixed-** Mustard oil (1) **essential-** Mustard oil (2) **synthetic-** Mustard oil (3) **volatile-** Mustard oil (2)

mustard oils Isothiocyanates, isosulfocyanic esters, sulfocarbimides Compounds containing the monovalent —N C S radical

MeNCS Methyl mustard oil m isothiocyanate m isosulfocyanic ester m sulfocarbimide Colorless crystals m 34, b 119

EtNCS Ethyl mustard oil A colorless liquid b 133

PrNCS Propyl mustard oil A colorless liquid b 153

Me_2CHNCS Isopropyl mustard oil A colorless liquid, b 137

$CH_2:CHCH_2NCS$ Allyl mustard oil See *mustard oil* (3)

mutamer A compound showing dynamic isomerism, that is the attainment of equilibrium which is the cause of mutarotation, *e g*, α- and β-*d*-glucose

mutamerism The phenomenon of changing from one newly-dissolved isomer into another and establishing an equilibrium between the two, as shown by mutarotation, q v

mutarotation Birotation A change of optical rotation occurring in newly-prepared solutions of reducing sugars Thus α-*d*-glucose solution has at first a specific rotation of $[\alpha]_D$ + 110°, this drops slowly to +87° in 25 minutes, and finally to +52 5° in six hours, at which it remains constant (β-*d*-glucose)

Muthman liquid Acetylene tetrabromide

mutterlauge German for *mother liquor*

mutual induction The change of current in a circuit produced by a change of current in a neighboring circuit

M W Abbreviation for molecular weight

M W E Muscarine wirkungs einheit

mycelioid A bacterial growth that resembles the radiated filamentous appearance of molds

mycelium A mass of protoplasmic colorless threads, constituting the plant body of mushrooms toadstools and certain molds (spawn)

Mycoderma Torula

mycogalactan $(C_6H_{10}O_5)_n$ A polysaccharide from the fungus *Aspergillus niger*

mycophenolic acid $C_{17}H_{20}O_6$ = 320 2 An acid from the mould fungus, *Penicillium brevi-compactum*

mycoporphyrin Penicilliopsin

mycoprotein The albuminous material of bacteria

mycose $C_{12}H_{22}O_{11}\ 2H_2O$ = 360 17 A carbohydrate occurring in manna, several fungi, and in ergot of rye It does not reduce copper solutions and is soluble in alcohol Cf *trehalose*

mycosterol $C_{30}H_{48}O_2$ = 440 37 A sterol, m 160, from fungi and lichens

mycoxanthin A biologically-active carotinoid, from algae

mydaleine A ptomaine from putrefied viscera

mydatoxin $C_6H_{13}O\ N$ = 131 1 A ptomaine from decaying flesh

mydine $C_9H_{11}O_2N$ = 165 1 A ptomaine found in cultures of typhoid bacillus and in putrefied flesh

mydriatic An agent that causes dilation of the pupil, as atropine, homatropine daturine cocaine

mydrol Midrol

myelin (1) A soft, yellowish kaolin (2) A lipoid from organic tissues differing from fat in being doubly refractive

mykonucleic acid $C_{36}H_{51}O_{34}N_{14}\ 2P\ O_5$ = 1192 5 A nucleic acid obtained from yeast

mykose Mycose

mylonite A rock deformed by earth movements so as to lose all its original structure

myocardiograph An apparatus for recording movements of the heart muscles

myogen An albumin in muscle juice that is said to change to myosin, soluble in water and salt solutions

myoglobin The principal red pigment of meat it is similar to hemoglobin

myosin A globulin forming the clot in muscle press juice, insoluble in water, soluble in dilute alkali or salt solutions, coagulated by heat, and converted into santonin by acids Cf *myogen*

myotic Miotic An agent that causes contraction of the pupil as eserine, pilocarpine

myoxanthin A lipochrome, m 117 5 from the unsaponifiable matter of *Rivularia nitida*

myrabolan Myrobalan

myrbane oil Nitrobenzene

myrcene $C_{10}H_{16}$ = 136 1 *2*-Methyl-*6*-methylene-*2 7*-octadiene* The unsaturated hydrocarbon,

$$Me_2C{:}CH\,CH_2\,CH_2\,C\!\left<\begin{matrix}CH_2\\ CH\ CH_2\end{matrix}\right.,$$

an isomer of ocimene and a constituent of bay oil and other essential oils A colorless liquid, d 1 467, b 67

Myrcia A genus of tropical trees, Myrtaceae, related to the tree-myrtles **m oil** The essen-

tial oil of *Pimenta acris*, a Myrtaceae of the West Indies

myria- A prefix derived from the Greek, indicating 10,000

myrialiter Ten thousand liters

myriameter Ten thousand meters, or ten kilometers

myrica Bayberry, waxmyrtle, candleberry The dried bark of *Myrica cerifera* a shrub of the United States, used in medicine **m leaves** The leaves of *Myrica acris*, from which bay-rum is prepared **m oil** Bay oil

myricetin $C_{15}H_{10}O_8$ = 318 1 Oxyquercetin A ketone and yellow pigment derived from the bark of Myrica species

myricetrin A glucoside resembling quercitrin

myricin $C_{30}H_{61}O_2C_{16}H_{31}$ = 676 9 Myricyl palmitate A fatty ester (wax) and crystalline principle from bees-wax, or extracted from the bark of the wax myrtle (*Myrica cerifera*)

myricoid The combined principles of *Myrica cerifera* (wax myrtle), used medicinally as an alterative and hepatic stimulant

myricyl The monovalent radical, $C_{30}H_{61}$— **m alcohol** $C_{30}H_{61}OH$ = 438 7 Melissic alcohol A constituent of carnauba and bees-wax Colorless needles, m 85, insoluble in water, soluble in alcohol or ether **m palmitate** Myricin

myriocarpin A neutral resinous substance, insoluble in water, soluble in alcohol, from the fruit of *Cucumis myriocarpus*, wild cucumber, a Cucurbitaceae

myristamide $C_{14}H_{29}NO$ = 227 23 Tetradecanamide*, myristic amide, $Me(CO_2)_{12}CONH_2$ White leaflets, m 103, b $_{12mm}$217

myristic acid $C_{13}H_{27}COOH$ = 228 29 Tetradecylic acid, tetradecanoic acid* An acid occurring in many fats, human subcutaneous fat contains 1 % Colorless leaflets, m 54, b 251, insoluble in water, slightly soluble in alcohol or ether

myristica Nutmeg, nux moschata The kernels of the ripe fruits of *Myristica fragrans* used as a condiment, and in pharmaceutical preparations Cf *mace, otoba* **m oil** Oleum myristicae, oil of nutmeg The essential oil of m

myristicene $C_{10}H_{14}$ = 134 1 An eleoptene derived from the essential oil of nutmeg

myristicin $C_{11}H_{12}O_3$ = 192 1 *3*-Methoxy-*4-5*-methenedioxypropenyl benzene, *5*-methoxysafrole An aromatic ether from myristica oil, a yellow liquid, d 1 1425, m below −20, b $_{15mm}$149 5

myristicol $C_{10}H_{16}O$ = 152 1 A stearoptene from the essential oil of nutmeg

myristin $(C_{14}H_{27}O_2)_3C_3H_5$ = 722 9 Trimyristin, glyceryl myristate, trimyristic acid glycerin ester, laurel wax, myrtle wax A fat in nutmeg butter, spermaceti, and other fats Colorless needles, m 55, soluble in ether, insoluble in water

myristoleic acid $C_{14}H_{26}O_2$ = 226 2 Tetradecenoic acid* Unsaturated fatty acid from whale and fish oils Δ^9- Colorless liquid, b $_{2mm}$135 The Δ^5-isomer also exists

myristone $(C_{13}H_{27})_2$ CO = 394 57 Myristic ketone A solid, d 0 801, d $_{76°}$76, m 75, soluble in alcohol

myrobalan Terminalia The dried fruits of *Terminalia* (*Myrobalanus*) *chebula*, a Combrataceae, a tree of Asia, containing 30 % tannin, used as tanning material Cf *beda nuts, chebulinic acid*

myronic acid $C_{10}H_{19}NS_2O_{10}$ = 377 3 An acid found in sinigrin, the glucoside of black mustard, which is hydrolysed to mustard oil

myrosase Myrosin

myrosin Myrosase An enzyme of white and black mustard, which hydrolyzes the glucosides sinalbin and sinigrin to allyl mustard oil, glucose, and potassium sulfate

myroxin $C_{23}H_{36}O$ = 328 31 A principle from Peru balsam

myrrh A resinous gum exuded from the stems of *Commiphora myrrha*, a burseraceous tree of Arabia, Abyssinia, and Somaliland It contains the resin myrrhin, a volatile oil, and a gum, which occurs as irregular brown tears or masses of balsamic odor Used medicinally as an astringent or carminative, and in dentistry for carious teeth, and in toothpowders **m oil** An essential oil distilled from myrrh A colorless liquid d 0 998, b 220–235, insoluble in water, soluble in alcohol or ether, used in perfumery Cf *oxyburserasin, myrrholic acid*

myrrhin A resin from myrrh

myrrholic acid $C_{17}H_{27}O_5$ = 306 17 An acid from myrrh

Myrtaceae The bay or eucalyptus family, a group of trees and shrubs which usually have pungent and fragrant leaves, fruits and seeds, that yield essential oils and spices

roots	
Eucalyptus globulus	eucalyptus
	eucalyptus oil
Eugenia vulgaris	jambosine
leaves	
Pimenta (Myrcia) acris	bay leaves
	bay oil
Eugenia chekan	chekan
Melaleuca leucadendron	cajuput oil
Myrtus communis	myrtle, myrtol
flowers	
Eugenia aromatica	cloves
	clove oil
fruits and seeds	
Pimenta officinalis	pimenta
	pimenta oil
Eugenia jambolana	Java plum

myrtenal $C_{10}H_{14}O$ = 150 11 Myrtenic aldehyde A colorless liquid, d 0 988, b $_{10mm}$90, obtained from myrtol

myrtenic acid $C_{10}H_{14}O$ = 166 2 An acid from myrtol

myrtenol $C_{10}H_{16}O$ = 152 12 An alcohol, d 0 976, b 224, and the chief constituent of myrtol

myrtilin An aqueous extract of myrtle, used as an insulin substitute

myrtillidin The aglucone of an anthocyan glucoside from the flowers of stocks, rose and mallow

myrtillin $C_{22}H_{22}O_{12}$ = 478 17 An anthocyanin from billberry, *Vaccinium myrtillus*, an Ericaceae, used as an indicator **m chloride** (1) $C_{22}H_{23}ClO_{12}$ = 514 67 An anthocyanin from whortle berries, *Vaccinium uliginosum* (2) A plant extract from *Vaccinium* with insulin-like properties

myrtle The dried leaves of *Myrtus communis* The finely-powdered leaves are used as antiseptic in wound-dressings **m oil** A light yellow oil distilled from myrtle leaves, which contains eucalyptole, d-pinene, and dipentene d 0 90, insoluble in water, soluble in alcohol or

ether used in medicine for vapor inhalations
m oil Myrtol **m wax** Bayberry wax

myrtol A refined myrtle oil, the essential oil of *Myrtus communis*, used in medicine for bronchial and pulmonary affections, and as an antiseptic Cf *myrtenal*, *myrtenol*

mystin A mixture of sodium nitrite and formaldehyde used as a preservative

mytilite Mytilitol

mytilitol $C_7H_{14}O_6$ = 194 11 Mytilite, pentahydroxy methoxybenzene, methyl inositol, $C_6(OH)_5OMe$ A methyl cyclose from the mussel *Mytilus edulis* Rhombohedral crystals, d 1 335, m 186, b 210 Cf *inositol*

mytilotoxin $C_6H_{15}O_2N$ = 133 2 A leukomaine derived from mussels and rendered harmless by canning alkaline

mytolin A protein obtained from muscles, to which the empirical formula $C_{234}H_{360}O_{70}N_{60}S$ has been given

myxo- A prefix indicating mucus or mucoid
m xanthinophyll $C_{40}H_{56}O_7$ = 648 6 The characteristic pigment of certain freshwater algae

myxomycetes Mycetozoa, myxogastres, slime molds A group of thallophytes, comprising microorganisms having both vegetable and animal characteristics

N

N (1) The symbol for nitrogen **N_2**-nitrogen molecule, **N_2*** an excited N molecule, **N*** an excited N atom, **NI** an ionized atom, **NII** a doubly-ionized N atom (2) The abbreviation for (a) normal, (b) normal solution (3) Avogadro's number, the number of molecules in one mol **N electron** The e of the N shell or orbit, there are eight in the third, eighteen in the fourth, and thirty-two in the fifth period **N orbit** The fourth layer or energy level in which electrons move around the proton in the dynamic atom **N shell** The fourth layer or energy level in which electrons oscillate in the static atom **N V M** Abbr for non-volatile matter **N W acid** Neville acid

N- In chemical names the radical prefixed by N- is attached to the nitrogen atom

n (1) Any unknown number, as in C_nH_{2n} (2) The symbol for the index of refraction (3) The number of molecules (q v) in 1 cc of gas (4) Transport number **n rays** See *n-rays*

n- In chemical names normal, as distinguished from isomeric, thus, *n*-butane or *n*-butanol

ν The Greek letter nu A symbol for frequency

η The Greek letter eta See under *E*

Na The symbol for sodium (natrium)

naal oil An essential oil distilled from naal grass, *Cymbopogon nervatus*, a grass growing in the Sudan Colorless or slightly yellow liquid d 0 954 insoluble in water, soluble in alcohol or ether Its chief constituents are l-limonene and perilla alcohol

nacre Mother of pearl The hard, iridescent inside layer of oyster, mussel, abalone and other sea-shells

nadorite $PbClSbO_3$ A native Algerian lead chloro-antimonate occurring in brownish orthorhombic crystals

naehrsalz (Germ for nutrient salt) A mixture of sodium and ammonium phosphates

naftolens $(C_3H_4)_n$ A group of unsaturated vulcanisable hydrocarbons, b 200–380 obtained from acid tar by-products of mineral oil refining, used as extenders for rubber

nagyagite Tellurium glance A lead sulfotelluride which contains gold and antimony

nahcolite Naturally-occurring sodium bicarbonate

nakrite $Al_2O_3,2SiO_2.H_2O$ A gray-white clay

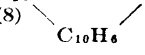
nandinine $C_{19}H_{19}O_3N$ = 309 2 A diisoquinoline alkaloid from the root-bark of nanten, *Nandina domestica* a berberidaceous tree of Japan Cf *domesticine*

nantokite CuCl A native cuprous chloride

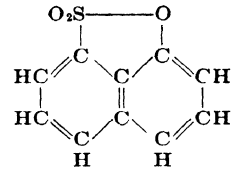
napalite C_6H_4 A native hydrocarbon, a dark red wax m 42, b 300, from the Phoenix mine, near Napa Cal

napelline $C_{26}H_{35}O_4N(OH)_4$ = 541 3 Benzaconine An alkaloid from aconite

Napels Incorrect spelling of Naples, *q v*

naphsultam acid $C_{10}H_7O_2NS$ = 205 1 The ring compound, (8)  (1) Cf *naphsultone*

naphsultone $C_{10}H_6O_3S$ = 206 1 Naphthosultone The ring compound,



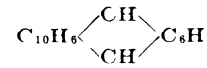
Colorless crystals, m 154, b 360, soluble in water, alcohol or ether

naphtalin Naphthalene

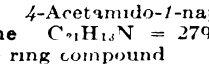
naptha (1) Oils of the C_nH_{2n+2} series A mixture of low-boiling hydrocarbons, b 95–150, obtained in the distillation of petroleum coal tar, and shale oil (2) Gasoline (3) A kind of bitumen, q v **boghead-** Photogen **coal tar-** Mainly benzene and its homologs **petroleum-** Mainly paraffins and naphthenes distilled from crude oil **shale-** Ligroin It contains olefines and paraffins **solvent-** A coal tar distillate **wood-** Mainly methyl alcohol and acetone, obtained by the distillation of wood, used as a solvent and for denaturing alcohol

naphtha aceti Ethyl acetate

naphthacene $C_{18}H_{12}$ = 228 1 A hydrocarbon and ring compound

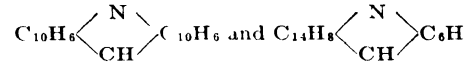


naphthacenequinone 5 12- $C_{18}H_{10}O_2$ = 258 1 The aromatic ketone and ring compound



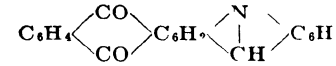
naphthacetol 4-Acetamido-1-naphthol

naphthacridine $C_{21}H_{13}N$ = 279 1 Dibenzacridine The ring compound



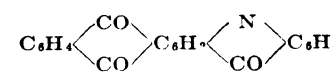
There are 6 possible isomers **di-** Dinaphthacridine **fluoren-** Fluorenaphthacridine **pheno-** Benzacridine

n dione $C_{21}H_{11}O_2N$ = 319 11 Anthraquinone acridine A group of compounds of the type



n 8 13- dione

n trione $C_{21}H_{10}O_3N$ = 324 12 Anthraquinone acridone A compound of the type



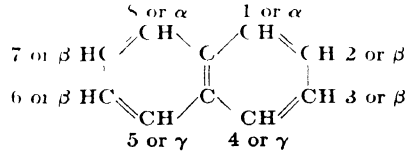
n 5 8 13- trione

naphthal. The bivalent radical, $C_{10}H_7CH—$, from naphthoic aldehyde

naphthalene* Dekalin

naphthaldehyde $C_{10}H_7CHO$ = 156 1 Naphthoic aldehyde, naphthalene carbonal **alpha-** A colorless liquid, b 291 **beta-** Colorless crystals m 59

naphthalene* $C_{10}H_8$ = 128 1 Naphthalin naphthene tar camphor A hydrocarbon obtained from coal tar distillates

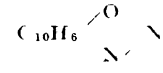


Colorless monoclinic crystals, d 4°1 152, m 80, b 218, insoluble in water, soluble in alcohol or ether Used as raw material for aniline dyes, under the name of "albocarbon," for enriching illuminating gas and gasolene, for the manufacture of indigo and lampblack and as an insecticide (moth balls), mordier and antiseptic The mono-substitution products are alpha-, beta- or gamma-, compounds The poly-substitution products are termed according to numbers or names viz

1 2	= ortho	= *o* —
1 3	= meta	= *m* —
1 4	= para	= *p* —
1 5	= ana	= *α* —
1 6	= epi	= *ε* —
1 7	= kata	= *κ* —
1 8	= peri	= *π* —
2 6	= amphi	= *φ* —
2 3	= pros	= *ρ* —

acetyl- Naphthylmethyl ketone **amino-** Naphthylamine **azo-** See *azonaphthalene* **azoxy-** See *azoxynaphthalene* **benzyl-** See *benzylnaphthalene* **bi-** See *binaphthalene* **bromo-*** $C_{10}H_7Br$ = 206 97 **1-** or *α-* Colorless crystals, m 5, b 279 d 1 476 **2-** or *β-* Colorless crystals, d 1 605, m 59, b 282 **chloro-*** $C_{10}H_7Cl$ = 162 51 **1-** or *α-* Colorless liquid, d 1 191, b 258, immiscible with water **2-** or *β-* Colorless crystals, d 1 138, m 56, b 264 3 Used in organic synthesis and added to gasoline to lubricate the valve stems of internal combustion engines (*halowax*) **chlorinated- C K** wax **decahydro-*** Dekalin **di-** Binaphthalene **diamine-** Naphthylenediamine **dihydro-*** $C_{10}H_{10}$ = 130 08 **1 2-** or o- Colorless liquid, d 0 997, m −9, b $_{16mm}$84 5 **1 4-** or p- d 0 998 m 15 5, b 212 **diazoamine-** See *diazoaminonaphthalene* **dichloro-*** $C_{10}H_6Cl_2$ = 196 96 Colorless solids, insoluble in water **1 2-** d 1 315, m 37 b 282 **1 3-** m 61, b 289 **1 4-** d 1 300, m 68, b 287 6 **1 5-** m 107 **1 6-** m 48 **1 7-** d 1 261, m 62, b 286 **1 8-** d 1 292, m 88 **2 3-** m 120 **2 6-** m 135, b 285 **2 7-** m 114 **dihydro-*** $C_{10}H_{10}$ = 130 08 Dialine A colorless liquid consisting of **1 2-** or o- d 0 997, m −9, b $_{16mm}$84 5, and **1 4-** or p- d 0 998, m 15 5, b 212 **dihydrodiketo-** Naphthoquinone **dihydroketo-** Naphthalenone **dihydroxy-** Naphthalenediol **dimethyl-*** $C_{12}H_{12}$ = 156 09 **1 4-** Colorless solid, d 1 1016, b 264 3 **2 3-** b 266 **2 6-** m 111 **dinitro-** Dinitronaphthalene **ethoxy-*** Bromelia **ethyl-*** $C_{12}H_{12}$ = 156 09 **1-** or *α-* Colorless liquid, d 1 064, m −1 1 b 258 **2-** or *β-* m −19, b 251 d 1 008 **ethylene-** Acenaphthene **fluoro-*** $C_{10}H_7F$ = 146 05 **1-** or *α-* d 1 135, b 216 5 **2-** or *β-* m 59, b 212 5 **hexahydro-*** $C_{10}H_{14}$ = 134 11 A colorless liquid, d 0 934 b 205 5 **hydrazo-** Hydrazonaphthalene **hydroxy-** Naphthol **isopropylmethyl-** Eudalene **methyl-*** $C_{11}H_{10}$ = 142 08 **1-** or *α-* Colorless liquid d 1 025, m −22, b 243 **2-** or *β-* Colorless crystals d 1 029, m 35 1 b 245 **methyl-n-propyl-** Eudalene **monoxy-** Naphthol **nitro-*** Nitronaphthalene **para-** Anthracene **phenyl-** Phenyl-naphthalene **phenyldihydro-** Atronene **tetrahydro-*** Tetralin **tetrahydrotetramethyl-** Irene **tetrahydrotrimethyl-** Ionene **tetranitro-*** See *tetranitronaphthalene* **trimethyl-** Saphotalene **trinitro-*** See *trinitro-naphthalene*

n aldehyde Naphthoic aldehyde **n carbonal** Naphthaldehyde **n carboxylic acid** Naphthoic acid **n diamine** Naphthylene diamine **n -2 1-diazo oxide** $C_{10}H_6N_2O$ = 170 1

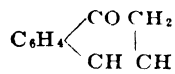


Colorless crystals, m 76 **n dicarboxylic acid** $C_{10}H_6(COOH)_2$ = 216 12 (1) **1 5-**Colorless crystals, m exceeds 286 (2) **1 8** Naphthalic acid **n diol** See *naphthalenediol** **m disulfonic acid** $C_{10}H_6(SO_3H)_2$ = 288 2 Armstrong acid **2 6-** or amphi- Colorless needles soluble in water or alcohol insoluble in ether, used in organic synthesis **2 7-** or pros- Colorless leaflets, very soluble in water or alcohol, insoluble in ether, used in organic synthesis **n red** Magdala red A complex red dyestuff derivative of naphthalene **n sulfinic acid** $C_{10}H_7SO_2H$ = 192 13 A colorless solid, *alpha-* m 85 *beta-* m 105 **n sulfonic acid** $C_{10}H_7SO_3H·H_2O$ = 226 15 *alpha-* or 1- Colorless crystals m 90 soluble in water or alcohol, used in organic synthesis and the manufacture of alpha-naphthol *beta-* or 2- Colorless crystals m 102 soluble in water or alcohol, used in organic synthesis and the manufacture of beta-naphthol **n sulfonic chloride** $C_{10}H_7SO_2Cl$ = 194 6 *alpha-* Colorless tablets, m 67 insoluble in water soluble in alcohol or ether *beta-* Colorless tablets, m 77, insoluble in water, soluble in alcohol or ether Both are used in organic synthesis **n thiol*** Thionaphthol **n yellow** $C_{10}H_5(NO_2)_2OH$ = 234 2 Dinitro-α-naphthol Its calcium salt is the yellow dye, martius yellow

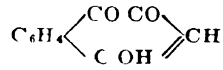
naphthalenediol* $C_{10}H_8O_2$ = 160 1 Dihydroxynaphthalene A group of naphthols **1 2-** m 60 **1 3-** m 125 **1 4-** m 176 **1 5-** m 258 **1 6-** m 138 **1 7-** m 178 **1 8-** m 140 **2 3-** m 159 **2 6-** m 216 **2 7-** m 190

naphthalenedione* Naphthoquinone

naphthalenone $C_{10}H_8O$ = 144 06 Dihydroketonaphthalene A group of ketones of the type



naphthalic acid, 1 8-, or **alpha-** (1) $C_{10}H_6(COOH)_2$ = 216 1 Naphthalene dicarboxylic acid Colorless crystalline needles, slightly soluble in water, alcohol or ether, used in organic synthesis (2) $C_{10}H_6O_3$ = 174 05



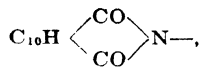
Yellow needles, m 190 (anhydride)

naphthalic acid lactone $C_{10}H_6(CO\ O)_2$ = 214 1 Colorless crystals, m 169, slightly soluble in water

naphthalide (1) A compound of the type $MC_{10}H_7$, as, $Hg(C_{10}H_7)$, mercury naphthalide (2) A compound of the type $RNHC_{10}H_7$, as $CH_3CONHC_{10}H_7$, acetnaphthalide

naphthalidine Naphthylamine

naphthalimido The monovalent radical,



derived from naphthalic acid amide

naphthalin Naphthalene

naphthalize To enrich a gas or liquid with naphthalene, as illuminating gas or gasolene

naphthalol $C_6H_4(OH)COOC_{10}H_7$ = 264 0 Betol, salinaphthol, naphthyl salicylate A colorless powder, insoluble in water, used medicinally as an intestinal antiseptic

naphthamide $C_{10}H_7CONH_2$ = 171 1 Naphthalene carbonamide* **alpha-** Colorless leaflets, m 202, slightly soluble in water or alcohol **beta-** Colorless crystals m 192 soluble in alcohol or ether

naphthamine Hexamethylenamine

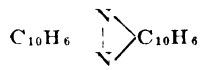
naphthane Dekalin

naphthanthracene Benzanthrene

naphthaquinone Naphthoquinone

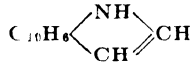
naphthazarine Alizarin black

naphthazin(e) $C_{16}H_{12}N_2$ = 280 2 Anthrapyridine The ring compound

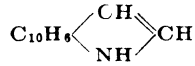


Colorless crystals, m 273

naphthazole $C_{11}H_9N$ = 167 1 Naphthindole The ring compounds

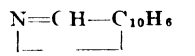


alpha- or 1-



beta- or 3-

peri- $C_{11}H_8N$ = 154 1 The ring system



naphthene (1) A group of cyclic hydrocarbons of the general formula, C_nH_{2n}, also termed cyclo-paraffins or hydrogenated benzenes They occur in Caucasian and Californian petroleums, and are derivatives of cyclopentane and cyclohexane Polycyclic members are also found in the higher-boiling fractions (2) The naphthalene ring system, as, in acenaphthene **mentho-** Menthane

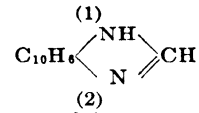
naphthenic acid (1) $C_6H_{11}COOH$ = 128 1 Hexahydrobenzoic acid Colorless crystals, d 1 048, m 38, b 232 slightly soluble in water (2) A group of acids found in some petroleums, derivatives of methyl cyclo-pentanes

naphthenics The undesirable constituents of lubricating oil, which may be separated from the paraffinic hydrocarbons by organic solvents They have steep viscosity-temperature curves

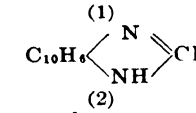
naphthenyl The trivalent radical, $C_{10}H_7C\equiv$

naphthieno The bivalent radical $—C_{10}H_6S—$, attached to two carbon atoms of another ring

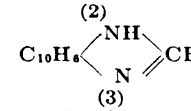
naphthimidazole $C_{11}H_8N_2$ = 168 0 The ring compounds



alpha-



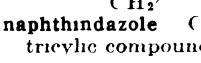
beta-



betabeta-

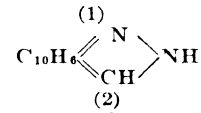
Cf *benzimidazole*

naphthindan $C_{13}H_{16}$ = 168 1 The ring system

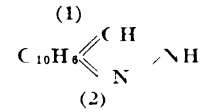


Cf *naphthindene*

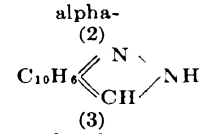
naphthindazole $C_{11}H_8N_2$ = 168 1 A series of tricyclic compounds



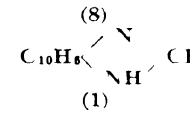
alpha-



beta-



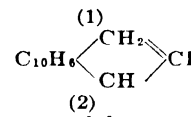
betabeta-



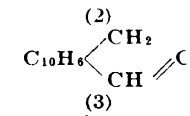
peri-

Cf *naphthisoindazole*

naphthindene $C_{13}H_{10}$ = 166 1 The aromatic hydrocarbon



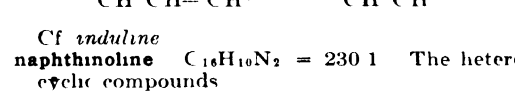
alpha-



beta-

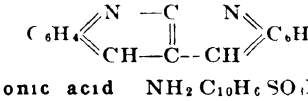
Cf *indene*

naphthinduline $C_{27}H_{18}N_2$ = 370 2 A crystalline coloring material m 250



Cf *induline*

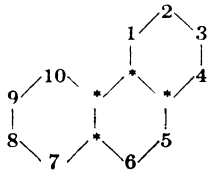
naphthinoline $C_{16}H_{10}N_2$ = 230 1 The heterocyclic compounds



naphthionic acid $NH_2C_{10}H_6SO_3H\ \frac{1}{2}H_2O$ = 232 2 **o-** *1*-Naphthylamine-*2*-sulfonic acid **p-** or 1 4-Naphthylaminesulfonic acid Colorless needles, slightly soluble in water soluble in alcohol, insoluble in ether, decomp by heat Used in the synthesis of dyestuffs and pharmaceuticals

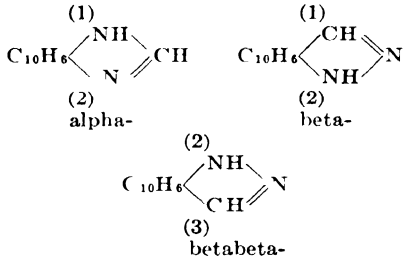
naphthisodiazine $C_{12}H_8N_2$ = 180 1 The ring compounds derived from phenanthrene by the replacement of two carbon atoms by two nitrogen atoms The ten different structural

possibilities are named according to the positions of the two nitrogen atoms in the ring



1 2-naphthisodiazine (or 9 10-)
1 3-naphthisodiazine (or 8 10-)
1 4-naphthisodiazine (or naphthoquinoxaline)
2 3-naphthisodiazine (or 8 9-)
2 4-naphthisodiazine (or 7 9-)
3 4-naphthisodiazine (or 7 8-)
4 7-naphthisodiazine (or pseudophenanthroline)
4 10-naphthisodiazine (or phenanthroline)
5 6-naphthisodiazine (or benzocinnoline)
5 10-naphthisodiazine (or quinoquinoline)

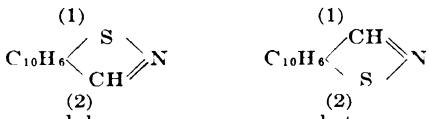
naphthisoindazole $C_{11}H_8N_2$ = 168 1 The ring compounds



Cf *naphthindazole*

naphthisotetrazine $C_{10}H_6N_4$ = 182 2 The ring compound derived hypothetically from phenanthrene (see *naphthisodiazine*) by the replacement of four carbon atoms by four nitrogen atoms The numberings on the ring are the same, *e g*, 1 2 3 4-naphthisotetrazine, 1 4 7 10-naphthisotetrazine

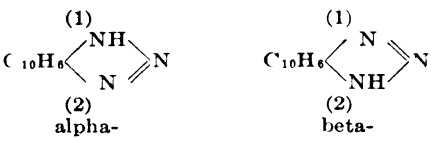
naphthisothiazole $C_{11}H_7SN$ = 169 1 The ring compounds



Cf *naphthothiazole*

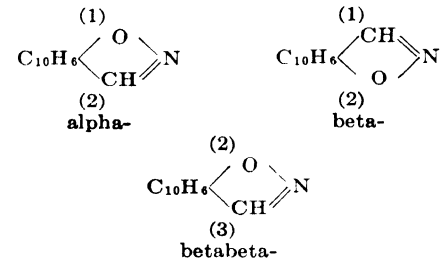
naphthisotriazine $C_{11}H_7N_3$ = 181 2 The ring compounds derived from phenanthrene by the replacement of three carbon atoms of the ring by three nitrogen atoms The positions of the nitrogen atoms are indicated by the numbers (see *naphthisodiazine*), as 1 2 3-1 2 4- or 1 3 4-naphthisotriazine Cf *naphthotriazine*

naphthisotriazole $C_{10}H_7N_3$ = 169 2 The ring compounds



Cf *naphthotriazole*

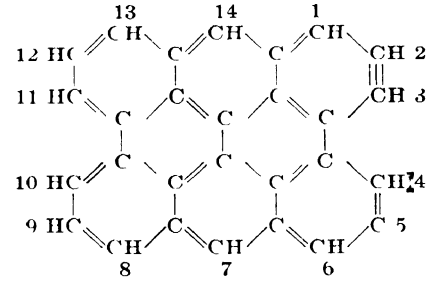
naphthisoxazole $C_{11}H_7ON$ = 169 1 The ring compounds



Cf *naphthoxazole*

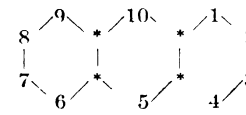
naphtho- A prefix indicating relationship to naphthalene or to its ring structure

naphthodianthrene, meso- $C_{28}H_{14}$ = 350 1 An octocyclic hydrocarbon,



Cf *benzodianthrene*

naphthodiazine $C_{12}H_8N$ = 180 1 The ring structures derived hypothetically from anthracene by replacing two of its carbon atoms by two nitrogen atoms

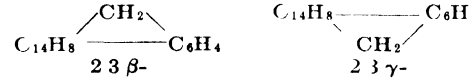


There are six different structures which are designated by the positions of the nitrogen atoms in this ring as follows

1 2-naphthodiazine (or 3 4-, or 6 7- or 8 9-)
1 3-naphthodiazine (or 2 4- or 6 8- or 7 9-)
1 4-naphthodiazine (or 6 9-)
1 9-naphthodiazine (or 4 6-)
1 10-naphthodiazine (or a-quinoquinoline)
5 10-naphthodiazine (or phenazine)

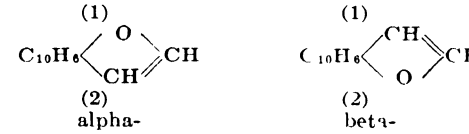
See *naphthisodiazine perinaphthodiazine, benzodiazine*

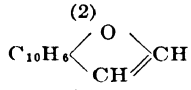
naphthofluorene $C_{21}H_{14}$ = 266 2 A hydrocarbon and ring compound



Cf *benzofluorene*

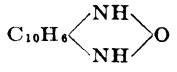
naphthofuran $C_{12}H_8O$ = 168 0 Benzocoumarane The ring compounds





betabeta-

naphthofurazan $C_{10}H_8ON_2$ = 172 2 The ring compound



naphthoic acid $C_{10}H_7COOH$ = 172 1 Naphthalene carboxylic acid **alpha-** Colorless crystals, m 160, slightly soluble in water, soluble in alcohol or ether **beta-** Colorless crystals m 184 slightly soluble in water, soluble in alcohol or ether **nitro-** See *nitronaphthoic acid* **oxy-** See *oxynaphthoic acid*

naphthoic aldehyde $C_{10}H_7CHO$ = 156 1 Naphthyl aldehyde, naphthalene aldehyde **alpha-** Colorless liquid b 292, insoluble in water, soluble in alcohol or ether **beta-** Colorless leaflets, m 60, slightly soluble in water, soluble in alcohol or ether, used in organic synthesis

naphthol $C_{10}H_8O$ = 144 1 Hydroxynaphthalene monoxynaphthalene, naphthyl hydroxide or alcohol, $C_{10}H_7OH$ **alpha-** Colorless monoclinic crystals, d 1 224, m 94, b 278, slightly soluble in water, soluble in alcohol or ether Used in organic synthesis for dyestuffs and pharmaceuticals medicinally as an antiseptic and antifermentative **beta-** Colorless leaflets, d 1 217, m 122, b 285, slightly soluble in water, soluble in alcohol ether or chloroform Used technically in organic synthesis, and medicinally as an antiseptic **acetamino-** See *acetaminonaphthol* **amino-** $C_{10}H_9NO$ = 159 08 NH_2-$C_{10}H_6OH$ 3-*β*- White crystals, m 234 7-*β*- m 163 Cf *helthin* **aminoazobenzene-** Sudan red **anilineazo-** Sudan yellow **benzoyl-** N benzoate **diiodo-** Thymol iodide **dinitro-** See *dinitronaphthol* **lacto-** Lactol **nitro-** See *nitronaphthol* **nitroso-** See *nitrosonaphthol* **sulfo-** See *sulfonaphthol* **thio-** $C_{10}H_8S$ = 160 12 *2*-Naphthalenethiol*, *β*-naphthyl mercaptan, $C_{10}H_7SH$ White shining scales, d 1 550, m 81, b 288, slightly soluble in water **n antipyrine** Naphthopyrine **n aristol** Diiodo-*β*-naphthol **n benzoate** $C_{17}H_{12}O_2$ = 248 09 Benzoylnaphthol, benzonaphthol, naphthylbenzoate, $PhCOOC_{10}H_7$ White crystals *α*- m 56, *β*- m 110, slightly soluble in water **n bismuth** Bismuth *β*-naphthol ate **n blue** Meldola blue **n disulfonic acids** See *sulfonic acids* **n ethyl ether.** Nerolin **n green B** $C_{20}H_{10}O_{10}N_2S_2FeNa_2$ = 604 2 The disodium ferrous salt of nitroso-*β*-naphthol sulfonic acid A green powder, soluble in water **n lactate** Lactol **n methyl ether** Jara-jara **n orange** Tropaeolin **n phthalein** A pH indicator changing from slight pink (pH = 7 3) to green (pH = 8 7), used especially for titrating weak acids in alcoholic solution **n salicylate** Naphthyl salicylate **n sulfonic acid** $HOC_{10}H_6SO_3H$ = 224 2 A group of acids, used in organic synthesis as intermediates for dyestuffs **1 2-** or ortho- Colorless tablets, m 250, soluble in water **2 6-** amphi- or Schaffer's acid Colorless leaflets m 122 soluble in water or alcohol **1 4-** Neville-Winther's acid Colorless crystals, m 170 (decomp) soluble in water **1 5-** Cleves' acid Colorless hygroscopic crystals, soluble in water, alcohol or ether **2 7-** Casella acid Colorless crystals, m 89 soluble in water or alcohol **n yellow** $(NO_2)_2C_{10}H_4(OH)SO_3H$ = 314 2 **2 4-** Dinitro-*α*-naphthol sulfonic acid, S yellow Yellow crystals **n yellow S** $C_{10}H_4O_8N_2SNa$ = 412 21 Citronin The potassium salt is used as a dye for woolen and silken textiles, as a food color and as an oxidation-reduction and pH indicator changing from colorless (acid) to yellow (alkali)

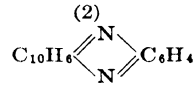
naphtholate A compound derived from naphthol by replacing the hydroxyl-hydrogen by a base

naphtholbenzein $C_{54}H_{38}O_5$ = 766 3 A reddish-brown powder, soluble in alcohol Used as an indicator in volumetric analysis (alkalis—green, acids—orange), but very sensitive to carbon dioxide

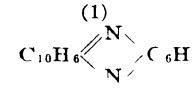
naphthonitrile $C_{10}H_7CN$ = 153 1 Naphthylcyanide, naphthalenecarbonitrile* **alpha-** Colorless needles, d 1 117, m 34, b 296 insoluble in water, soluble in alcohol or ether **beta-** Colorless leaflets d 1 094, m 66, b 304 insoluble in water, soluble in alcohol or ether

naphthophenanthrene Dibenzanthrene

naphthophenazine $C_{16}H_{10}N_2$ = 230 2 Tribenzoparadiazine, benzophenazine, phenonaphthazine The ring compounds



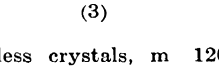
betabeta- m 233



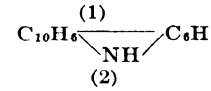
alphabeta- m 142 b exceeds 360

Both are soluble in alcohol, ether or benzene Cf *benzophenazine*

naphthophenocarbazole $C_{16}H_{11}N$ = 217 1 Phenylnaphthylcarbazole Colorless crystals,

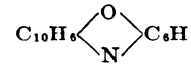


iso- Colorless crystals, m 120, insoluble in water

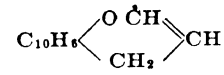


naphthophenothiazine Benzophenothiazine

naphthophenoxazine, 1 6- $C_{16}H_{10}ON$ = 233 2 The ring compound

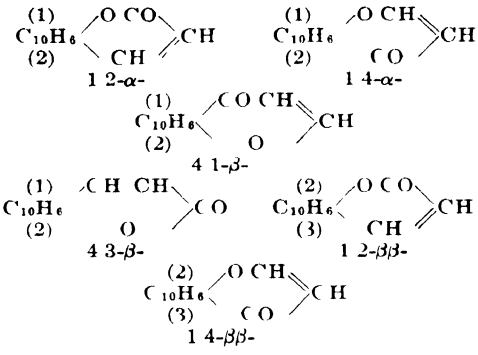


naphthopyrane $C_{13}H_{10}O$ = 182 1 The ring compound



naphthopyrazine Benzoquinoxaline

naphthopyrone $C_{13}H_8O_2$ = 196 1 The ring compounds



1 2-α- 1 4-α-

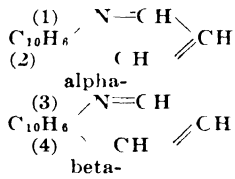
4 1-β-

4 3-β- 1 2-ββ-

1 4-ββ-

naphthoquinaldine $C_{13}H_9N(CH_3)$ = 193 17 **alpha-** A liquid, b exceeds 300 **beta-** A solid, soluble in water, alcohol or ether, m 82, b exceeds 300

naphthoquinoline $C_{13}H_9N$ = 179 1 **alpha-** Colorless crystals Soluble in alcohol or ether and slightly soluble in water, m 52, b 351 **beta-** Colorless crystals, m 93, b $_{740mm}$350, soluble in water, alcohol or ether

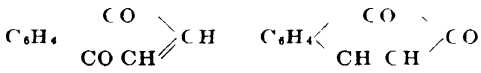


alpha-

beta-

octohydro-α-, 1 2 3 4 7 8 9 10-octohydro-α-naphthoquinoline Colorless crystals m 48, b 216 **octohydro-β-,** 1 2 3 4 5 6 7 8-octohydro-b-naphthoquinoline Colorless crystals, m 325, b 325 **tetrahydro-α-,** 1 2 3 4-tetrahydro-a-naphthoquinoline Colorless crystals, m 46 **tetrahydro-β-** Colorless crystals, m 63

naphthoquinone $C_{10}H_6O$ = 158 1 Dihydrodiketonaphthalene **alpha** or **1 4-** Yellow crystals, m 125, slightly soluble in water, soluble in alcohol or ether **beta** or **1 2-** Red needles, decomp 115, soluble in water, alcohol, chloroform or ether, used as test for resorcinol and thalline **amphi-** or **2 6-** Orange crystals, changing to gray at 130-135



1 4- or alpha- or para- *1 2-* or beta- or ortho-

n dioxime $C_{10}H_8O_2N$ = 174 1 A group of derivatives of naphthoquinone formed by replacing the =CO groups by =CN OH groups Alpha-compound, m 207 *5-***hydroxy-** Tuglone

naphthoquinoxaline *1 4-*Naphthisodiazine

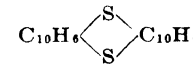
naphthoresorcinol $C_{10}H_8O_2$ = 160 0 *1 3-*Dihydroxynaphthalene, naphthalenediol* Colorless crystals m 124, soluble in water, used as reagent for aldehydes, sugars and uronic acids

naphthosalol Betol

napthosultone See *naphsultone*

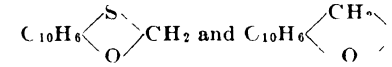
naphthotetrazine $C_{10}H_6N_4$ = 182 2 The ring structures derived theoretically from anthracene by the replacement of four carbon atoms by four nitrogen atoms According to the position of the nitrogen atoms the compounds are numbered 1 2 3 4-, 1 4 6 9-, or 1 4 5 10-naphthotetrazine (see *naphthodiazine*) Cf *naphthisotetrazine*

naphthothianthrene $C_{20}H_{10}S_2$ = 316 3 The ring compound



naphthothiazole $C_{11}H_7NS$ = 185 2 Ring compounds similar in structure to the corresponding naphthoxazoles, the O of the latter being replaced by an S-atom For structure of a- aa- b-, and bb-, see *naphthoxazole*

naphthothioxole $C_{11}H_7OS$ = 187 1 The ring compounds



[1 2-] [2,1-]

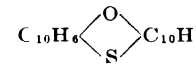
naphthotriazine $C_{11}H_7N_3$ = 181 2 Ring compounds similar to the naphthodiazines, but having one more nitrogen atom in place of a carbon atom The position of N-atoms is indicated by numbers as 1 2 3-, 1 4 9-, and 1 4 10-naphthotriazine (see *naphthodiazine*) Cf *naphthisotriazole*

naphthotriazole $C_{10}H_7N_3$ = 169 2 The ring compounds (cf *naphthisotriazole perinaphthotriazole*)

alpha- beta-

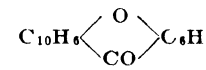
naphthoxanthene Benzoxanthene

naphthoxanthine $C_{20}H_{12}OS$ = 300 2 The ring compound



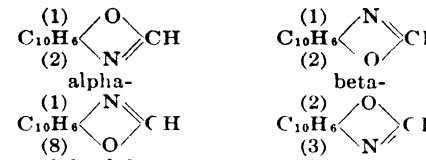
Cf *phenothioxthine*

naphthoxanthone $C_{17}H_{10}O_2$ = 246 1 The ring compound



naphthoxazine Phenoxazine

naphthoxazole $C_{11}H_7ON$ = 169 1 The ring compounds

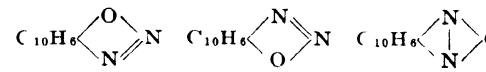


alpha- beta-

alphaalpha- betabeta-

Cf *naphthisoxazole, naphthothiazole benzoxazole*

naphthoxdiazole $C_{10}H_6ON_2$ = 170 1 The ring compounds



alpha- beta- iso-

Cf *benzoxdiazole*

naphthoxy The monovalent radical, $C_{10}H_7O$— derived from naphthol

naphthoyl The monovalent radical, $C_{10}H_7CO$—, derived from naphthoic acid

naphthyl The monovalent $C_{10}H_7$— radical derived from naphthalene **di-** See *dinaphthyl* **n acetate** $CH_3COOC_{10}H_7$ = 186 1 *alpha-* Colorless needles, m 130, slightly soluble in water, soluble in alcohol or ether *beta-* Colorless needles, m 142 insoluble in water, soluble in alcohol or ether **n acetic acid** $C_{10}H_7CH_2COOH$ = 186 1 *alpha-* Colorless crystals, m 131 *beta-* Colorless crystals, m 139 **n alcohol** Naphthol **n acetylene** $C_{12}H_8$ = 152 1 *alpha-* A liquid, b ^{745mm}143 *beta-* white crystals, m 36, soluble in alcohol, ether or acids **n aldehyde** Naphthoic aldehyde **n amine** See *naphthylamine* **n benzene** A hydrogen ion indicator changing at pH 8 0 colorless (acid) to blue (alkaline) **n benzoate** Naphthol benzoate **n carbinol** $C_{10}H_7CH_2OH$ = 158 1 Naphthobenzyl alcohol *alpha-* Colorless crystals, m 60, b 301, soluble in alcohol *beta-* Colorless crystals, m 80 **n cyanide** Naphthonitrile **n ether** $(C_{10}H_7)_2O$ = 270 2 N oxide, naphthoxy-naphthalene*, *alpha-* or *1 1 -* Colorless crystals, m 110, b 360, insoluble in water, soluble in alcohol or ether *beta-* or *2 2-* Colorless crystals, m 105, b 360, insoluble in water, but soluble in alcohol or ether **n ethyl ether** *α-* See *ethyl naphthyl ether* *β-* Bromelia **n hydrazine** $C_{10}H_7NHNH_2$ = 158 1 *alpha-* Colorless leaflets, m 117 *beta-* Colorless leaflets, m 125 Both are slightly soluble in water, soluble in alcohol or ether The hydrochlorides are used as reagents for sugars **n hydroxide** Naphthol **n isocyanate** $C_{10}H_7NCO$ = 169 0 Colorless crystals used as reagent for hydroxy and amino compounds **n ketone** $(C_{10}H_7)_2CO$ = 282 1 *alphabeta-* Colorless needles m 135, insoluble in water, soluble in alcohol or ether **n lactate** Lactol **n mercaptan** $C_{10}H_7SH$ = 160 17 Thionaphthol A liquid, insoluble in water, decomp 285 **n methyl ether** $C_{10}H_7OCH_3$ = 158 1 Methoxynaphthalene* *α-* Colorless liquid, d 1 096, m below −10, b 258 *β-* Yara-yara, neroli A colorless powder of fruit-like odor, m 78, b 274, insoluble in water, soluble in alcohol or ether Used in perfumery and in synthetic perfumes **n methyl ketone** $C_{10}H_7CO Me$ = 170 1 *alpha-* Acetonaphthone Colorless crystals, m 34, b 295, soluble in alcohol **n salicylate** α- Alphol β- Betol

naphthylamine $C_{10}H_7NH_2$ = 143 1 Naphthalidine **alpha-** Colorless needles, d $^{25°}$1 123, m 50, b 300, slightly soluble in water, soluble in alcohol or ether Used in organic synthesis in the manufacture of Martius yellow, magdala red, and other dyestuffs, also as a reagent for nitrites and nitrates **beta-** Colorless leaflets, d $^{98°}$1 0614, m 111, b 306, soluble in water, alcohol, or ether, used in organic synthesis, in the manufacture of azo-dyes **acet-** Acetnaphthalide **dimethyl-β-** $C_{10}H_7NMe_2$ = 171 11 Colorless crystals, m 46, b 305 **ethyl-α-** $C_{10}H_7NHEt$ = 171 11 A colorless liquid b 303 **methyl-α-** $C_{10}H_7NHMe$ = 157 10 A colorless liquid, b 293 **nitro-** See *nitronaphthylamine* **nitroso-** q v , **phenyl-** q v , **tetrahydro-** q v **thiophenyl-** Benzophenothiazine

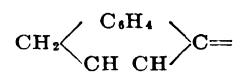
n brown Acid brown 4-sulfo-α-naphthalene-azo-α-naphthol An indicator for the pH range 6 0 (orange)-8 4 (pink) **n hydrochloride** $C_{10}H_7NH_2HCl$ = 179 6 *alpha-* Colorless needles, soluble in water, alcohol, or ether, used as an intermediate in organic synthesis *beta-* Colorless leaflets, soluble in water, alcohol, or ether, used in organic synthesis **n sulfonic acid** A compound derived from naphthalene by substitution of one hydrogen by —NH_2, and another H by —SO_2OH There are 13 isomeric monosulfonic acids $C_{10}H_6(NH_2)SO_3H$, 20 isomeric disulfonic acids $C_{10}H_5(NH_2)(SO_3H)_2$, and 10 isomeric trisulfonic acids, $C_{10}H_4(NH_2)(SO_3H)_3$ The more important are

1 4-naphthylamine sulfonic acid, see *naphthionic acid*
2 8-naphthylamine sulfonic acid, Baden acid or α-acid
2 6-naphthylamine sulfonic acid, Brönner's acid, or β-acid
2 5-naphthylamine sulfonic acid, Dahl's acid or γ-acid
2 7-naphthylamine sulfonic acid, F-acid, δ-acid or Bayer acid

naphthylene (1) The bivalent radical, $C_{10}H_6$=, derived from naphthalene (2) An obsolete name for cyclohexene, C_6H_{10} **di-** Perylene **perieethylene-** Acenaphthene

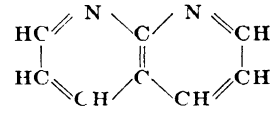
n diamine $C_{10}H_6(NH_2)_2$ = 158 1 Diaminonaphthalene, naphthalenediamine There are several compounds, all colorless crystals 1 2-naphthylene diamine, m 98, 1 3-naphthylene diamine m 95, 1 4-naphthylene diamine, m 120, 2 3-naphthylene diamine, m 191

naphthylidene The bivalent radical,



naphthylmercuric The monovalent radical $C_{10}H_9Hg$— **n acetate** $CH_3COOHgC_{10}H_9$ = 388 70 Colorless fine needles, m 154, insoluble in water **n chloride** $C_{10}H_9HgCl$ = 356 14 Silky, quadratic crystals, m 188, insoluble in water

naphthyridine $C_8H_6N_2$ = 130 06 *1 8-*benzodiazine, q v , *1 8-*pyridopyridine The ring compound



Cf *benzodiazine*

octohydro- $C_8H_{14}N_2$ = 138 2 Colorless crystals, m 227

naphtol Naphthol

Napier, John 1550–1600 A Scotch mathematician, the inventor of logarithms

Napierian logarithms The exponent of the power to which the quantity e (= 2 71828) must be raised in order to produce a given number See *logarithms*, '*e*"

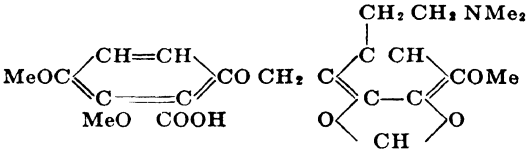
napiform Having the form of a turnip The turnip-shaped cavities seen in culture media that have been liquefied by bacteria

Naples jar A glass jar for staining microscope slides **n yellow** Lead antimoniate

napoleonite Corsite

naptha Naphtha

narceine $C_{23}H_{27}O_8N\,3H_2O$ = 499 4 An alkaloid from opium Colorless prisms, m 170, slightly soluble in water or alcohol Used medicinally as a hypnotic and sedative



ethyl- Narcyl **n. hydrochloride** $C_{23}H_{27}O_8N$ - HCl = 535 7 White, granular powder, m - 190, soluble in water, alcohol, or ether, used as a hypnotic **n meconate** $C_{23}H_{27}O_8N$ - $C_7H_4O_7$ = 699 4 Yellow crystalline needles, m 126, soluble in hot water or alcohol **n sodium salicylate** Antispasmin **n sulfate** $C_{23}H_{27}O_8N$ H_2SO_4 = 595 3 Yellowish crystals, soluble in water or alcohol **n valerate** $C_{23}H_{27}O_8N$ $C_5H_{10}O_2$ = 601 5 A greenish-white powder, decomposes on ageing soluble in hot water or alcohol

narcine Narceine

narcissine Lycorine

narcophine A double salt of morphine and narcotine meconate

narcosan A solution of the lipoids from soya beans and cotton seeds (extracted with hot alcohol), the non-specific proteins from alfalfa seeds (extracted with dilute HCl), and the water-soluble vitamins from plant seeds (percolated with physiological salt solution) Used for nervous disorders and drug addiction

narcotic A drug that produces stupor, complete insensibility, or sleep, as opium, chloral cannabis Three chief groups

opium group—which produce sleep

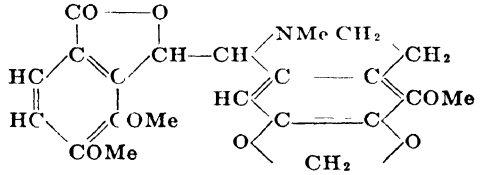
belladonna group—which produce illusions and delirium

alcohol group—which produce exhilaration and sleep

Cf *Meyer's theory* **n poison** A n which produces stupor or delirium

Narcotic Act See *Harrison Narcotic Act*

narcotine $C_{22}H_{23}O_7N$ = 413 3 Opianine An alkaloid from opium,



Colorless needles, m 176, insoluble in water, slightly soluble in alcohol or ether Used medicinally as an antipyretic and tonic, and has little narcotic effect Cf *cotarnine*

narcyl $C_{25}H_{31}O_8N$ HCl = 509 7 Ethylnarceine hydrochloride Colorless crystals, slightly soluble in water, soluble in alcohol

narcylene A pure acetylene gas, used as an anesthetic gas

nard Aralia

naregamine An alkaloid from the root of *Naregamia alata*, Goanese ipecac, used as an emetic

nargol Silver nucleinate

naringenin $C_{15}H_{12}O_5$ = 272 09 4 5 7-trihydroxyflavanone A synthetic flavone, q v

naringin $C_{21}H_{22}O_{11}$ = 454 2 Aurantium A crystalline glycoside from the flowers of *Citrus decumana*, the grapefruit or pomelo tree Yellow prisms, soluble in hot water or hot alcohol insoluble in ether It hydrolyzes to naringenin

narki metal An alloy of iron and silicon, use in acid resisting utensils

nascency Nascent state

nascent Describing a chemical substance at th moment of its formation, especially a gas at th moment it is generated in which conditio it is more chemically-active, presumably o account of free single *atoms* being present instead of the less active gas *molecules* **n state** The condition of a substance during it formation, or liberation from its compound (see *status nascendi*)

nasrol Symphorol N

naszogen process The production of oxyge from a mixture of a chlorate, inert substanc (as, kieselguhr) and an exothermic compound

natalite A mixture of alcohol and ether, used a fuel in internal combustion motors

nataloin $C_{34}H_{38}O_{15}$ = 686 3 A principle de rived from Natal aloes Cf *aloin*

National Physical Laboratory An English Gov ernment institution near London, which issue certificates for scientific glassware, weights, an measuring instruments having a specified hig degree of accuracy, and carries out physica research Certified articles bear a monogra N P L

National Research Council An institution estab lished in April, 1916 by the National Academ of Sciences in Washington (U S A) for th better coordination of research in industri problems

native A pure substance occurring in natur The term is used (a) to indicate an uncombine element, as native mercury or native gold, an (b) to distinguish substances which occu naturally, from those artificially made, as nativ garnet, native soda **n coke** Carbonite **n compounds** A chemical compound that occu in nature **n element** A chemical elemen that occurs uncombined in nature **n meta** A metal that occurs uncombined in natu as copper, silver, gold **n paraffin** Ozocerit **n prussian blue** Vivianite **n soda** Natro

natrine An alkaloid from *Solanum tomatillo*, Solanaceae

natrium The Latin and German names fo sodium, Na

natrocalcite Gaylussite

natrolite $Na_2O,Al_2O_3,3SiO_2,2H_2O$ Needl stone A white or yellow zeolite mineral o sodium aluminum silicate Cf *radiolite*

natron Na_2CO_3 $10H_2O$ A native sodium car bonate, occurring in the desert regions o Egypt, from which the term natrium (sodium has been derived (Cf *trona, urao*)

natronkalk Soda-lime

natrum An early (Arabic) name for trona Cf *natrium*

natural Not artificial or synthetic **n bases** Alkaloids **n changes** (1) The reactions pro duced by decay, fermentation, or putrefactio of organic compounds (2) The reaction produced by decomposition, corrosion, oxida tion and hydrolysis of inorganic compound **n dyes** The coloring materials derived fro the vegetable or animal world, as indigo o carmine **n gas** (1) An almost pure mixtur of hydrogen and methane gas or a mixture o simple hydrocarbon homologs found in th vicinity of oil fields Typical compositions are

	Eastern, per cent	Western, per cent
Hydrogen	20	
Methane	70	70
Other hydrocarbons	6	27
Carbon dioxide	1	3
Nitrogen, oxygen	3	

It is collected at the oil fields, and piped to the cities to be used as fuel An odorous substance is usually added as a warning aid in detecting leaks (2) Helium **n immunity** The resistance of species or races to certain infectious diseases *E g*, Man is never attacked by chicken cholera **n logarithm** Napierian logarithm **n philosophy** The interpretation of natural science by theories and abstract concepts It includes theoretical chemistry and theoretical physics Cf *natural science* **n science** The knowledge of the phenomena of nature, as opposed to abstract or philosophical science Natural science is mainly descriptive and is conveniently classified into descriptive chemistry and physics, descriptive biology (botany, zoology and anthropology), descriptive geology (topography, oceanography, and meteorology), and descriptive astronomy (Cf *natural philosophy*) **n ventilation** The ventilation of a mine by natural means

naucleine $C_{21}H_{26}O_4N_2$ = 370 2 An alkaloid obtained from *Nauclea excelsa*, a Japanese plant, used as a cure for the opium habit

nauli gum An oleoresin from *Canarium commune*, a tree of the Solomon Islands **n oil** An essential oil of anise-like odor, distilled from nauli gum Cf *elemi*

naumannite A native lead-silver telluride, $(Ag_2Pb)Se$, large cubes with a metallic luster

nauseant An agent that produces a feeling of sickness and vomiting

nautical mile A measure of distance equal to 1 15136 statute miles = 6082 66 feet **n speed** See *knot*

naval brass An alloy of 61 parts Cu, 38 parts Zn, and 1 pt Sn **n stores** (1) A group name for the materials originally used by builders of wooden ships, such as, tar, pitch, rosin, turpentine, asphalt, pine oil (2) The products obtained from rosin, as, turpentine, pine oil

Navashin's solution A fixative for plant tissues consisting of equal parts of (a) (1 5 % CrO_3, 10 % CH_3COOH, 90 % H_2O), (b) (40 cc formaldehyde, 60 cc H_2O)

Nb The symbol for niobium (columbium)

Nd The symbol for neodymium

Ne The symbol for neon

neat's-foot oil Oleum bubulum A liquid oil of varying composition obtained by boiling calves' and sheep's feet and shinbones A pale yellow oil, d 0 916, soluble in alcohol, ether, benzene, or chloroform Used as a lubricant, leather dressing, and for oiling wool

nebulium A hypothetical light element, atomic weight 1 31 It is assumed (from spectroscopic evidence) to exist in nebulas, but its characteristic lines are due to doubly- and triply-ionized oxygen and doubly-ionized nitrogen Cf *coronium, aurorium*

nebulization The transformation of a liq into a fine spray

nebulizer An atomizer or instrument for p ducing a spray

necic acids The acid products of hydrolysis senecio alkaloids

necines The basic products of hydrolysis senecio alkaloids

necrocryptoxanthol A provitamin A in yell corn grain

nectandrine $C_{26}H_{23}O_4N$ = 341 3 An alkal from the bark of *Nectandra rodiaei*, a Laurace A white amorphous powder resembling bebeer in action

nectar The sugary juice of flowers, and source of honey

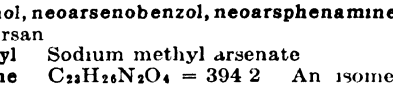
needle (1) A sharp pointed rod of metal puncturing or sewing (2) A needle-sha crystal (3) A magnetic needle **astatic-** *astatic* **compass-** A magnetized need mounted so that it can move freely in a h zontal direction **dipping-** A magnetized nee hung so that it can move freely in a verti plane **hypodermic-** A hollow needle, u for the injection of solutions beneath the sk **n ore** (1) An iron ore, which occurs in l fibrous filaments (2) Aikenite A native s fide of lead, bismuth, and copper **n sp** Aragonite **n stone** Natrolite **n val** A screw-valve with a long tapering point stead of a disk, used on high pressure cylinders

neem n bark Azadarach **n oil** Marg oil, nim oil An oil expressed from the se of *Melia azadirachta*, containing various sul compounds Used medicinally for syphi as an anthelmintic, and as a denaturant alcohol Cf *margosa* oil, *margosic* acid

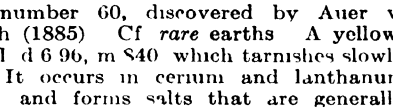
negative (1) Having a charge due to electro as a negative ion or radical (2) The absence a reaction, property or phenomenon, as, negat catalysis or negative crystal (3) The oppos of positive, as a photographic negative **catalysis** The retardation of a chemi reaction by means of a catalyst **n cotton** low-nitrated cellulose, soluble in ether or alcoh used for photographic plates **n cryst** A birefractive crystal in which the refract index of the ordinary ray is more than refractive index of the extraordinary ray **electrode** Cathode **n element** An ac forming element or an atom with four to se valency electrons, as C = 4, N = 5, O = Cl = 7 It is characterized by tendency attract additional electrons and form a sta system of eight Cf *octet, negative ion, perio system* **n group** (1) An acid radical (2) radical, the introduction of which into a mo cule, causes an organic compound to beco more negative, that is, become less basic a so enable the hydrogen atoms to be replaced by metals Such negative radicals are c bethoxyl-, carboxyl-, naphthyl-, nitro-, nitros phenyl-, and thionyl-groups **n ion** An at charged with one or more negative electri an anion **n plate** A photographic plate which, on exposure to light and subseque development and fixation, the image is inverte light appears black, and shadows white **radical** An acid radical **n test** A reacti or test which indicates the absence of t substance sought

negatron A negative electron (q v) as co pared with the positron

negion Proposed name for cation Cf *posion*
negode Proposed name for cathode, q v
nemalite Brucite
nematic Pertaining to liquid crystals of the thread-like type Cf *smectic*
nembutal Pentobarbital
neo- A prefix derived from the Greek, indicating new' or "recent '
neoarsaminol, neoarsenobenzol, neoarsphenamine Neosalvarsan
neoarsycodyl Sodium methyl arsenate
neobrucidine $C_{23}H_{26}N_2O_4$ = 394 2 An isomer of brucidine
neobrucine $C_{23}H_{26}N_2O_4$ = 394 2 An isomer of brucine
neocaine Procaine
neocerotic acid $C_{25}H_{50}O_2$ = 382 4 A fatty acid, m 77 8 from bees-wax
neocianite The blue mineral CuO,SiO_2
neocinchophen Novatophan A cinchophen derivative used similarly to that compound in medicine
neocryl Succinanilomethylamide-*p*-arsonic acid A drug used for the treatment of syphilis and sleeping sickness
neocupferron The homologous napthyl derivative of cupferron (q v) It is a reagent for iron
neocyanine A dyestuff derivative of cyanine, used as a photographic sensitizer for infrared
neodiarsenol Neosalvarsan
neodymia Neodymium oxide See also *didymia*
neodymium Nd = 144 27 A rare earth metal, atomic number 60, discovered by Auer v Welsbach (1885) Cf *rare earths* A yellowish metal d 6 96, m 840 which tarnishes slowly in air It occurs in cerium and lanthanum minerals and forms salts that are generally purple colored and fluorescent Its valency is 3 **n acetate** $(CH_3COO)_3Nd\ H_2O$ = 339 36 Pink crystals, soluble in water **n acetylacetonate** $Nd(MeCOCH_2COO)_3$ = 441 43 Violet crystals m 120–125, soluble in water **n chloride** $NdCl_3$ = 250 65 Rose crystals soluble in water **n hydroxide** $Nd(OH)_3$ = 195 29 A reddish-white powder, insoluble in water **n iodide** NdI_3 = 525 07 A purple crystalline powder, soluble in water **n oxalate** $Nd_2(C_2O_4)_3$ = 732 70 Rose crystals, insoluble in water **n oxide** Nd_2O_3 = 336 54 A pale blue powder, insoluble in water **n phosphate** $NdPO_4$ = 239 29 A red powder, used as an amethyst coloring for porcelain **n sulfide** Nd_2S_3 = 384 72 A yellowish-green powder, d 5 387, m 2200
neoform $Bi(OH)_2C_6H_2I_3$ = 697 0 Basic triiodophenol bismuth A yellow powder, insoluble in water, used medicinally as a dusting powder
neogen A silver-white alloy 58 parts copper 27 parts zinc, 12 parts nickel, 2 parts tin, 0 5 part of aluminum and bismuth
neohexane *2 2*-Dimethylbutane*
neokharsivan A British-made brand of neosalvarsan
neolactose An isomer of lactose
neoline $C_{23}H_{39}O_6N$ = 425 2 An alkaloid obtained by hydrolysis of neopelline
neolite A green, silky, fibrous, aluminum-magnesium silicate
neolithic Late Stone Age Pertaining to an epoch in human civilization characterized by the beginning of agriculture, discovery of fire, and better implements of stone and bone It was preceded by the paleolithic age and followed by the copper and bronze age
neon Ne = 20 183 A rare, noble gaseous element, atomic number 10, discovered in the atmosphere in 1898 by Ramsay and Traver A colorless gas $d_{H=1}$ 9 96, m −253, b −24 It occurs in the air in traces (1 in 55,000) and consists of two isotopes (atomic weight, 20 and 22) It forms no chemical compounds, and is used as a residual gas in vacuum tubes (*e g* , in spark plug testers, and sources of illumination for spectroscopic work), and incandescent lamps **n lamp, n light, n tube** A vacuum tube containing a trace of neon It emits an intense red light of great fog-penetrating power used for advertising signs and beacons for airways and lighthouses
neonal $C_{10}H_{14}O_3N_2$ = 210 12 5-butyl-5-ethyl barbituric acid, sonervl



, m 124–127, used as hypnotic Cf *barbital, allonal*
neonicotine Anabasine
neopelline $C_{32}H_{45}O_8N$ = 571 36 An alkaloid from *Aconitum napellus*, aconite
neopentane *2 2*-Dimethylpropane
neoprene Duprene
neosalvarsan $C_{10}H_{11}O_6N_2As_2(CH_2)O\ SONa$ 466 2 Neoarsaminol, neoarsphenamine, neoarsenol, Ehrlich No 914, novarsenobenzol sodium-3 3'-diamino-4 4'-dihydroxy-arsenbenzol-methanal-sulfoxylate,



A product of salvarsan and formaldehyde sodium sulfoxylate discovered by Ehrlich and Berthei in 1912 An orange-yellow powder, with peculiar odor, very soluble in water, used f intravenous and intramuscular injections
neosine A nitrogenous base from muscle
neostibosan The diethylamine salt of stibanic acid It is similar in action, and preferable stibosan, q v
neostrychnidine $C_{21}H_{24}N_2O$ = 296 15 An isomer of strychnidine
neostrychnine $C_{21}H_{22}N_2O_2$ = 334 15 An isomer of strychnine
neosynephrine $C_9H_{13}NO_2$ = 167 1 Levo-hydroxy-*β*-methylamino-3-hydroxy ethylbenzene White crystals, used as a vasoconstrictor q v
neothesine $C_{16}H_{23}NO_2\ HCl$ = 297 7 *γ*-(methylpiperidino) propyl benzoate hydrochloride, $PhCOO(CH_2)_3N\ (CH_2)_4CHMe\ HCl$

White crystals, m 172, soluble in water, alcohol or chloroform, used as local anesthetic C *procaine, cocaine* **n base** A yellow oil, soluble in water
neotype Alstonite
neoytterbium Ytterbium
nepalin $C_{17}H_{14}O_4$ = 282 11 A crystalline constituent from the *Rumex* species, Polygonaceae Cf *nepodin*
nepheline A granular rock, which consists chiefly of nephelite and pyroxene
nephelite (1) An orthosilicate of sodium, potassium, and aluminum consisting of 20 % K_2SiO_4, 75 % $NaAlSiO_4$, and 5 % $NaAlSi_2O_8$ is the basis of many rocks (2) $NaAlSiO_4$ Elaeolite A silica mineral (q v) typical of a group Cf *beemerose*

nephelometer A photometric or optical device for determining the amount of suspended matter in a solution by comparison of the amount of light scattered by the suspended particles with that scattered by the particles of a standard suspension It is used to determine proteins, the growth of bacteria, and any metallic or acid radicals which can be precipitated in finely-divided form Cf *turbidimetry*

nephelometry Quantitative analysis by determining the degree of light scattered from a fog or suspension Cf *turbidity*

nephrite Jade

nepodin $C_{18}H_{16}O_4$ = 296 12 A principle, m 158, from *Rumex nepalensis*, a Polygonaceae Cf *nepalin*

neptunium A supposed element of atomic weight 118, which proved to be a mixture of tantalum and niobium

neral β-Citral

neriantin A crystalline glucoside from the leaves of *Nerium oleander*

nerin A glucoside from the leaves of *Nerium oleander*, an Apocynaceae, soluble in water or alcohol, insoluble in ether, which resembles strophantin and has a digitalis-like action Cf *oleandrin*

neriodorin A glucoside from the bark of *Nerium odorum*

nerium Oleander

Nernst, Walter 1864–1942 A German physicist and chemist, noted for his work in thermodynamics and physical chemistry **N effect** The thermomagnetic difference in potential observed on passing a current from left to right through a metallic plate placed between two magnetic poles The effect is positive when the upper edge of the plate has the higher potential **N heat theorem** The entropy of a condensed, chemically-homogeneous substance vanishes at the zero of absolute temperature **N lamp** See *lamp* **N law** Partition law Distribution law, Nernst theorem A substance in contact with two immiscible liquids and soluble in both, will dissolve in each of the two liquids in fixed proportions, regardless of the quantity of liquid, providing no molecular association or electrolytic dissociation takes place **N theory** (1) The electric stimulus to the tissues of an organism is due to the dissociation of the salts, as a result of which a concentration of ions is produced in the solution surrounding the cell membranes (2) The theory of electrolytic solution pressure (q v), according to which the potential of a metal in a solution of its ions may be calculated from a knowledge of the concentration of the latter The potential is set up as a result of the tendency of the metal to go into solution with the formation of ions

nerol $C_{10}H_{18}O$ = 154 14 A primary alcohol derived from neroli oil A colorless liquid, d 0 881, b 226

neroli oil A brown, essential oil distilled from orange blossoms, *Citrus bigardia* and *C aurantium*, d 0 87, containing nerol, linalool, geraniol, and limonene, used in perfumery

nerolidol $C_{15}H_{26}O$ = 222 20 Peruviol, *3 7 11*-trimethyldodecatriene-*1 6 10*-ol-3 Me_2C CH-$(CH_2)_2CMe$ $CH(CH_2)_2CMeOH$ CH CH_2 A tertiary alcohol from neroli oil and Peru balsam, d 0 880, b 277 It is an isomer of farnesol, used in perfumery

nerolin (1) $C_{10}H_7O C_2H_5$ = 172 1 β-naphthylethylether (2) $C_{10}H_7O CH_3$ = 15 β-naphthylmethylether A colorless crystal powder of fruity odor, m 72, b 271, insolubl water, soluble in alcohol or ether, used a substitute for nerol in perfumery

nerve A fiber-like whitish cord, which transmits impulses to and from the central nervous system **n sedative** An agent that diminishes the activity of sensory nerves, as chlo bromides, belladonna, opium, henbane **n stimulant** An agent that increases the activity of sensory nerves, as nux vomica, strychn caffeine

nervocidine An alkaloid from an Indian p (gasu-basu) It forms a yellow amorph powder, soluble in water, used as a l anesthetic in dentistry

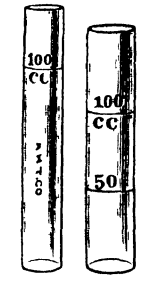
nervon $C_{48}H_{91}NO_8$ = 809 74 A galactos m 61, containing nervonic acid, sphingo and galactose occurring in the brain *cerebroside*

nervonic acid $C_{24}H_{46}O_2$ = 366 36 Selachc acid, *6,15*-tetracosanic acid The unsatura acid, $Me(CH_2)_7CH$ $CH(CH_2)_{13}COOH$ W crystals, m 41, insoluble in water, in fish l oils nervon and sphingomyelin **α-hydr** $C_{24}H_{46}O_3$ = 382 36 An acid from hydr nervone

Nesbitt tube A glass apparatus for the abs tion of CO_2 in soda-lime, used in the determ tion of carbon in steel

nesquehonite A hydrous magnesium carbon $MgCO_3 3H_2O$

Nessler, A 1827–1905 A German che noted for his development of analytical meth **N reagent** Dissolve 3 5 gm KI in 10 H_2O (Sol A), and 1 7 gm $HgCl_2$ in 30 cc (Sol B) Slowly add B to A until a permanent precipitate occurs, then dilute with 20 % NaOH to 100 cc Again add solution B until a permanent precipitate forms, let settle, decant and keep solution in the dark The solution improves on keeping **N's solution** An alkaline mercuric potassium iodide solution See *Nessler's reagent* \ *test* **N's test** A delicate test for detecting ammonia, aldehydes, and hexamethylenamine N rea gives a reddish brown precipitate with amm and with traces of NH_3 a more or less int yellow tint due to NHg_2I, which can be use its colorimetric determination 1 part per 1 000,000 of water is detectable **N tube** glass cylinder with a flat bottom, used for comparison of colors in colorimetric rea analysis

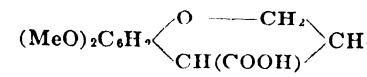


Nessler tube

nesslerize To treat with Nessler's reagent

nether An early (Egyptian) name for trona

netoric acid $C_{12}H_{14}O_5$ = 218 08 A mono boxylic acid, m 92, derived from rotenol



nettle Urtica **horse-** *Solanum carolinense*,

Neuberg ester Fructose-*6*-monophosphate, duced in the fermentation of sugar by ye Cf *Robison ester*

neudorfite $C_{18}H_{28}O_2 = 276.2$ A resinous oxidized hydrocarbon in Bavarian coal beds

neuridin $C_5H_{14}N_2 = 102.2$ A ptomaine found in decaying animal matter

neurine $C_5H_{13}ON = 103.4$ Amantine Trimethylvinylammoniumhydroxide A quaternary amine $(CH_3)_3\equiv N\langle^{CH\ CH_2}_{OH}$, in decaying proteins from fishes, fungi, and brain substances An extremely poisonous liquid known in solution only, soluble in water alcohol or ether (See also *choline*, *amanitine*, *muscarine*) **oxy-** Betaine

neurodin $C_{18}H_{16}O_3N = 282.12$ Acetyl-p-oxyphenylurethane $C_6H_4(OCOCH_3)_2NHCOOC_2H_5$ A colorless crystalline powder soluble in water used medicinally as an antineuralgic and antipyretic

neurodine $C_5H_{19}N_2 = 107.1$ A ptomaine in decomposing flesh

neurolecithin An ester of fatty acids with glycerophosphoric acid and choline prepared from the brain and spinal cord of healthy animals and used medicinally as a lecithin preparation Cf *lecithin*

neuron A nerve cell

neuronal $C_6H_{11}ONBr = 194.0$ Diethyl bromacetamide, bromodiethylacetamide, $NH_2CO\text{-}CBrEt_2$ Colorless crystals, m 66, soluble in water, used medicinally as a somnifacient

neurosin Calcium glycerophosphate

neurotic An agent or substance acting on the nervous system (see *poisons*)

neuton The theoretical zero element, consisting of neutrons, ${}_0n^1$, having atomic number zero and mass one Cf *neutron*

neutral (1) Non-acidic and non-basic Cf *amphoteric* (2) Having no free electric charge Cf *neutron*, *isoelectric point* **n atom** An atom in which the nuclear positive charge is balanced by the negative electrons, but the latter may be in *excited* or in *normal* orbits **n compound** A compound that has neither acid nor basic reaction **n element** A member of the zero group of the periodic system, the rare gases He, Ne, A, Kr, Xe and Rd **n molecule** A system of two ions (cation and anion) in a solvent (See *solvate theory*) **n oil** Light petroleum, d 32–32°Be flash point, 290–320°F, which is sometimes mixed with animal or vegetable oils **n point** The point at which a solution has a neutral reaction, due to the union of the H^+ ions from an acid and the OH^- ions from a base to give practically undissociated water The hydrogen ion concentration therefore, corresponds with pH = 7.00, which is that of pure water Cf *isoelectric point* **n principle** The non-acid and non-basic constituents of plants, as, glucosides, esters oils **n reaction** A reaction that is neither acid nor basic **n red** Toluylene red, dimethyldiaminotoluphenazin hydrochloride, $Me_2NC_6H_3\langle^{N}_{N}\rangle C_6H_2MeNH_2\,HCl$ A dark green powder, soluble in water (red color) Used as a dye, and medicinally to test the function of the stomach It is an indicator, changing at pH 7.5 from blue (acid) to magneta (alkaline), and at pH 8 to orange-yellow **n salt** A salt that does not react acidic or basic It differs from the normal salt which may be either neutral, acid or basic **n salt effect** The reduction of the ionisation of a weak acid or weak base by the addition of an ionisable salt containing one of the ions already present Cf *buffer solutions* **n solution** A solution in which the number of hydrogen ions equals the number of hydroxyl ions A solution with pH 7.07, or a concentration of $10^{-7}H^+$ and OH^- **n violet** $C_{14}H_{15}N_4Cl$ A compound similar to n red, having H in place of a methyl group

neutrality The state of being neither acid nor basic in reaction

neutralization (1) The process of making a solution neutral, that is, adding a base to an acid solution or an acid to an alkaline or basic solution (2) The fundamental reaction of neutralization is

$$H^+ + OH^- \leftrightarrows HOH,$$
$$\text{Acid} + \text{Base} \leftrightarrows H_2O + \text{Salt}$$

while the reverse reaction is hydrolysis The end-point of neutralization is determined either by indicators or by measuring the electrical conductivity (volumetric analysis and electrometric titration respectively) **heat of-** The amount of heat liberated during the neutralization of a strong acid and a strong base in equivalent quantities of dilute solutions equals about 13.7 large calories or 57 kilojoules (3) Proton reaction The transfer of a proton, H^+, from an acid to a base producing a weaker acid A′, and a weaker base, B′, such as

$$A + B = A' + B'$$
$$HCl + H_2O \rightleftharpoons H_3O^+ + Cl^-$$
$$H_3O^+ + Ac^- \rightleftharpoons HAc + H_2O$$
$$H_3O^+ + OH^- \rightleftharpoons H_2O + H_2O$$
$$NH_4^+ + OH^- \rightleftharpoons NH_3 + H_2O$$

n ratio The ratio of the concentration of the anion of an acid to the total concentration of the undissociated acid

neutralize To make neutral

neutralizer Any agent produces a state of neutrality

neutrino Photon (1) A nuclear particle (q v) of zero mass and zero charge, probably a positron and electron Cf *neutron* (2) A hypothetical particle with no charge and small mass, 6×10^{-30} gm, emitted with an electron in radioactive and similar changes It shares the momentum and part of the energy of the particle Cf *neutron*

neutron n or ${}_0n^1$ (1) A proton and electron in immediate contact, a "building stone" of the atomic nucleus Each isotope contains in its atom (I—A) neutrons, where I is the isotopic weight and A the atomic number (2) An electrically-neutral particle with the mass of 1.006, which does not ionize air, produced from elements by bombardment with alpha-particles Cf *nuclear reactions*, *neutrino*, *neuton*, *particles*

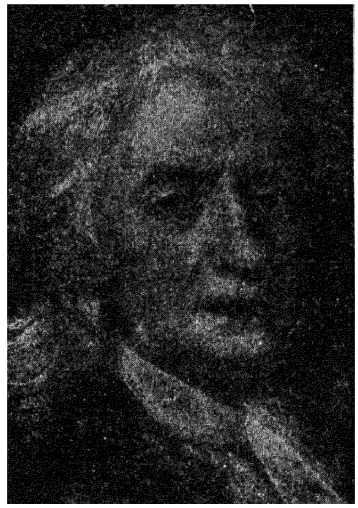
Neville acid 1.4-α-Naphthol-sulfonic acid

nevyanskite A native alloy of iridium and osmium with other platinum metals

new blue (1) Meldola blue (2) Prussian blue **n fuchsin** $C_{22}H_{23}N_3\,HCl = 367.8$ Soluble fuchsin A bluish-red dye obtained by oxidation of diamino-o-ditolyl-methane

Newlands, John Alexander Reina 1838–1898 An English chemist and pioneer in the development of the periodic system (q v) from his conception of "octaves"

Newton, Sir Isaac. 1642–1727. An English mathematician and philosopher, the originator of the Law of universal gravitation. **N.'s alloy.** An alloy of 20 parts bismuth, 30 parts tin, and 50 parts lead, m.202°F. **N.'s law.** The attractive force between two bodies is proportional to their masses. **N.'s rings.** Colored rings produced when plane and convex



Sir Isaac Newton.

glass surfaces are pressed together; they are the result of interference between the beams of light reaching the eye by reflection from the two surfaces on account of the difference in the lengths of the paths traversed.

N.F. Abbreviation for National Formulary, a supplement to the United States Pharmacopoeia. It contains the non-official remedies.

ngai camphor. Borneol.

Ni. Symbol for nickel.

niacin (amide). A non-technical synonym for nicotinic acid.

Niagara blue. Trypan blue.

niccolic. Nickelic.

niccolite. A pale-red native nickel arsenide, NiAs. Copper nickel, arsenical nickel.

niccolous. Nickelous.

niccolum. The Latin name for nickel.

Nichols, William Henry. 1852–1930. An American industrial chemist. **N. medal.** A prize founded in 1902 for an achievement in industrial chemistry.

Nicholson, William. 1753–1815. An English physicist and chemist, and a pioneer in electrolyzing water.

nicholsonite. A variety of aragonite, $CaCO_3$, containing various proportions of zinc.

nichrome. A high melting-point alloy of 60 % nickel, 25 % iron and 15 % chromium used in electric heating or resistance devices and acid-resisting apparatus. A trade name. **n. wire.** A wire of 80 % nickel and 20 % chromium alloy. Used in the laboratory as a platinum substitute (for bead and flame tests), for the construction of heating elements around glass tubings, and the construction of electrical resistances.

nickel. Ni = 58.69. An element of the iron group, atomic number 28. A silver-white metal, d.8.8–8.9, m.1452, b.3380, insoluble in water, dilute acids or alkalis. It occurs in niccolite and monel metal, in kupfernickel, nickel glance, and nickel blende. It was isolated in 1751 by Cronstedt. Nickel has valencies of 2 and 3.

2	3
Ni^{++}	Ni^{+++}
nickelous	nickelic
(niccolous)	(niccolic)

It is refined either by the Mond or the Oxford process, and is used for the galvanic coating of other metals (stainless steels), for acid-resisting alloys, for chemical apparatus, for coins and medals, for electric apparatus, surgical and dental instruments, as a catalyst in the hydrogenation of fats and oils (margarine manufacture), and in the manufacture of nickel salts. World output in 1940 was 130,000 tons, mostly produced in Canada. **Admiralty-** Adnic. **arsenical-** Niccolite. **emerald-** Zaratite. **Raney-** q.v. **super-** q.v.

n. acetate. Nickelous acetate. **n. alloys.** A series of non-corroding alloys, as argentan, china-silver, new-silver, nickelin, ferronickel. Some of these are harder than steel and are used for surgical instruments. The melting points of some common alloys are (in °C.):

with	90 %Ni 10 %	80 %Ni 20 %	70 %Ni 30 %	60 %Ni 40 %	50 %Ni 50 %
Cu	1440	1430*	1410‡	1380†	1335§
Sn	1380	1290	1200	1235	1290

* = nickeline, † = constantan, ‡ = corronel, monel, § = alpro, copel.

See also mumetal (74 %), permalloy (30–80 %), nichrome (60–80 %), monel (67 %), permivar (45 %) and German silver (30 % Ni). **n. ammonium nitrate.** $Ni(NO_3)_2(NH_3)_4(H_2O)_2$ = 286.9. Nickelo-amin-nitrate. $[Ni(NH_3)_4(H_2O)_2](NO_3)_2$. Green crystals, soluble in water, insoluble in alcohol, used in nickel plating. **n. ammonium chloride.** $Ni(NH_4)Cl_3 \cdot 6H_2O$ = 291.2. Nickelous ammonium chloride. A double salt which occurs in green, rhombic crystals, d.1.645, soluble in water or alcohol; used in nickel plating. **n. ammonium sulfate.** $Ni(NH_4)_2(SO_4)_2 \cdot 6H_2O$ = 395.0. Nickelous ammonium sulfate. A double salt, green crystals, d.1.929, soluble in water; used in nickel-plating and as a reagent. **n. arsenate.** Nickelous arsenate. **n. benzoate.** Nickelous benzoate. **n. black.** N. peroxide. **n. blende.** A native n. sulfide, NiS. **n. bloom.** Annabergite. **n. borate.** Nickelous borate. **n. bromide.** Nickelous bromidé. **n. carbide.** Ni_3C = 188.07. A black solid. **n. carbonate.** Nickelous carbonate. **n. carbonyl.** $Ni(CO)_4$ = 170.7. N. carbonoxide. A colorless liquid, d.1.318, m. −25, b.43, insoluble in water or alcohol. Used medicinally for hypodermic injections; and in the Mond process for the isolation of nickel (q.v.) since it gives this metal if heated: $Ni(CO)_4 \leftrightharpoons Ni + 4CO$. If pure it explodes at 60:—$Ni(CO)_4 = Ni + 2CO_2 + 2C$. **n. carbonoxide.** Nickel

carbonyl **n carbonyl** A poisonous gas **n chloride** Nickelous chloride **n chrome steel** An alloy of 95 pts Fe, 3 pts Ni, 1 5 pts Cr, and 0 5 pt C, used for heat- and acid-resisting machinery **n chromium triangle** A triangle made of nickel-chromium (nichrome) wire and used for heating small laboratory utensils (crucibles dishes) **n citrate** Nickelous citrate **n cyanide** Nickelous cyanide **n dimethyl glyoxime** $Ni(C_4H_7N_2O_2)_2$ = 288 7 A bright red crystalline precipitate, used to determine so little as 0 01 mg nickel, sublimes at 120 **n fluosilicate** $NiSiF_6 \cdot 6H_2O$ = 308 84 Green trigonal crystals, d 2 109, soluble in water **n glance** Ni_2As_2 A native arsenide and sulfide of nickel **n gymnite** Genthite A gymnite in which part of the magnesium is replaced by nickel **n iodide** Nickelous iodide **n minerals** Nickel occurs in nature associated with cobalt and iron as a constituent of meteorites, with chromium in olivine, and as sulfide, arsenide, and silicates

native nickel	Ni
awaruite	(Ni Fe)
bunsenite	NiO
millerite	NiS
pentlandite	(Ni, Fe)S
beyrichite	Ni_2S_3
polydymite	Ni_4S_5
niccolite	NiAs
chloanthite	$NiAs_2$
rammelsbergite	$NiAs_2$
gersdorffite	NiAsS
morenosite	$NiSO_4 \cdot 7H_2O$
zaratite	$NiCO_3 \cdot Ni(OH)_2$
garnierite	$2(Ni, Mg)_5Si_4O_{13} \cdot 3H_2O$
smaltite	$(NiCoFe)As_2$
white nickel ore	$NiAs_2$
nickel ochre	$Ni_3(AsO_4)_2 \cdot 8H_2O$

n monoxide Nickelous oxide **n nitrate** Nickelous nitrate **n ocher (ochre)** Annabergite **n oleate** $Ni(C_{18}H_{33}O_2)_2$ A waxy nickel soap or a compound of nickel with oleic acid, used medicinally in ointments **n oxalate** Nickelous oxalate **n oxides** NiO nickelous oxide, Ni_2O_3, nickelic oxide, Ni_3O_4 nickelous nickelic oxide, NiO_2, nickel peroxide, NiO_4, nickel superoxide **n phosphate** Nickelous phosphate **n plating** The deposition of pure nickel on copper, or steel coated with copper The deposit is soluble in acetic acid Saturated nickel ammonium sulfate is the usual medium **n pyrites** Millerite **n salipyrine** A salt of nickel and salicylic acid and antipyrine A pale greenish powder, used medicinally as an antiseptic **n sesquioxide** Nickelic oxide **n silver** An alloy of 10–30 % Ni, 50–70 % Cu and 10–30 % Zn Cf *German silver* **n. steel** A very tough alloy of 96 5 pts iron and 3 5 pts nickel **n stibine** Ullmannite **n sulfate** Nickelous sulfate **n sulfide** Nickelous sulfide **n superoxide** NiO_4 = 122 69 A black oxide produced by electrolysis **n tetracarbonyl** N carbonyl **n vitriol** Morenosite **n yellow** See *nickelous phosphate*

nickelic Niccolic Describing compounds of trivalent nickel They are all strong oxidizing agents, and readily reduced to the more stable nickelous compounds **n hydroxide** $Ni_2(OH)_6$ = 219 41 Niccolic hydroxide A black powder, rapidly decomp by heat Used as an oxidizing agent, and in the manufacture of nickelic compounds **n nickelous sulfide** Ni_2S_4 Native as polydymite **n oxide** Ni_2O_3 = 165 4 Nickel sesquioxide, niccolic oxide, nickel tetroxide black nickel oxide A black powder, d 4 83, reduced to NiO at 600°C , insoluble in water, soluble in acids and ammonium hydroxide, used in storage batteries as an oxidizing agent **n sulfide** Ni_2S_3 Native as beyrichite (q v)

nickeline (1) An alloy of 80 pts copper and 20 pts nickel (2) An alloy consisting of 56 pts copper 31 pts nickel, and 13 pts zinc, used in high resistance apparatus

nickelous Describing compounds containing divalent Ni^{++} The anhydrous salts are yellow, the hydrous salts green **n acetate** $Ni(C_2H_3O_2)_2 \cdot 4H_2O$ = 248 8 Green crystals, d 1 798, soluble in water **n arsenate** $Ni_3(AsO_4)_2 \cdot 8H_2O$ = 598 2 A yellowish-green powder insoluble in water, soluble in acids **n benzoate** $Ni(C_7H_5O_2)_2 \cdot H_2O$ = 318 7 A light green powder, soluble in ammonium salt solutions **n borate** $Ni(BO_2)_2 \cdot 2H_2O$ = 180 7 A bright green powder, insoluble in water **n bromide** $NiBr_2$ = 218 52 Anhydrous nickel bromide Yellow scales, d 4 64, decomp by heat, soluble in water, alcohol, or ether *hydrous-* $NiBr_2 \cdot 3H_2O$ = 272 57 Nickel bromide trihydrate Green, deliquescent needles, soluble in water, alcohol, or ether, used in medicine as an antiseptic and nerve tonic *ammonia-* $NiBr_2 \cdot 6NH_3$ = 320 73 Nickel ammonia bromide, nickelo-ammonia bromide Purple crystals, d 1 837, soluble in water **n carbonate** $NiCO_3$ = 118 7 A light green, rhombic, crystalline powder insoluble in water soluble in acids used in electroplating *basic-* $2NiCO_3 \cdot 3Ni(OH)_2 \cdot 4H_2O$ = 587 5 A light green, amorphous powder, insoluble in water, but soluble in acids or ammonia, used in nickel plating **n chloride** $NiCl_2$ = 129 6 Anhydrous nickel chloride Yellow scales, d 2 56 soluble in water or ammonium hydroxide It sublimes and is used as a reagent for detecting sulfocarbonates, as an absorbent in gas masks, for nickel plating, and for preparing sympathetic ink *hydrous-* $NiCl_2 \cdot 6H_2O$ = 237 7 Nickelo-aqua-chloride Hexagonal green crystals, soluble in water or alcohol, similarly to the anhydrous salt *ammonia-* $NiCl_2 \cdot 6NH_3$ = 231 8 Nickelo-ammonia-chloride (different from nickelous ammonium chloride) Purple crystals, soluble in water **n citrate** $Ni_3(C_6H_5O_7)_2 \cdot 8H_2O$ = 698 2 Nickel citrate A green, hygroscopic, crystalline powder, soluble in water used in nickel plating **n cyanide** $Ni(CN)_2 \cdot 4H_2O$ = 182 8 Nickel cyanide An apple-green powder insoluble in water, soluble in cyanide solutions, used in electroplating and metallurgy **n formate** $(HCOO)_2Ni \cdot 2H_2O$ = 184 74 Green crystals, d 2 154, soluble in water **n hydroxide** $Ni(OH)_2$ = 92 7 A white amorphous powder d 4 36, insoluble in water, soluble in ammonia *hydrous-* $4Ni(OH)_2 \cdot H_2O$ = 388 8 A light green powder, d 4 36, insoluble in water soluble in ammonia solutions or acids, used in the manufacture of nickelous salts **n iodide** NiI_2 = 312 5 Nickel iodide Black scales, d 2 05, m 57 b 137, soluble in water or alcohol **n nickelic oxide** Ni_3O_4 = 240 0 Nickel tetroxide A gray powder, insoluble in water, soluble in acids **n nitrate** $Ni(NO_3)_2$

= 182 7 Anhydrous nickel nitrate A yellow powder, soluble in water (green color) *hydrous-* $Ni(NO_3)_2 6H_2O$ = 290 8 Nickelo-aqua-nitrate A monoclinic, crystalline, deliquescent mass, d 2 05, m 57, b 136 7, soluble in water alcohol, or ether, used as a reagent and in nickel plating *ammonia-* $Ni(NO_3)_2 \cdot 6NH_3$ = 284 7 Nickelo-ammonia-nitrate Dark blue crystals, soluble in water, used combined with tannic acid, in staining hair and fur **n oxalate** NiC_2O_4 = 146 7 Nickel oxalate A pale green powder, insoluble in water, soluble in acids **n oxide** NiO = 74 7 Nickel monoxide nickel protoxide, green nickel oxide A green powder, d 6 96, insoluble in water, soluble in acids or ammonium hydroxide, used in the manufacture of nickel salts, and in green pigments for ceramics **n phosphate** $Ni_3(PO_4) 7H_2O$ = 492 2 Normal nickel (ortho) phosphate A green powder, insoluble in water, soluble in acids Used in the nickel plating of iron copper, and brass, and in the manufacture of a yellow pigment (nickel yellow) **n sulfate** $NiSO_4$ = 154 8 Anhydrous nickel sulfate Regular yellow crystals, d 3 418, decomp 830, soluble in water or alcohol *hydrous-* (1) $NiSO_4 7H_2O$ = 280 86 Nickelous sulfate heptahydrate, nickelo-aqua-sulfate Green rhombic crystals, d 1 98, dehydrated at 100°C soluble in water, or alcohol Used in nickel plating for blackening brass and zinc, as a mordant in the textile industry and in medicine as a tonic and sedative, also as a reagent for glucose and albumose (2) $NiSO_4,6H_2O$ = 262 84 Blue or green crystals, soluble in ammonia **n sulfide** NiS = 90 8 Nickel sulfide A black, hexagonal, crystalline powder, d 4 60, m 797, slightly soluble in water, soluble in acids, used in ceramics **n tartrate** $NiC_4H_4O_6 5H_2O$ = 296 9 A light green powder, insoluble in water **n thallous sulfate** $NiSO_4 Tl_2SO_4 \cdot 6H_2O$ = 767 6 Nickel thallium sulfate A double salt, forming green crystals soluble in water

Nicol, William 1768–1851 An English physicist noted for his inventions of optical devices **N 's prism** See *nicols*

nicoline C_3H_4O = 56 0 A constituent of *Lonchocarpus rufescens* a Leguminosae of Guiana The plant is used by the natives to stupify fishes

nicols Nicol's prism A set of two prisms of Iceland spar cemented together, used as polarizer and analyzer in polariscopes Cf *polaroids, polarizing disks*

nicopyrite A variety of pyrite containing nickel

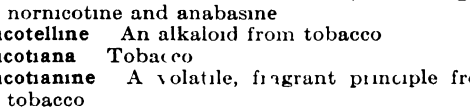
nicotene $C_{10}H_{12}N_2$ = 160 11 An alkaloidal mixture from Kentucky tobacco, consisting of nornicotine and anabasine

nicotelline An alkaloid from tobacco

nicotiana Tobacco

nicotianine A volatile, fragrant principle from tobacco

nicotine $C_{10}H_{14}N_2$ = 162 2 Pyridyl- β-N-



methylpyrrolidine A di-acid alkaloid from the leaves of *Nicotiana tabacum* Colorless or yellowish liquid, d 1 01, b 247, soluble in water, alcohol or ether Used as an antiparasitic and insecticide in horticulture and agriculture, in sheep dips, and medicinally, as an antitetanic agent **dihydroxy-** Pilocarpidine **neo-** Anabasine **nor-** Nornicotine **n group** A group of alkaloids derived from pyridine and pyrrolidine 1 Nicotine and pilocarpine and derivatives 2 Sparteine, oxalethyline, and lobeline 3 Coniine 4 Pyridine bases **n hydrochloride** $C_{10}H_{14}N_2 2HCl$ = 235 1 Colorless hygroscopic crystals, soluble in water **n salicylate** $C_{10}H_{14}N_2 C_7H_6O_3$ = 300 3 Colorless plates m 117, soluble in water, or alcohol, used medicinally in ointments for skin diseases **n tartrate** $C_{10}H_{14}N_2 (C_4H_4O_6)_2 2H_2O$ = 494 4 Colorless or reddish crystals, soluble in water or alcohol, used medicinally as an anti-tetanic agent and in strychnine poisoning

nicotinic acid Niacin C_5H_4NCOOH = 123 1 Pyridine-β-carboxylic acid, 2-pyridine-carboxylic acid* Colorless needles, m 228, slightly soluble in water, soluble in alcohol or ether Cf *vitamin* B_5 **iso-** 3-pyridine-carboxylic acid Colorless crystals, m 304, slightly soluble in water **tetrahydro-*1*-methyl-** Arecaidine

nicouic acid $C_{12}H_{12}O_8$ = 284 09 *2 4*-$(COOH)_2$-*3*-(OH) $C_6H_2OCMe_2COOH$ A tribasic acid obtained from rotenone and deguelin

nicoulin A resin from nekoe or stink wood, *Gustavia ocotea,* used by the Malayans as an arrow poison

nicouline Rotenone

niello silver Russian tula, blue silver A bluish alloy of silver, copper, lead and bismuth

Nierenstein, Max 1877– An English chemist, noted for organic synthesis **N reaction** The synthesis of ketones by means of diazomethane $RCOCl + CH_2N_2 \rightarrow RCOCH_2Cl + N_2$ Cf *Schlotterbeck reaction*

Nieuwland, Father Julius Arthur 1878–1936 A Jesuit American chemist, noted for the synthesis of acetaldehyde, vinylacetylene and synthetic rubber from acetylene

nigella Black caraway, black cumin, small fennel The dried seeds of *Nigella sativa,* used as a condiment, in snuff, and medicinally

nigelline An alkaloid in the seeds of *Nigella sativa* a Ranunculaceae

night-blooming cereus Cactus grandiflorus

nightshade The name of several plants of the Solanaceae **deadly-** Belladonna **garden-** *Solanum nigrum* **woody-** Bittersweet

nigraniline Nigrosine

nigre A dark colored layer, formed in the soap pan, between the neat soap and the lye, as an isotropic solution containing a higher concentration of soap than the lye, a fairly high concentration of salts and colored impurities

nigrite A variety of asphalt

nigrium Ng An alleged new element discovered by Church in 1869, and probably impure hafnium

nigrometer An instrument to evalue the color of carbon blacks

nigrosine $C_{38}H_{27}N_5$ = 525 3 Aniline black Pure nigrosine obtained by oxidation of aniline, used as a microscopic stain

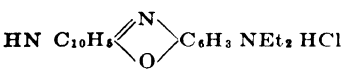
nigrosines A group of black or deep blue aniline dyes obtained by oxidation of aniline and its homologues Used in the manufacture of inks and shoe polishes, and in dyeing leather, textiles, wood, and furs

nigrotic acid *3 6*-Dihydroxy-*2 7*-sulfonaphthoic acid

nihil album Zinc oxide

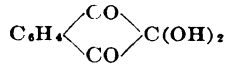
Nikiforoff stain (1) A borax-carmine solution acidified with acetic acid and used to stain nuclei (2) An alkaline concentrated methylene blue solution, used as counter-stain

nile-blue $C_{20}H_{19}ON_3$ = 317 2 A bright, green-blue aniline dye, insoluble in water soluble in alcohol or ether,



Used as a pH indicator, changing from yellow (acid) through blue to magenta (alkaline) **n blue sulfate** An oxidation-reduction and pH indicator, used also as vital stain

ninhydrin $C_9H_6O_4$ = 178 09 A trade name Triketohydrindene hydrate, nindrine,



Colorless crystals, used as a reagent in the Abderhalden test for proteins and amino acids (blue color) in diagnosing pregnancy

nindrine Ninhydrin

niobate Columbate, CbO_3^{--}

niobe oil Methyl benzoate

niobic A salt of pentavalent columbium (Nb^{+++++} or Cb^{+++++}) See *columbic* **n acid** $HNbO_3$ Columbic acid $HCbO_3$ **n anhydride** Nb_2O_5 Columbic anhydride, Cb_2O_5

niobite $(Fe,Mn)O\ (Nb,Ta)_2O_3$ A native iron, manganese niobate and tantalate, which occurs in black crystals

niobium Nb A metallic element, discovered in 1844 by H Rose and named after Niobe, the daughter of Tantalus, as it resembles tantalum It is commonly named columbium, Cb, (q v)

niobous Columbous

nioboxy Columboxy

nioform Vioform

nipagin $C_8H_8O_3$ = 152 06 Solbrol Methyl-*p*-hydroxybenzoate, $HO\ C_6H_4COOMe$ An isomer of methylsalicylate, used as a preservative

nipasol $C_{10}H_{12}O_3$ = 180 18 Propyl-*p*-hydroxybenzoate White powder, used as preservative

nipecotic acid $C_5H_{10}N\ COOH$ = 129 09 3-piperidinecarboxylic acid An isomer of hygric and nicotinic acids, q v

nipponium The element No 43 reported by Ogawa It has not been verified See also *masurium*

ni-resist A heat-resistant, non-magnetic weldable alloy of iron with 12–15 % Ni, 5–7 % Cu and 1 5–4 % Cr, used in glass-annealing furnaces and in manifold valves of automobile engines

nirvanine $C_{14}H_{20}O_4N_2$ = 280 2 Diethylglycine-methyl-*2*-hydroxy-*5*-amino benzoate

$$Et_2N\ CH_2CONH\ C_6H_3(OH)COOMe$$

A cocaine alkaloid Colorless prisms, m 185, soluble in water, used medicinally as a local anesthetic

nirvanol $C_{11}H_{12}O_2N_2$ = 204 11 *5 5*-phenyl-ethyl hydantoin A white powder, used as a hypnotic Cf *luminal*

nisinic acid $C_{24}H_{36}O_2$ = 356 29 A highly-unsaturated acid from fish liver oils

niter, nitre Potassium nitrate **Chile- or cubic-** Sodium nitrate **Norwegian-** Calcium nitrate **rough-** Magnesium chloride **spirit of-** Spirit of *ethyl nitrite*

n air See *oxygen* **n cake** Crude sodium sulfate containing some bisulfate and nitrate, obtained as a by-product in the manufacture of nitric acid by the retort process

niton Nt (1) The element of atomic number 86, which consists of the isotopes radon, actinon, and thoron It was discovered in 1898 by Mme Curie (*2*) Radon

nitracetanilide $C_8H_6O_3N_2$ = 180 12 Nitroacetanilide Colorless crystals, *o-* m 92, *m-* m 151, *p-* m 210

nitragin A nitrifying bacterial ferment obtained from the root tubercles of leguminous plants

nitralloy Chromium-aluminum steels containing 0 2–0 6 % carbon They are surface-hardened by nitridation

nitramide NH_2NO_2 = 62 1 Colorless crystals m 75 **phenyl-** $C_6H_5NH\ NO_2$ = 138 1 Colorless crystals, m 46, b 98, soluble in water

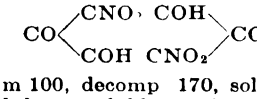
nitramides A group of compounds derived from nitramide and differing from nitramines by the presence of a —COO— radical

$NO_2\ NH_2$ = nitramide
$NO_2\ NH\ COOH$ = nitrocarbamic acid
$NO_2\ NH\ COOEt$ = nitrourethane
$NO_2NH\ CH_2\ COOH$ = nitramineacetic acid

nitramine (1) An organic compound containing the monovalent —NH NO_2 or the bivalent =N NO_2 radical (2) Picrylmethylnitramine used as a pH indicator, changing at pH 10 5 from colorless (weakly) alkaline to brown (strongly alkaline) **diethyl-** $Et_2N\ NO_2$ = 118 1 A colorless liquid, b 206 **dimethyl-** $Me_2N\text{-}NO_2$ = 90 1 Colorless crystals, m 58, b 187, soluble in water **ethyl-** $EtNH\ NO_2$ = 90 1 A colorless liquid, m 3 **iso-** An organic compound containing the monovalent —N—N—OH (with O) radical **phenyl-** $NHPh\ NO_2$ = 138 1 Colorless crystals, m 46 b 98, soluble in water **phenylmethyl-** $MeNPh\ NO_2$ = 152 2 Colorless crystals, m 39 soluble in water **propyl-** $PrNH\ NO_2$ A colorless liquid, b 140

nitramino The monovalent radical, NO_2NH— **n acetic acid** $C_2H_4O_4N_2$ = 120 2 A homolog of nitrourethane $NO_2\ NH\ CH_2\ COOH$ Colorless crystals, m 103, soluble in water, or alcohol with a strong acid reaction

nitranilic acid $C_6H_2O_8N_2$ = 230 07 Dinitrodihydroxy benzoquinone



A solid, m 100, decomp 170, soluble in water or alcohol, but insoluble in ether

nitranilide $C_6H_5N\ NO\ OH$ = 138 1 Diazobenzene acid Phenyl-isonitramine An isomer of phenylnitramine Colorless crystals, m 46, soluble in water, alcohol or ether

nitraniline $NH_2\ C_6H_4\ NO_2$ = 138 1 **ortho-** 1 2-nitraniline, 1-amino-2-nitrobenzene Colorless needles, d 1 443, m 71, slightly soluble in water, soluble in alcohol or ether **meta-** 1 3-nitraniline Yellowish needles, d 1 430, m 114, b 285, slightly soluble in water, soluble in alcohol or ether **para-** 1 4-nitraniline Yellow needles, $d_{14°}$ 1 437, m 146, slightly soluble in water, soluble in alcohol or ether Used in organic synthesis and as indicators for strong acids **di-** See *dinitroaniline*

nitranilines. A group of compounds derived from benzene by the substitution of two or more hydrogen atoms by one or more NH_2— and NO_2— radicals:

Mononitranilines: 1.2- = ortho-, 1.3- meta-, and 1.4- = para-.

Dinitranilines: 1.2.3- and 1.2.4-.

Trinitranilines: 1.2.4.6- = Picramide.

Tetranitraniline: 1.2.4.5.6- = Tetryl.

The higher nitrated anilines are extremely powerful explosives.

nitrate. (1) A salt of nitric acid, or any compound containing the monovalent —NO_3 radical. (2) Nitration. **n. ion.** The NO_3^- ion, colorless, and forming no insoluble precipitates with metallic ions. **n. of lime.** Calcium nitrate. **n. of potash.** Potassium nitrate. **n. of soda.** Sodium nitrate. **n. of soda-potash.** A crude Chilean saltpeter containing 75 % $NaNO_3$ and 25 % KNO_3, used as fertilizer.

nitrated. Describing an organic compound containing the —NO_2 group.

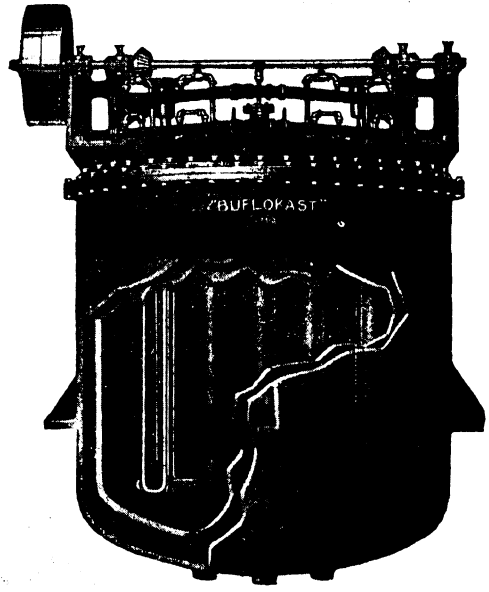
nitratine. A mineral form of sodium nitrate.

nitrating. Performing a nitration, q.v.

nitration. The introduction of the NO_2 group into an organic compound, usually by means of nitric acid, fuming nitric acid, or a mixture of sulfuric and nitric acids.

nitrato- A prefix indicating an organic compound containing the —$O.NO_2$ radical. Cf. *nitrito-*.

nitrator. A vessel, usually double-jacketed, with or without heating or cooling coils and stirring device, used for nitration.



Nitrator.

nitrazine yellow. A dye used as a pH-indicator. At pH 6.5 it changes from yellow (acid) to blue-green (alkaline). **n. paper.** A filter-paper impregnated with sodium dinitrophenyl-azo-naphthol disulfonate; used to determine pH-values of solutions as follows: yellow, pH 4.5; olive green, pH 6.2; blue, pH 7.0.

nitre. Niter. **n. air.** See *oxygen.*

nitrenes. A group of compounds of the type, $R_2C{:}NR{:}CR_2$.

nitric acid. HNO_3 = 63.02. A colorless liquid, $d._0$1.53, m. −40.3, b.86, soluble in water in all proportions; used extensively in its aqueous solutions:

(a) Fuming, d.1.48, containing 86 % HNO_3.

(b) Concentrated, d.1.40–1.42, containing 65 % HNO_3.

(c) d.1.20, containing 32–34 % HNO_3.

(d) Dilute, d.1.06, containing 10 % HNO_3.

concentrated- 65 % HNO_3. Aqua fortis, azotic acid. A clear, colorless or faintly yellow liquid, d.1.40. Used as a solvent for metals, as an oxidizing agent, in nitrating organic compounds, as a reagent, in etching, and in innumerable chemical operations. **chloro-** See *chloro-*. **diluted-** 10 % HNO_3. A clear, colorless liquid, used as a reagent, as a solvent, as an acidifying agent, and in numerous chemical operations. **fuming-** 86 % HNO_3 with some N_2O_4. Yellow or brownish-red fuming liquid, d.1.48–1.5. Used as an energetic oxidizing agent in chemical analysis and synthesis. **per-** HNO_4. An acid of doubtful existence. **n. anhydride.** Nitrogen pentoxide. **n. hydrate.** HNO_3 + 32 % H_2O. $d._{15.5°}$1.414, b.120.5.

nitric ether. Ethyl nitrate.

nitric oxide. NO = 30.0; N_2O_2 = 60.0. Nitrogen dioxide. A colorless gas, $d._{(air=1)}$1.0366, m. −160, b. −153. Slightly soluble in water. Formed in the electric arc from air, and oxidizes readily to nitrogen peroxide.

nitridation. (1) The formation of metallic nitrides by heating metals in an atmosphere of nitrogen. The hardness of the metal is increased. Cf. *nitration.* (2) A type of de-electronation in the ammonia system, analogous to oxidation in the water system. Cf. *nitridizing agent.*

nitride. A binary compound of nitrogen and a metal. The alkali and earth-alkali nitrides are readily hydrolyzed by water to ammonia: $Mg_3N_2 + 6H_2O = 3Mg(OH)_2 + 2NH_3$.

nitridizing agent. A substance which furnishes nitrogen or causes an exchange of electrons in liquid ammonia; as, hydrazoic acid (ammono-nitric acid) HN_3, iodoamine (ammono-hypoiodous acid) H_2NI, mercuric nitride Hg_3N_2, which are analogous to HNO_3, HOI and HgO as oxidizing agents.

nitrifiable. Any nitrogen compound that can be transformed into nitrates by soil bacteria.

nitrification. The oxidation of the nitrogen in ammonia to nitrous and nitric acid or salts.

nitrifiers. The soil bacteria which oxidize ammonia and its derivatives to nitrites, as nitromonas and nitrococcus; or to nitrates, as nitrobacter.

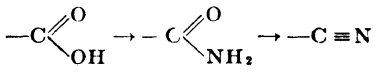
nitrifying. To cause the oxidation of ammonia or atmospheric nitrogen to nitrites and nitrates, *e.g.*, by n. bacteria and n. catalysts.

nitrilase. A catalase which converts aldehydes to hydroxynitriles or cyanohydrins, R.CHOH.-CN.

nitrile. A cyanide prepared from an acid amide, $R.CONH_2 - H_2O = R.CN$; hence acetonitrile or methylcyanide, propionitrile or ethylcyanide, which on hydrolysis yield the corresponding acid with evolution of ammonia. **n. group.** The negative, trivalent ≡N which remains from ammonia after substitution of its three hydrogen atoms.

nitriles. Cyanides. An organic compound containing the monovalent —CN radical. **acid-**

Nitrile This name indicates their relationship with the —COOH group



On hydrolysis they yield acid amides and acids **basic-** A tertiary amine NR_3 It differs from the nitriles by having three different carbon atoms attached to the same nitrogen **di-** Dicyanide A compound containing two —CN radicals **mono-** A compound containing one —CN radical

nitrilo- A prefix indicating the presence of a triple bond nitrogen atom, ≡N

nitrine N_3 = 42 02 A hypothetical allotropic form of nitrogen analogous to ozone, O_3 See *active nitrogen*

nitrite A salt of nitrous acid, or a compound containing the monovalent —NO_2 radical The inorganic nitrites of the type, MNO_2, are all insoluble, except the alkali-nitrites The organic nitrites or nitrito-compounds may be isomeric, but not identical with the corresponding nitro-compounds

nitrito- Describing an organic compound containing the monovalent —O N O (or oxynitroso) radical

nitro- (1) A prefix which denotes the presence of the monovalent —NO_2 or —N<O>O radical

Nitro-compounds are usually yellowish in color, and differ from the less stable, isomeric nitrito-compounds Cf *nitroxyl, nitrite, nitrito* (2) A misnomer for nitrate, as, nitroglycerin (glyceryl nitrate) **aci-** Isonitro- **iso-** See *isonitro-*

nitroacid A compound containing both the —COOH and —NO_2 radicals, as
$NO_2 CH_2 COOH$ = nitroacetic acid,
$NO_2 CH_2 CH_2 COOH$ = nitropropionic acid

nitroalizarin $C_{14}H_5O_2(OH)_2NO_2$ = 285 1 **alpha-** or 4 1 2 Yellow crystals, decomp 290 **beta-** 3 1 2 Alizarin orange Orange-yellow crystals, decomp 244, slightly soluble in water, soluble in alcohol, used as dye, and as an intermediate in organic synthesis

nitroamine Nitramine

nitroanisole $C_6H_4(OMe)NO_2$ = 153 1 **ortho-** 1-methoxy-2-nitrobenzene A yellow liquid, d 1 268, m 9, b 265 **meta-** m 38, b 258 **para-** Colorless or yellowish plates, d 1 233, m 54, b 258 Both are insoluble in water, soluble in alcohol or ether

nitroanthracene $C_{14}H_9NO_2$ = 223 2 Nitrosoanthrone Yellow needles, m 146, insoluble in water, soluble in benzene or chloroform

nitroanthraquinone $C_6H_4(CO)_2C_6H_3NO_2$ = 253 1 **alpha-** or 1- Yellow needles, m 228 subliming when heated, insoluble in water, soluble in alcohol or ether **beta-** or 2- Yellow needles, m 184, subliming when heated, insoluble in water, soluble in alcohol or ether **n sulfonic acid** A reagent for sugars

nitrobacter A soil bacterium or other microorganism that oxidizes ammonia and its derivatives, or atmospheric nitrogen, to nitrites or nitrates

nitrobacteria Soil bacteria, as nitrobacter, nitrosococcus or nitrosomonas

nitrobarite A native barium nitrate, $Ba(NO_3)_2$

nitrobenzaldehyde $C_6H_4(NO_2)CHO$ = 151 1 **ortho-** Yellow needles, m 44, b $_{23mm}$153 slightly soluble in water, soluble in alcohol or ether **meta-** Colorless needles, m 58, b $_{23mm}$164, soluble in alcohol or ether **para-** Colorless prisms, m 106, slightly soluble in water, soluble in alcohol or ether, used in organic synthesis The ortho-compound is used in the synthesis of indigo

nitrobenzamide $NO_2 C_6H_4 CONH_2$ = 166 1 **ortho-** Colorless needles, m 174, b 317, soluble in water, alcohol, or ether **meta-** Yellow needles, m 140, b 310, soluble in alcohol or ether **para-** Colorless needles, m 198, slightly soluble in water, soluble in alcohol or ether, used in organic synthesis

nitrobenzanilide $NO_2 C_6H_4 CONHPh$ = 242 2 **meta-** 3-nitro-1-benzamido benzene Colorless leaflets, m 143, insoluble in water, soluble in alcohol or ether

nitrobenzene $C_6H_5NO_2$ = 123 08 Nitrobenzol, oil of mirbane, phenylnitrite, essence of mirbane, artificial oil of bitter almonds $PhNO_2$ A yellow liquid, d $_{20°}$1 198, m 5, b 210, slightly soluble in water, soluble in alcohol or ether Used as a reagent for sulfur, calcium oxide, and glucose, in perfumery, as a substitute of almond oil, technically in large quantities, as a raw material for aniline and aniline derivatives, benzidine, quinoline, and other organic compounds **amino-** Nitraniline **chloro-** $C_6H_4ClNO_2$ = 157 50 Colorless crystals **o-** d 1 365, m 32 5, b 245 7 **m-** d 1 534, m 44, b 235 **p-** d 1 520, m 83 5, b 242 **dimethyl-** Nitroxylene **methyl-** Nitrotoluene **tetra-** q v **tri-** q v

n azoresorcinol Magneson A reagent for magnesium (blue color) **n reduction** The chemical reactions involved in the reduction of nitro-benzene to amino-benzene (aniline) in alkaline solutions The following compounds are produced

$PhNO_2 + NO_2Ph$ = 2 mol nitrobenzene
Ph N<O>N Ph = 1 mol azoxybenzene
Ph N=N Ph = 1 mol azobenzene
Ph NH—NH Ph = 1 mol hydrazobenzene
↓ $PhNH_2 + NH_2Ph$ = 2 mol aniline

n sulfonylchloride A reagent for amines

nitrobenzoic acid $NO_2 C_6H_4 COOH$ = 167 1 **ortho-** Yellow crystals, d 1 57, m 148 soluble in water, alcohol or ether, used in organic synthesis and as a reagent **meta-** Yellowish white leaflets, d 1 49, m 141 4, soluble in water, alcohol, or ether **para-** Nitrodracylic acid Yellowish crystals, d 155, m 242 4, slightly soluble in water, soluble in alcohol or ether, used in organic synthesis

nitrobenzol Nitrobenzene

nitrobenzonitrile $NO_2 C_6H_4 CN$ = 148 1 **ortho-** 2-nitro-1-cyano-benzene Colorless, silky needles, m 109, soluble in hot water, alcohol, or ether **meta-** Colorless needles, m 115, slightly soluble in water, soluble in alcohol, or ether **para-** Colorless leaflets, m 149, insoluble in water, slightly soluble in alcohol, soluble in chloroform or ether, used in organic synthesis

nitrobenzophenone $NO_2 C_6H_4 CO C_6H_5$ = 227 1 **ortho-** Colorless needles, m 105, soluble in alcohol **meta-** Colorless leaflets, m 95, soluble in alcohol **para-** Colorless needles, m 138, soluble in alcohol

nitrobenzoquinone $C_6H_3O_2NO_2$ = 153 1 Yellow crystals, decomp 206, slightly soluble in water

nitrobenzoyl The monovalent radical NO_2-C_6H_4CO—, derived from nitrobenzoic acid **n chloride** $C_7H_4O_3NCl$ = 185 5 **ortho-** A solid, m 75, b $_{105mm}$205 **meta-** m 34, b 278 **para-** m 72. **n formate** $C_6H_4NO_2$-CO COOH = 195 09 **ortho-** A solid, soluble in warm water, m about 123

nitrobenzyl The monovalent radical, NO_2-$C_6H_4CH_2$—, derived from nitrotoluene by replacing a hydrogen of the methyl group Three isomeric radicals ortho-, meta-, and para-nitrobenzyl **n alcohol** $NO_2C_6H_4CH_2$-OH = 153 1 **ortho-** Colorless needles, m 74, slightly soluble in water, soluble in alcohol or ether **meta-** Rhombic crystals, m 27, **para-** Colorless needles m 93, b 180, soluble in alcohol or ether **n bromide** $C_6H_4NO_3CH_2Br$ = 215 95 A reagent for hydroxy compounds **n chloride** $C_6H_4NO_2CH_2Cl$ = 171 55 **ortho-** A solid, m 48 **meta-** A solid, m 46 **para-** A solid, m 71 **n cyanide** $NO_2C_6H_4$-CH_2CN = 162 1 **ortho-** Colorless needles, m 83, soluble in hot water **meta-** Colorless prisms, m 115, insoluble in water, soluble in alcohol or ether **para-** Colorless crystals, m 110, soluble in alcohol

nitrobromoform NO_2CBr_3 = 297 78 Bromopicrin A colorless liquid, d 2 81, m 10, b $_{48mm}$ 128 insoluble in water, soluble in alcohol or ether

nitrocarbamate Any salt or ester of nitrocarbamic acid or a compound containing the NO_2NH COO— radical **ethyl-** Urethane **potassium-** $NO_2NHCOOK$

nitrocarbamic acid $CH_2N_2O_2$ = 74 0 NO_2-NH COOH

nitrocarbol Nitromethane

nitrocellulose $C_6H_7O_5(NO_2)_3$ = 297 2 Any ester of nitric acid and cellulose, thus, pyroxylin (11 2–12 4 % N) and guncotton (12 4–13 % N) Cf *rayon, viscose* A granular, amorphous yellow mass used in the manufacture of celluloid and collodion, mixed with picrates and other explosives, as an explosive, also extensively used as constituent of lacquers, q v The name is also applied to other nitrates of cellulose (cf *cellulose nitrate*)

nitro-chalk A fertilizer containing 10 % of available nitrogen It consists of ammonium nitrate and calcium carbonate (cf *calnitro*)

nitrochlorobenzene $NO_2C_6H_4Cl$ = 157 6 **ortho-** Colorless crystals, soluble in alcohol or ether, used in organic synthesis

nitrochlorobenzol Nitrochlorobenzene

nitrochloroform Chloropicrin

nitrocinnamic acid $NO_2C_6H_4CH$ CHCOOH = 193 1 **ortho-** Colorless scales, m 240, insoluble in water, soluble in alcohol or ether **meta-** Yellow needles, m 196, slightly soluble in water **para-** Colorless prisms, m 285, insoluble in water, soluble in alcohol or ether, used in organic synthesis

nitrococcus Nitrosococcus

nitrocolors A series of colored compounds and dyes containing the nitro-group, as picric acid, naphthol yellow, naphthol green

nitrocompound An organic compound containing the monovalent —NO_2 group

nitrocotton Guncotton

nitrocresol $CH_3C_6H_3NO_2OH$ = 153 10 A yellow solid, m 54, soluble in ether or alcohol, insoluble in water

nitrocumene $C_9H_{11}O_2N$ = 165 14 C_6H_4NO-CHMe A colorless liquid, m −35, b 224 (decomp)

nitrocymene Nitroisopropylmethyl benzene

nitrodiethylaniline $NO_2C_6H_4NEt_2$ = 194 2 **ortho-** A soluble oily liquid, b 290 **para-** Colorless needles, m 77, soluble in hot alcohol or ether

nitrodimethylamine NO_2NMe_2 = 114 1 Colorless crystals, m 57, b 187 soluble in water, alcohol or ether

nitrodimethylaniline $NO_2C_6H_4NMe_2$ = 166 14 **ortho-** A liquid, b $_{30mm}$151 **meta-** Red prisms, d 1 31 m 60 decomp 280, insoluble in water, soluble in alcohol or ether **para-** Yellowish needles, m 164, insoluble in water, soluble in alcohol or ether

nitrodiphenyl $NO_2C_6H_4Ph$ = 199 14 **ortho-** Colorless leaflets, m 37, b 320 insoluble in water, soluble in alcohol or ether **meta-** Yellow solid, m 61 **para-** Colorless needles, m 114, b 340, insoluble in water, slightly soluble in alcohol or ether

nitrodracylic acid p-Nitrobenzoic acid

nitrodye A dyestuff containing one or more nitro-groups (nitrocolor)

nitroerythrite Nitroerythrol

nitroerythrol $C_4H_6(NO_3)_4$ = 302 11 Butine tetranitrate, erythrol tetranitrate, tetranitroerythritol Large glistening plates, m 61, exploding on percussion or heating, soluble in ether, slightly soluble in water, used in explosives

nitroethane $C_2H_5NO_2$ = 75 047 A colorless liquid, d 1 056, m −50, b 114, slightly miscible with water, soluble in alcohol or ether, cf *ethyl nitrite*

nitroform $CH(NO_2)_3$ = 151 1 Trinitromethane Colorless crystals, m 15, which explode when heated, soluble in water

nitrogelatin Dynamite

nitrogen N = 14 008 A gaseous element (N_2) in the atmosphere atomic number 7 Colorless gas, $d_{air=1}$ 0 967, m −210, b −195, slightly soluble in water or alcohol Nitrogen was first produced by Rutherford in 1772 from air and named "mephitic air," Priestley, in 1780, called it "phlogisticated air," and Cavendish, in 1785, produced nitric acid from air and called it nitrogen (niter-producing gas) Nitrogen (as element) occurs in many minerals, *e g*, chili nitre $NaNO_3$, saltpeter KNO_3 The principal valencies of nitrogen are 3 and 5, but it forms numerous oxides and several series of compounds On account of its readiness to change its valency, all nitrogen-containing compounds are fairly unstable, such as explosives and proteins It is the cheapest chemical substance, and is used in the manufacture of nitric acid, nitrates, cyanamides, ammonia, nitrides, and cyanides by the various processes of nitrogen fixation The different series of nitrogen compounds, or the various stages of oxidation are closely interrelated (see table) **activated-** Excited **active-** A chemically-active form of nitrogen, which is considered by some to be analogous to ozone, N_3, by others to be of atomic character It has a characteristic afterglow **alloxuric-** The N contained in organic tissues which is bound in purine bases **alpha-** See *n molecule* **ammonia-** The N of the NH_4 group of ammomniu salts **atmospheric-** The N of the atmosphere, q v **beta-** See *n molecule* **carboxyl-** α-amino acid

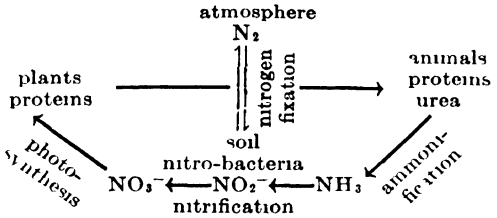
NITROGEN COMPOUNDS

Valence	Oxide or hydride	Hydroxide or acid	Derivatives
+5	N_2O_5	HNO_3	nitrates
+4	N_2O_4		
+3	N_2O_3	HNO_2	nitrites
+2	N_2O_2		
+1	N_2O	$H_2N_2O_2$ — HNO	hyponitrites
±0	N_2		nitrogen
−1	(NH)	NH_2OH	hydroxylamines
−2	N_2H_4		hydrazines
−3	NH_3	NH_4OH	ammonium salts

Reduction ↓ Oxidation ↑

nitrogen **excited-** The N which has been exposed to radiations and low pressures and has become luminous, due to the electrons passing back from the excited to the normal state $N^* = N + h\nu$ **filtrate-** Rest n **fixed-** See *n fixation* **formol-** The N of the NH_2 group of amino acids See *formol titration* **free-** Uncombined N, as in the atmosphere, or the elementary N which enters vegetable or animal tissues (leaves or lungs) **hydro-** See *hydronitrogens* **ionized-** The atoms or molecules of nitrogen which have become ionized at low pressures, and are the cause of certain lines in the spectra of aurora, corona, nebulas and stars They are indicated as NI for singly- and NII for doubly-ionized N **ortho-** See *n molecule* **oxides of-** See *nitrous oxide* (N_2O), *nitric oxide* (NO), *nitrogen peroxide* (N_2O_4), *nitrogen pentoxide* (N_2O_5) **para-** See *n molecule* **protein-** The N contained in the protein portion of the tissues **radio-** A short-lived isotope of mass 13, obtained by bombardment with alpha-particles Cf *radio elements* **soil-** The N found in the soil as nitrate or nitrites **urea-** The N eliminated as urea

n apparatus. A glass apparatus for the determination of N in urine **n balance** The relation of n intake (proteins) to the n output (urea, uric acid) of the human body In the normal adult it is equal **n benzide** Azobenzene **n carbon monoxide.** $CO(N_3)_2 = 112\ 06$ The compound, $N_3—CO—N_3$ **n cycle** The passage of nitrogen from the atmosphere to the soil by means of gaseous nitrogen compounds produced as a result of climatic changes (*e g*, thunder storms), through bacteria to the plant, from the plant to the animal body, and thence back to the soil as excreta



n degradation The annual loss of N from the soil by crops In U S it is estimated as

Removal of N by crops	9,000,000 tons
Returned as fertilizer	5,466,000 tons
Degradation, or loss	3,534,000 tons

n dioxide Nitric oxide **n equilibrium** The state of an organism in which the N in the food equals the amount of N in the excreta during a definite period **n equivalent** The amount of nitrogen contained in proteins 1 gm nitrogen is equivalent to 6 25 gm of protein, or 1 gm of protein to 0 16 gm of nitrogen **n fixation** A process by which atmospheric nitrogen is made into a compound, two types

(a) natural processes
  (1) Non-symbiotic fixation—the direct conversion of atmospheric nitrogen to nitrates by soil bacteria, as, azotobacter
  (2) Symbiotic fixation—the gradual conversion of atmospheric nitrogen into nitrates by the intermediate formation of ammonia and nitrites Each step is due to a certain group of bacteria, as nitrosococcus, nitrosomonas, etc

(b) artificial processes
  (1) The electric arc process—the direct union of nitrogen and oxygen to oxides of nitrogen at 2800–3300°C in the electric arc It requires 12 HP-year for each ton of nitrogen
  (2) Furnace process (Hausser process)—the direct union of oxygen and nitrogen in an electric furnace
  (3) Haber process—the direct catalytic union of nitrogen and hydrogen to form ammonia at 200 atm pressure and 600°C It requires ½ HP-year for each ton of nitrogen
  (4) Claude process—similar to the Haber process, but at 900 atm pressure
  (5) Casalle process—similar to the Haber process, but uses 600 atm pressure
  (6) Nitride process (Serpek process)—the formation of metallic nitrides $Al_2O_3 + 3C + N_2 = 2AlN + 3CO$ at 1750°C It requires 2 HP-year for each ton of nitrogen
  (2) Cyanamide process—the formation of calcium cyanamide from calcium carbide and nitrogen at 1100°C It requires 2 HP-year for each ton of nitrogen

(8) Cyanide process (Bucher process)—the formation of cyanides, as $Na_2CO_3 + 4C + N_2 = 2NaCN + 3CO$ at 1000°C It requires 1½ HP-year for each ton of nitrogen

World consumption (1926)

atmospheric n	588,000 tons
(ammonia n	408,000 tons)
(cyanamide n	150,000 tons)
(arc process	30,000 tons)
coal distillation	333,000 tons
Chilean nitrate	324,000 tons

In 1935 the World's nitrogen-fixation production was

Germany	33 3 %	England	2 6 %
Japan	16 8 %	Poland	1 7 %
France	8 9 %	Yugoslavia	1 1 %
United States	8 8 %	Czechoslovakia	1 0 %
Norway	5 9 %	Switzerland	0 5 %
Italy	5 9 %	Manchuria	0 5 %
Netherlands	5 3 %	Sweden	0 4 %
Belgium	3 7 %	Spain	0 3 %
Canada	3 1 %	Rumania	0 1 %

n iodide $N_2H_3I_3$ = 411 80 A dark-red explosive compound, d 3 5, soluble in water **n lag** The time elapsing between protein intake and the appearance of an equivalent amount of nitrogen compounds in the urine **n molecule** Like the hydrogen molecule (q v) normal N_2 is a mixture of 1 part *ortho*-N or β-N with odd rotational quantum numbers, (1 3 5 7), and 2 parts *para*-N or α-N with even rotational quantum numbers (0 2 4 6) **n monoxide** Nitrous oxide **n output** An indication of protein metabolism by an analysis of the waste materials The daily nitrogen output is

	N-rich diet	N-poor diet
Total N_2	14 8–18 2 gm	4 8–8 0 gm
Distributed as follows		
Urea-nitrogen	86–89 %	62–80 %
Ammonia-nitrogen	3–5 %	4 11 %
Creatinine-nitrogen	3–4 %	5–11 %
Uric acid-nitrogen	0 5–1 %	1–2 5 %
Undetermined nitrogen	3–5 %	5–15 %

n oxychloride NOCl = 65 5 Nitrosyl-chloride Yellow or red crystals or a colored gas, $d_{air=1}$ 2 31, m −60, b −5, decomp by water It is a constituent of aqua regia, and a strong oxidizing agent **n partition** The distribution of the total nitrogen in urea, ammonia, uric acid, and other compounds (see *nitrogen output*) **n pentoxide** N_2O_5 = 108 0 Nitric acid-anhydride Colorless crystals, d 1 64, m 30, b 46, (decomp), soluble in water forming nitric acid **n peroxide** N_2O_4 or NO_2 = 46 0 An isomer of nitrogen tetroxide Colorless crystals, m −9 3, b 22, or a brown gas of irritating odor **n sulfides** (1) N_4S_4 = 184 28 An orange-red crystalline solid, d 2 2, m 179, decomp 185, or by water, sublimes at 135 (2) N_2S_5 = 188 32 Nitrogen pentasulfide A deep red liquid $d_{18°}$ 1 9000 m 10–11, decomp by heat **n sulfochloride** N_3S_4Cl Thiazylchloride **n tetroxide** N_2O_4 = 92 0 An isomer of nitrogen peroxide A colorless crystalline mass at low temperatures, d 1 49, m −9, b 22, soluble in water **n tribromide** NBr_3 = 253 77 A dark red, volatile explosive oil **n trichloride** NCl_3 = 120 39 A dark liquid, exploding at 95 **n trifluoride** NF_3 = 71 01 A liquid, m −−200 **n trioxide** N_2O_3 = 76 0 A bluish-green liquid, d 1 447, m −103, b 3 5, soluble in water

nitrogenated Containing nitrogen **n oil** Describing an oil containing nitrogen compounds, as oil of bitter almonds

nitrogenium The Latin name for nitrogen

nitrogenization The act of combining with nitrogen, or of impregnating with nitrogenous compounds

nitrogenize To combine with nitrogen, or to impregnate with nitrogenous compounds

nitrogenous A compound containing nitrogen, or a substance containing nitrogen compounds **n equilibrium** A condition in metabolism, in which the intake and output of nitrogen are equal **n food** An article of food containing proteins **n tankage** Process tankage A fertilizer made by digesting nitrogenous waste materials (wood, felt, leather, hair, feathers, etc) with steam under pressure, sometimes adding sulfuric acid, drying and grinding

nitroglucose $C_6H_9O_5NO_3$ = 207 2 Yellowish crystals, used medicinally as an arterial stimulant

nitroglycerin $C_3H_5(ONO_2)_3$ = 227 1 Glyceryl nitrate, nitroglycerol, trinitrin, agioneurosin, nitric ester of glycerin, glonoin, trinitroglycerin, propenyltrinitrate, nitroleum, blasting oil A colorless or pale yellow oil, d 1 60, m 13, explodes 260, insoluble in water, soluble in alcohol or ether Used in the preparation of explosives, and medicinally, as a vasodilator

nitroglycerol Nitroglycerin

nitro group Nitryl The monovalent —NO_2 group

nitroguanidine $NO_2NH\,CNH\,NH_2$ = 104 1 Colorless needles, m 230 (decomp), slightly soluble in water, soluble in alcohol, ether or potassium hydroxide

nitrohydrochloric acid Aqua regia

nitroic acids A group of compounds containing the monovalent—$NO(OH)_2$ radical

nitroleum Nitroglycerin

nitrolevulose Levulose nitrate, dextrose nitrate Yellow crystals, which explode when heated

nitrolic acid A series of organic compounds of the type, $R—C\begin{matrix}NOH\\NO_2\end{matrix}$, thus,

H C(NOH)NO_2 is methylnitrolic acid, or nitroformoxime, m 64

$CH_3—C(NOH)NO_2$, ethylnitrolic acid or nitro-acetoxime, m 80

$CH_3\,CH_2\,C(\,NOH)NO_2$, propylnitrolic acid, m 60

The solutions of nitrolic acids are deep red

nitrolim(e) Calcium cyanamide

nitrols A series of organic compounds of the type,

$R_2{=}C\begin{matrix}NO\\NO_2\end{matrix}$, or $R\,CH\begin{matrix}NO\\NO_2\end{matrix}$,

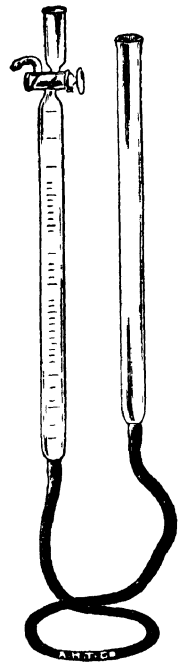
thus, $(CH_3)_2{=}C(NO)NO_2$, propyl-pseudonitrol The solutions of nitrols are deep blue

nitromagnesite A native magnesium nitrate, $Mg(NO_3)_2\,xH_2O$

nitromannite Mannitol nitrate

nitrometal An addition-compound (nitroxyl) of nitric oxide and metallic oxides, *e g* , Cu_2NO_2, Ni_2NO_2, or Co_2NO_2 They form nitrites and NO with water, and are decomposed by heat into the metal and NO_2

nitrometer A glass apparatus for measuring nitrogen or other gases evolved during a chemical reaction It consists essentially of a buret (a eudiometer with a two-way stopcock connecting the air or a funnel to the buret) in which NO is liberated from the sample by concentrated sulfuric acid in the presence of mercury



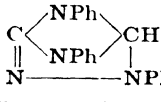
Nitrometer

nitromethane CH_3NO_2 = 27 0 Nitrocarbol A heavy, colorless liquid, d 1 14, m −26, b 101 slightly soluble in water, soluble in alcohol or ether

nitromonas A group of soil bacteria that convert ammonium salts into nitrites and nitrates They will not grow in organic media

nitromuriatic acid Aqua regia

nitron (1) $C_{20}H_{16}N_4$ = 312 39 1 4-Diphenyl-3 5-endo-anilino-4 5-dihydro-1 2 4-triazole, *4 5*-dihydro-*1 4*-diphenyl-*3 5*-phenyl-imino-*1 2 4*-triazole,



Yellow crystalline needles, insoluble in water, slightly soluble in alcohol or ether, soluble in chloroform or acetone Used for the detection and determination of nitrates (2) An early (Greek) name for trona Cf *nitrone*

n nitrate $C_{20}H_{16}N_4\,HNO_3$ = 375 3 An insoluble precipitate formed by nitrates and nitron

nitronaphthalene $C_{10}H_7NO_2$ = 173 1 **alpha-** Yellow crystals d 1 33, m 61, b 304, insoluble in water, soluble in alcohol or ether Used technically in organic synthesis, and to remove the fluorescence from oils **beta-** Colorless, rhombic needles, m 79, b 165, insoluble in water soluble in alcohol or ether, used in organic synthesis

nitronaphthoic acid $C_{10}H_6(NO_2)COOH$ = 217 1 A group of acids, colorless prisms, slightly soluble in water, soluble in alcohol or ether **2 1-** or 2-*α*- m 218, **3 1-** or 3-*α*- m 168, **4 1-** or 4-*α*- m 164 **5 1-** or 5-*α*- m 171 **8 1-** or 8-*α*- m 215 **1 2-** or 1-*β*- m 103, **5 2-** or 5-*β*- m 147, **6 2-** or 6-*β*- m 158, **8 2-** or 8-*β*- m 145

nitronaphthol $C_{10}H_6(NO_2)OH$ = 189 1 **2 1-** Colorless leaflets, m 128 **1 2-** Yellow crystals, m 103 **4 1-** Yellow needles, m 164, **5 2-** Yellow needles, m 147, **8 2-** Yellow needles, m 144 **1 5-** Yellow needles, m 171 **3 1-** m 168 **6 2-** m 158 They are all soluble in alcohol or ether and used in organic synthesis

nitronaphthylamine $C_{10}H_6(NO_2)NH_2$ = 188 **2 1-** Yellow prisms m 144, **1 2-** Orange-yell needles, m 126, **5 2-** Red needles, m 1 **8 2-** Red needles, m 103 They are all solul in alcohol or ether and used in organic sy thesis **1 4-** m 191 **1 8-** m 97, **1 5-** m 118

nitrone (1) The trivalent radical =C NO- as in phenylnitrone $Ph_2C\,N(O)—Ph$ (*nitron* (2) $CH_2\,NH\,O$

nitronic acid A group of compounds contain the $=N\langle^{O}_{OR}$ radical

nitronitroso- See *pseudonitrols*

nitropentaerythrol $C_5H_{11}O_4\,NO_3$ = 165 09 explosive

nitrophenetol $C_8H_9O_3N$ = 167 08 C_2H_5O (H_4NO_2 **ortho-** Yellow crystals m 2 1, b 57m 267 **meta-** Yellow crystals m 34, b 2(**para-** Yellow crystals m 57 8, b 758mm 283

nitrophenol $C_6H_5O_2N$ = 139 05 $C_6H_4(NO$ OH **ortho-** Yellow prisms, m 45, b 2 slightly soluble in water, soluble in alcohol ether **meta-** Yellow tablets, m 96, sligh soluble in water, soluble in alcohol or eth **para-** Colorless monoclinic crystals, m 1 decomp 279, slightly soluble in water, solu in alcohol or ether Used in organic synthe for the manufacture of rhodamine dyestu phenolphthalein, phenacetin, etc The pa compound is also used as an indicator alkalimetry, and as a pH indicator for blc and seawater, changing at pH 6 from colorl (acid) to yellow (alkaline) **chloro-** C_6 $ClNO_3$ = 173 50 Chloro-nitro-hydroxy b zene, $Cl\,C_6H_3(OH)NO_2$ A group of sol used in organic synthesis The first num indicates Cl, the second NO_2, while OH assumed to be in the 1-position **4 2-** m **5 2-** m 38 9, **6 2-** m 70, **2 3-** m 120, **4 3-** m 1 **5 3-** m 147, **6 3-** m 118 **2 4-** m 111, 3 m 133

nitrophenols A group of organic compoun derived from phenol by the substitution one or more nuclear hydrogen atoms by nitro group

mono- containing one nitro-group, $C_6H_4(NC$ OH

di- containing two nitro-groups, $C_6H_3(NO_2)$ (

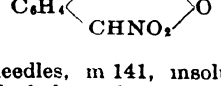
tri- containing three nitro-groups, $C_6H_2(NO$ OH (see *picric acid*)

tetra- containing four nitro-groups, $C_6H(NO$ OH

nitrophoska A fused, ternary mixture of KN NH_4Cl and $(NH_4)PO_4$, used as a fertilizer

nitrophthalic acid $C_6H_3(NO_2)(COOH)_2$ = 211 **3-** Yellow, monoclinic crystals, m 220, sligh soluble in water, soluble in alcohol or eth **4-** Colorless needles, m 161, soluble in wat alcohol, or ether, used in organic synthesis

nitrophthalide $C_8H_5O_4N$ = 179 2



Colorless needles, m 141, insoluble in wat soluble in alcohol or ether

nitropropane $C_3H_7NO_2$ = 89 1 A colorl liquid, d 1 01, b 131, slightly soluble in wat soluble in alcohol or ether

nitroprussiate Nitroprusside

nitroprusside A compound containing the valent $[Fe(NO)(CN)]_5$ = radical

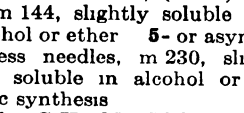
nitroquinoline $C_9H_6N\,NO_2$ = 174 1 **5-** Colorless needles, m 72, slightly soluble in water, alcohol, or ether **6-** Colorless needles, m 150, slightly soluble in alcohol, water, or ether **7-** Colorless needles, m 132, soluble in alcohol or ether **8-** Colorless needles, m 88, insoluble in water, soluble in alcohol or ether Used in organic synthesis, and as reagent for palladium

nitrosalicylic acid $C_6H_3(NO_2)(OH)COOH$ = 183 1 **3-** or meta-, (3 2 1-) Long, white needles, m 144, slightly soluble in water, soluble in alcohol or ether **5-** or asymmetric-, (5 2 1-) Colorless needles, m 230, slightly soluble in water, soluble in alcohol or ether Used in organic synthesis

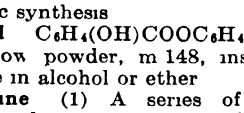
nitrosalol $C_6H_4(OH)COOC_6H_4NO_2$ = 259 08 A yellow powder, m 148, insoluble in water, soluble in alcohol or ether

nitrosamine (1) A series of yellow organic compounds containing the bivalent =N NO radical They are obtained by the action of nitrous acid on secondary amines, and differ from nitrosoamines which contain the $—NH_2$ and —NO radicals *E g*, **diethyl-** $Et_2N\,NO$ Nitrosodiethyline, b 177 **dimethyl-** $Me_2N\,NO$ Nitrosodimethyline, b 148 **diphenyl-** Ph_2N-NO **phenylethyl-** PhEtN NO **phenylmethyl-** PhMeN NO (2) A compound containing the monovalent —NH NO radical, as **ethyl-** EtNHNO **methyl-** MeNHNO **phenyl-** PhNHNO

nitrosates A series of organic compounds containing the trivalent

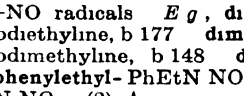


group, as, isoamylene nitrosate,

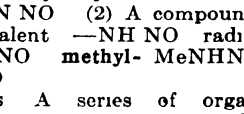


nitrose A solution of nitrosyl sulfuric acid in sulfuric acid, made by passing NO_2 and NO into sulphuric acid

nitrosites A series of organic compounds containing the trivalent



group, as *isoamylene nitrosite*



nitroso Oximido, hydroximino The monovalent radical, —NO, containing trivalent nitrogen **iso-** The monovalent radical, —N OH **oxy-** Nitrito **n R salt** $C_{10}H_4OH\,NO(SO_3Na)_2$ which gives a blue color with cobalt and iron only

ι-nitrosoacetophenone Benzoylformoxime

nitrosoamines A series of organic compounds containing both the $—NH_2$ and —NO radicals, as, nitrosoaniline Cf *nitrosamines*

nitrosoaniline $C_6H_4(NO)NH_2$ = 122 1 **para-** Steel-blue needles, m 174, insoluble in water, soluble in alcohol or benzene, used in the synthesis of organic dyestuffs

nitrosobacter A rod-like form of nitrifying bacteria

nitrosobacteria Nitrifying bacteria See *nitromonas*

nitrosobenzene C_6H_5NO = 107 1 Blue monoclinic needles m 68, soluble in alcohol or ether

nitrosobenzoic acid $C_6H_4(NO)COOH$ = 151 1 **ortho-** Colorless crystals, decomp 210, very slightly soluble in water, alcohol or ether

nitrosococcus A round-shaped nitrifying bacteria of the soil, converts ammonia to nitrites Cf *nitrosomonas*

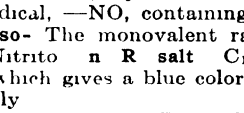
nitrosodiethylamine $(C_2H_5)_2N\,NO$ = 102 1 Nitrosodiethyline, diethylnitrosamine A yellow, oily liquid, d 0 951, b 177, soluble in water, alcohol, or ether, used in organic synthesis

nitrosodiethylaniline $C_6H_4(NO)NEt_2$ = 178 2 **para-** Colorless needles, m 84, slightly soluble in water alcohol or ether

nitrosodimethylamine $(CH_3)_2N\,NO$ = 74 1 Nitrosodimethyline dimethylnitrosamine A yellow, oily, liquid, b 148, soluble in water alcohol, or ether

nitrosodimethylaniline $C_6H_4(NO)NMe_2$ = 150 1 **para-** Green scales, m 88, slightly soluble in water, soluble in alcohol or ether, used in the manufacture of dyestuffs **n hydrochloride** $C_6H_4(NO)NMe_2\,HCl$ = 186-45 Yellow needles soluble in water, alcohol, or ether, used in the manufacture of dyes

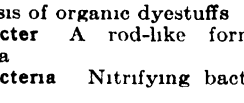
nitroso dyes A series of dyestuffs derived from quinone oxime, which contains the chromophore group



nitrosoethane C_2H_5NO = 59 1

nitrosohydroxylamines A series of organic compounds containing the monovalent $—N\langle^{NO}_{OH}$ radical as, phenyl-nitroso-hydroxylamine $C_6H_5N(OH)NO$

nitrosoketones A series of compounds containing the bivalent



group, *e g*, isonitroso-acetone, Me CO CH(NOH), isonitrosomethyl-acetone, MeCO CMe(NOH)

nitrosomonas A soil bacterium of Europe Asia, and Africa that converts ammonia into nitrites Cf *nitromonas, nitrosococcus*

nitrosonaphthol $C_{10}H_6(NO)OH$ = 173 1 **alpha-alpha-,** 4-nitroso-1-hydroxy-naphthalene Yellow crystals, m 194, insoluble in water, soluble in alcohol or ether **alpha-beta-,** 1-nitroso-2-hydroxy-naphthalene Yellowish prisms, m 110, slightly soluble in water, completely soluble in alcohol or ether **beta-alpha-,** 2-nitroso-1-hydroxy-naphthalene Yellow needles, m 162, slightly soluble in water, completely soluble in alcohol or ether They are used in organic synthesis, and as reagents for cobalt

nitrosonaphthylamine $C_{10}H_6(NO)NH_2$ = 172 1 **alpha-beta-,** 1-nitroso-2-amino-naphthalene Green needles, m 150, slightly soluble in hot water, soluble in alcohol or ether, used in organic synthesis

nitrosonitric acid Fuming nitric acid

nitrosophenol $C_6H_5O_2N$ = 123 1 $OH\,C_6H_4-NO$ A solid m 140 (decomp), soluble in water, alcohol or ether See also *quinone monoxime*, its tautomeric form

nitrosophenyldimethyl pyrazole $C_{11}H_{11}O_2N_3$ = 217 2 A reaction-product of antipyrine and nitrites in acid solution Green needles, exploding at 200, soluble in ether, chloroform, or alkalis, used as an antipyretic and diuretic

nitrososulfuric acid Nitrosyl sulfate

nitrosotoluene $C_6H_4(NO)CH_3$ = 121 1 **ortho-** Yellow needles, decomp 120, soluble in water, alcohol or ether, used in organic synthesis

nitrostarch Starch nitrate, $[C_{12}H_{12}O_{10}(NO_2)_3]n$ A nitrated starch used in the manufacture of explosives An orange powder, soluble in alcohol or ether

nitrostyrene $NO_2C_6H_4CH\ CH_2$ = 149 1 Nitrostyrolene **ortho-** A colorless liquid, m 12 (decomp) insoluble in water, soluble in concentrated sulfuric acid **meta-** A colorless liquid, m 15 8, b 235, soluble in alcohol or ether **para-** Colorless prisms, m 58, b 254, soluble in hot alcohol or ether

nitrostyrolene Nitrostyrene

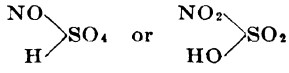
nitro-substitution The result of the process of nitration (q v)

nitrosulfamide $H_2N\ SO_2\ NHNO$ = 125 2 A colorless liquid obtained by nitrating sulfamide Its silver salt is used as a detonator

nitrosulfonic acid Nitrosyl sulfate

nitrosulfuric acid A mixture of one part nitric acid and two parts sulfuric acid, used as a nitrating agent Cf *nitrosyl sulfuric acid*

nitrosyl The nitroso radical, NO—, when attached to a strongly electro-negative element or group, as, Cl— or —HSO_4 **n bromide** NOBr = 109 93 A brown liquid decomp −2 **n chloride** NOCl Nitrogen oxychloride **n fluoride** NOF = 49 01 A gas, m −134, b −56 **n perchlorate** $NOClO_4$ = 129 47 An unstable liquid **n sulfate** NO-HSO_4 = 111 1 Nitrososulfuric acid, chamber crystals nitrosulfonic acid, n sulfuric acid, nitrose



Colorless crystals, m 75 (decomp), formed in the lead chambers during the manufacture of sulfuric acid **n sulfuric acid** N sulfate **n sulfurylchloride** $ClSO_4ONO$ = 177 54 A crystalline solid, produced from sulfur trioxide and nitrosyl chloride

nitrothiophen $NO_2C_4H_3S$ = 129 1 Colorless crystals, m 44, b 224, insoluble in water, soluble in alcohol or ether

nitrotoluene $C_7H_7O_2N$ = 137 1 $MeC_6H_4NO_2$ **ortho-** A yellow liquid, d 1 168, m −3 8, b 218, insoluble in water, soluble in alcohol or ether **meta-** Yellow crystals or liquid, m 16, b 230, insoluble in water, soluble in alcohol, ether, or benzene **para-** Yellow crystals, m 54, b 238 insoluble in water, soluble in alcohol or ether They are used in organic synthesis **di-** q v **tri-** See *trinitrotoluene*

nitrotoluidine $C_6H_3(NO_2)(NH_2)CH_3$ = 152 12 A series of nitro-amino-methyl-benzenes, used in the synthesis of dyestuffs They are usually slightly soluble in water, soluble in alcohol, ether or benzene According to the positions of the three groups in the benzene ring there are

NO_2	NH_2	CH_3	
			(ortho-toluidines)
3	2	1	= Orange prisms, m 92,
4	2	1	= Yellow monoclinic crystals, m 104
5	2	1	= Yellow needles, m 127
6	2	1	= Yellow leaflets, m 92
			(meta-toluidines)
2	3	1	= Yellow needles, m 53
4	3	1	= Yellow leaflets, m 109
5	3	1	= Orange needles, m 98
6	3	1	= Yellow needles, m 138
			(para-toluidines)
2	4	1	= Yellow monoclinic crystals, m 77
3	4	1	= Red prisms, m 114

nitrourea $CH_3O_3N_3$ = 105 1 $NH_2CO\ NHN($ A white crystalline powder, decomp by he slightly soluble in water, soluble in alcohol ether

nitrourethane $NO_2\ NH\ COO\ C_2H_5$ = 134 Colorless leaflets, m 64, b 140 (decomp soluble in water, alcohol, or ether

nitrous (1) Describing nitrogen compounds co taining positive trivalent nitrogen, as nitro acid Their ammonia compounds conta negative trivalent nitrogen (2) An ear term describing a compound of nitric ac **n acid** HNO_2 = 47 0 An aqueous sol tion of nitrogen trioxide (N_2O_3) **n anhydrid** Nitrogen trioxide **n ether** $C_2H_5NO_2$ 75 047 (1) Ethyl nitrite (2) Nitroethar **n oxide** N_2O = 44 1 Nitrogen monoxi laughing gas, dental gas A colorless g d 1 529, m −90 7, b −88 4, soluble in wat alcohol, ether, or benzene Used as a surgi and dental anesthetic, and to preserve perishal organic liquids and tissues, including mi fruits, and other foods **n vitriol** A soluti of oxides of N and sometimes of SO_2 in stro H_2SO_4, formed during the manufacture H_2SO_4 (q v)

nitroxanthic acid Picric acid

nitroxyl The radical, —NO_2, when attach to a strongly electro-negative group, as or to a metal, as copper nitroxyl, $Cu_2(NC$ **n chloride** NO_2Cl = 81 47 A yellow liqu d 1 316 **n fluoride** NO_2F = 65 0 A col less gas m −139, b −63 5, rapidly decomp water

nitroxylene. $C_8H_9O_2N$ = 151 1 Me_2C_6H NO_2 **1 2 3-** A yellow liquid, d 1 147, m b 250 **1 2 4-** Ortho- Yellow crystals, d 1 1 m 29, b 258 **1 3 2-** Meta- A yellow liqu d 1 112, m 13, b 225 **1 3 4-** A liquid, d 1 1 b 238 **1 3 5-** A solid, m 74, b 275 **1 4** Para- A yellow liquid, d 1 132, b 239 Th are all insoluble in water, soluble in alcoh ether, benzene, or chloroform, and are used organic synthesis

nitroxylic acid H_2NO_2 = 48 0 Hydronitr acid The hypothetical acid from wh nitroxyls (q v) are derived

nitrum An early (Latin) name for trona

nitryl Nitro-group The monovalent radic —NO_2 derived from nitrous acid, HN(**n fluoride** Nitroxyl fluoride

nivalic acid $C_{20}H_{26}O_6$ = 362 22 An acid fr the lichen, *Cetraria nivalis*

nivenite A variety of uranite containing large proportion of rare earths

nizin Zinc sulfanilate

No Atomic number, also Z (German zahl)

No 606 Salvarsan **914** Neosalvarsan

Nobel, Alfred Bernhard 1833–1896 A Swed chemist, the inventor of several explosi and artificial rubber, noted as the founder the Nobel Prize **N 's explosive** A hi explosive consisting of 25–80 % nitroglycer 0 5–7 % guncotton, 0 4–9 % liquid nitro-boc 0 9–10 % wood meal and 6–45 % K or N nitrate Cf *dynamite* **N oil** Nitroglycer **N. Prize** An annual award from the inter of N 's capital which is divided among fi scientists who have been outstanding in t five branches of knowledge physics, chemist physiology, medicine, and world-peace T thirty chemistry awards since 1901–19 inclusive are distributed

Geographically:
Germany 13, England 4.5, France 4, U.S.A. 3, Sweden 2.5, Switzerland 1, Holland 1, Austria 1.
Departmentally:
Physical c. 9, biochemistry 7, organic 6, radioactive 5, inorganic 4, industrial 3.

Alfred Bernhard Nobel.

Noble, Alfred. 1844–1914. An American civil engineer who founded the **Noble Prize** for the best technical paper in an engineering periodical. Cf. *Nobel Prize.*

noble gas. A member of the zero group of the periodic system: He, Ne, A, Kr, Xe, and Rn. For occurrence, see *atmospheric gases.* Uses: He, for filling dirigibles; A, for rectifiers and incandescent bulbs; also in illuminating signs, with or without mercury, the following colors being produced:

Ne	fiery orange red
A	blue
Kr	pale violet
Xe	sky blue or green.

n. laurel. Laurel. **n. liverwort.** Liverwort. **n. metal.** A metal which is not readily oxidized, in particular the metals of the gold, platinum, and palladium family of the periodic system.

noctal. $C_{10}H_{13}BrN_2O_3$ = 189.00. Nostal, *i*-propyl-β-bromo-allyl barbituric acid. White powder, m.178, used as a narcotic.

nodakenin. $C_{20}H_{24}O_9$ = 408.15. A glucoside from nodake, *Pellecedanum decursivium*, an Umbelliferae of Japan.

node. The point at which a curve or wave-motion intersects a fixed plane.

nodular. Resembling a knot or protuberance.

nodule. A small round lump, as of a mineral or earth.

noise. See *loudness, sound, decibel.*

nomenclature. The systematic terminology of chemical compounds, cf. *notation.* **Geneva-** A set of rules adopted at the International Conference on chemical nomenclature held in Geneva in 1892. These rules refer mainly to organic compounds and have since been altered in many respects (see Report 1937). The general rules for the nomenclature are:

INORGANIC COMPOUNDS

Binary compounds:
The positive element (metal) is named first, and followed by the electronegative element (nonmetal).
metal suffixes:
-ous indicates the lower valence, as ferr*ous*-
-ic indicates the higher valence, as ferr*ic*-
nonmetal suffixes:
-ide as ox*ide*, hydrox*ide*, chlor*ide*, sulf*ide*, nitr*ide*.

Tertiary compounds:
acids:
-ous acid, indicating a lower valency, as chlor*ous* or sulfur*ous* acid.
-ic acid, indicating a higher valency, as chlor*ic* or sulfur*ic* acid.
If there are more than two stages of oxidation, then:
hypo- ous, the acid of lowest valency; as *hypo*chlor*ous* acid.
per- ic, the acid of highest valency; as *per*chlor*ic* acid.
salts:
-ite, when derived from an *ous*-acid, as chlor*ite*, or sulf*ite*.
-ate, when derived from an *ic*-acid, as sulf*ate* or chlor*ate*.

ORGANIC COMPOUNDS

-ane, for saturated hydrocarbons (meth*ane*, eth*ane*, menth*ane*).
-ene, for unsaturated hydrocarbons containing one double bond (eth*ene*, prop*ene*) or double bonds (benz*ene*, naphthal*ene*).
-diene, for unsaturated alkyl hydrocarbons containing two double bonds (buta*diene*).
-ine, for unsaturated hydrocarbons containing a triple bond (eth*ine*).
-enine, for hydrocarbons containing a double and triple bond (but*enine*).
cyclo-, for hydrocarbons which form a closed saturated chain (*cyclo*pentene).
-ine, for alkaloids, (morph*ine*, coca*ine*, strychn*ine*).
-in, for glucosides (sapon*in*).
-one, for ketones (also -dione, -trione).
-ose, for carbohydrates (also -pentose, -hexose etc.).
-ol, for alcohols and phenols (also -diol, -triol).
-al, for aldehydes (also -dial, -trial).
-ase, for enzymes (pep*sase*).
-oid, for an active principle of unknown composition.
-yl, for a radical.
-ino, for an ammonia derivative (amino).
-ido, for an ammonia derivative substituted in an acid group: amido —$CONH_2$.
-thial, for thioaldehydes (—CSH group).

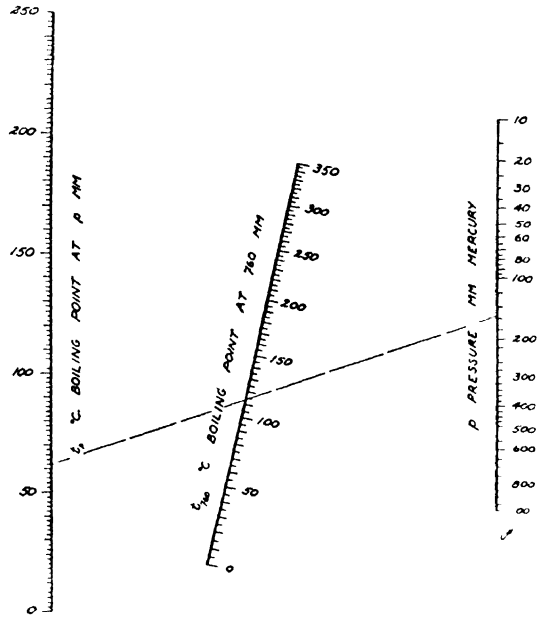
SPECIFIC NAMES

hydrate, for a compound with water, as chlorine hydrate, $Cl_2.10H_2O$.
hydroxide, for a compound containing —OH radicals, as calcium hydroxide, $Ca(OH)_2$.
hydroxy- (not oxy-), for the —OH group in an organic molecule.
-ite, for minerals.

thio- for sulfur which has replaced oxygen, as thiosulfate $=S_2O_3$, thiocyanate —CNS
sulfo- for the group, $—SO_3H$
oxy- for —O—, as in ethers, Me—O—Me

nomogram Nomograph

nomograph Nomogram Alignment chart A system of two or more graphical scales, used for the calculation of analytical results or rapid solution of complicated equations *E g*, **boiling point-** A set of scales by which the boiling point of a liquid at 760 mm may be found from its boiling point at a different pressure, and vice versa This n solves Trouton's rule and the integrated Clausius-Clapeyron equation Thus *e g*, the b 62°C (left scale) at 154 mm pressure (right scale) corresponds with 114°C at atm pressure (middle scale)



Boiling point nomograph

(D S Davis, Chemist-Analyst, 1931, 20, No 3)

nomography The representation of analytical or other correlations by means of charts and graphs, which eliminate calculations

non- (1) A Latin prefix, indicating not (2) A Greek prefix, for nine

nonacosane* $C_{29}H_{60}$ = 408 5 A hydrocarbon occurring in bees-wax and the fat of cabbage leaves A colorless paraffin-like substance, m 63, b 348

nonacosanol* $C_{29}H_{59}OH$ = 304 5 **1-** Montanyl alcohol **9-** White solid, m 75 4 **10-** m 74 8 **12-** m 74 **14-** m 79 **15-** m 83 6

nonacyclic (1) Having nine rings, as violanthrole (2) Not acyclic

nonadecane* $C_{19}H_{40}$ = 268 42 Enneadecane, enndecane A solid, d $_{32}$°0 777, m 32, b 330

nonadecanoic acid* $C_{19}H_{38}O_2$ = 298 30 Nonadecylic acid, $C_{18}H_{37}COOH$ White leaflets, m 66 5, b $_{100mm}$299

nonadecanol* $C_{19}H_{40}O$ = 284 31 Nonadecyl alcohol, $C_{19}H_{39}OH$ Opaque crystals, m 62

nonadecanone* $C_{19}H_{38}O$ = 282 30 **10-** Caprinone, dinonyl ketone, $(C_9H_{19})_2CO$ Colorless leaflets, m 58, insoluble in water

nonadecyl alcohol Nonadecanol *

nonadecylic acid Nonadecanoic acid *

nonaldehyde Pelargonaldehyde

nonane* C_9H_{20} = 128 2 A saturated aliphatic hydrocarbon A colorless liquid, d 0 718, m −51, b 149, insoluble in water, soluble in alcohol or ether **n carboxylic acid** Capric acid **n dioic acid*** Azelaic acid

nonanediol* $C_9H_{20}O_2$ = 160 16 Nonamethylene glycol, $CH_2OH(CH_2)_7CH_2OH$ Colorless liquid, b 149, slightly soluble in water

nonanenitrile* $C_9H_{17}N$ = 139 14 Pelargonic nitrile, $Me(CH_2)_7CN$ Colorless liquid, d 0 8331, m −34, b 224, insoluble in water

nonanoic acid* Pelargonic acid

nonanol* $C_9H_{20}O$ = 144 16 **1-** *n*-Nonyl alcohol **2-** Heptylmethylcarbinol, $Me(CH_2)_5CHOHMe$ Colorless liquid, d 0 8190, m −, b 193, insoluble in water, soluble in alcoh **3-** Ethylhexylcarbinol, $Me(CH_2)_5CHOH$ Colorless liquid, d 0 825, m −22, b 194 Amylpropyl carbinol, $Me(CH_2)_4CHOH$ Colorless liquid, d 0 8282, b 192 **5-** Dibutyl carbinol, $[Me(CH_2)_3]_2CHOH$ Oily liquid, 0 823, b 194

nonanone* $C_9H_{18}O$ = 142 14 **2-** Methyl heptyl ketone, $MeCO(CH_2)_6Me$ A constituent of oil of rue and oil of cloves Colorless liquid, d 0 8317, m −8 2, b 195 **3-** Ethyl hexyl ketone, $EtCO(CH_2)_5Me$ A liqu d 0 84, m −8, b 190 **5-** Dibutyl keto $[Me(CH_2)_3]_2CO$ Colorless liquid, d 0 827, m −5 9, b 186 5

nonanoyl* Pelargonyl The radical Me(CH CO— derived from nonanoic acid **n chlori** $C_9H_{17}OCl$ = 176 59 Pelargonyl chlori Colorless liquid, d 0 9590, m −60 5, b 2 decomp by water

nonconductor A substance that does not transmit electricity, heat, or light Cf *insulator*

nondecylic acid Nonadecanoic acid *

nondrying oil A liquid fat which remains fluid on exposure, and does not become ha Such fats contain olein and glycerides of oth unsaturated fatty acids, and absorb but lit oxygen *E g*, castor oil sperm oil

nonene* Nonylene

nonferrous A metal other than iron

nonine Nonyne*

nonmetal An electronegative element locat in the upper left half of the periodic syste It has no metallic properties They are ge erally polyvalent (except O and H), and ex in several stages of oxidation Their oxi form acids

nonmetallic Not of a metallic nature

nonoic acid Pelargonic acid

nonvalent Inert, having no combining pow and a valency of zero, as, the noble gases

nonyl The monovalent radical, $—C_9H_{19}$, (rived from nonane **n alcohol** $C_9H_{19}OH$ 144 2 A colorless liquid, d 0 842, m − b 213, insoluble in water, soluble in alcoh For other isomers see *nonanol** **n aldehy** Pelargonaldehyde **n amine** $C_9H_{19}NH_2$ 143 17 Colorless liquid, b 195 **n cyani** Caprinitrile

nonylene C_9H_{18} = 126 15 Nonene* A liqu hydrocarbon, d $_{20}$°0 7433, b 147

nonylic acid Pelargonic acid

nonylone *9*-Neptadecanone

nonyne* C_9H_{16} = 124 12 *n*-Heptyl-acetyle nonine, $Me(CH_2)_6C{\equiv}CH$ Colorless liquid, 0 7924, m −36, b 160, insoluble in water

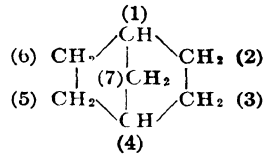
nopinene $C_{10}H_{16}$ = 136 12 β-pinene, 7 7-dimethyl-2-methylene norpinane A terpene occurring (30 %) in the oil of *Ferula galbaniflua* of Russia Cf *galbanum, asafetida*

nopinic acid $C_{10}H_{16}O_3$ = 184 12 4-Hydroxy-norpinane-4-carboxylic acid A hydroxy acid derived from norpinane Cf *pinonic acid*

nor- A prefix indicating a normal or parent compound

noratropine An alkaloid from various Solanaceae species, allied to atropine

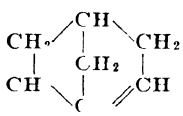
norcamphane C_7H_{12} = 96 09 1 2 2-bicycloheptane The hydrocarbon



It is the parent-compound of many terpenes **dimethyl-** Camphenilane **dimethylmethylene-** Camphene **trimethyl-** Camphane

norcamphanyl The monovalent radical, C_7H_{11}—, derived from norcamphane

norcarene C_7H_{10} = 94 08 Bicycloheptene, Δ^3-norcamphane



trimethyl- Carene

nordenskioldine [Swedish] $CaSnB_2O_6$ A tin ore

Nordhausen acid Oleum

norephedrine $C_9H_{13}ON$ = 151 11 α-amino-ethyl benzyl alcohol, $PhC(OH)NH_2Et$, used similarly to ephedrine, q v

Norge saltpeter A calcium nitrate made in Norway, and used extensively as a fertilizer

norgine Algin

norit Purified charcoal made from birch, and used to decolorize and deodorize syrup, oils or pharmaceutical products

norium A supposed rare earth element from zircon, which proved to be a mixture of various rare earth metals

norleucine $C_6H_{13}O_2N$ = 131 1 Caprine, glycoleucine, α-amino-*n*-caproic acid, α-amino-α-butyl acetic acid, 2-aminohexanoic acid* An aminoacid (q v) from the leucine fractions of proteins of the brain and of casein

norm A theoretical standard **n system** In mineralogy, a system of classification of rocks based on their theoretical chemical compositions Cf *mode*

normal (1) A plane or line perpendicular to another plane or line (2) A fixed standard or an established type, as a normal solution, or normal hydrocarbon (3) A prefix which indicates (a) a neutral salt in which all the available hydrogen atoms are replaced, (b) an organic compound in its "normal" form as distinct from its "iso" form (4) The average or mean **n atom** An atom in the unexcited state, it may differ from a *neutral* atom (q v) **n benzine** Benzine of d 0 695–0 705, b 65–95 **n element** An electrical battery or electrolytic cell, used as a standard of electromotive force See *Weston element, cadmium cell* **n glass** A glass whose composition can be represented by a definite chemical formula, as, $6SiO_2$ CaO Na_2O **n hydrocarbon** An aliphatic hydrocarbon that has a straight carbon chain in its molecule and no side-chains, as, n-pentane **n pressure** Atmospheric pressure, atmosphere The pressure of a column of mercury 760 mm high at sea-level (approximately 14 7 pounds per square inch) **n saline,** q v **n salt** A salt in which all the hydrogen atoms of the acid have been replaced by a metal, or all the hydroxide radicals of a base replaced by an acid radical

Na_2CO_3 (normal salt), $NaHCO_3$ (acid salt)

$Bi(NO_3)_3$ (normal salt), $Bi(OH)_2NO_3$ (basic salt)

n solution A solution which contains one equivalent of the active reagent in grams, in one liter The equivalent in grams may be defined as that quantity of the active reagent which contains, replaces, unites with, or in any way, directly or indirectly, brings into reaction one gram of hydrogen A *normal* solution, N, is used for titration in quantitative analysis, and it may or may not be equal in strength to the *molal* solution

N HCl = 36 5 gm HCl per liter = M HCl
N H_2SO_4 = 49 gm H_2SO_4 per liter = M/2 H_2SO_4 Weaker or stronger solutions are indicated thus, *e g*,

0 5N or N/2 = half-normal
0 1N or N/10 = tenth-normal
2N = twice normal

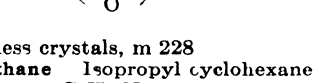
Cf *centinormal, millinormal, supernormal* **n temperature** Room temperature, 20°C or 68°F It differs from standard temperature (0°C) **n thermometer** A standardized thermometer

normality The concentration of a solution expressed in gram-equivalents per liter, thus N-solution = one gram-equivalent per liter 2N-solution = two gram equivalents per liter 0 5N or N/2-solution = one-half gram equivalent per liter Cf *normal solution*

normalization The process of restoring normality

normalizing The heat-treatment of metals (especially aluminum alloys), by the action of a molten mixture of sodium and potassium nitrates at 500°C

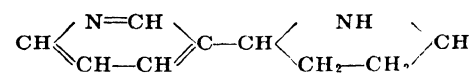
normeconine acetic acid $C_{10}H_8O_4$ = 188 1 Dihydroxyphthalide acetic acid



Colorless crystals, m 228

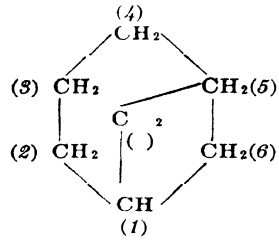
normenthane Isopropyl cyclohexane

normicotine $C_9H_{12}N_2$ = 136 11 An isomer of nicotine in Kentucky tobacco



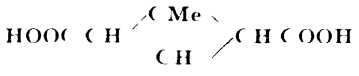
noropianic acid $C_8H_6O_5$ = 182 1 5 6-dihydroxy-phthalaldehyde acid Colorless crystals, m 171, soluble in alcohol or ether

norpinane C_7H_{12} = 96 09 1 1 3-bicycloheptane The hydrocarbon



Cf *nopinic acid* **dimethylmethylene-** Nopinene

norpinic acid $C_8H_{10}O_4$ = 170 08 2 2-dimethyl-1 3-cyclobutane dicarboxylic acid



Cf *truxillic acid nopinic acid*

Norris, Flack James, 1871– An American chemist noted for organic research

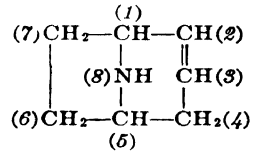
norsolanellic acid Biloidanic acid

Northrup furnace An electric high-temperature furnace

nortropane $C_7H_{13}N$ = 111 1 *2 3*-Dihydronortropidine, *1 5*-iminocycloheptane A cyclic hydrocarbon derived from nortropidine, q v

nortropene Nortropidine

nortropidine $C_7H_{13}N$ = 111 1 *1 5*-Iminocycloheptene-*2* The aromatic heterocyclic hydrocarbon



nortropinone $C_7H_{11}ON$ = 125 09 A ketone derived from tropine by oxidation, a colorless powder, m 70

norvaline $C_5H_{11}O_2N$ = 117 1 α-aminovaleric acid An aminoacid (q v) m 291, from proteins

Norwegian saltpeter Norge saltpeter A calcium nitrate used as a fertilizer

nosean An aluminum sodium silicate containing gypsum

noselite $Al_3Na_8SSi_{12}O_{16}$ A silicate mineral (q v) of the sodalite group

nosepiece A revolving disc on a microscope, into which the different objectives can be screwed

nosology The classification of disease

nosophen $C_{20}H_{10}O_4I_4$ = 821 5 **Tetraiodophenolphthalein iodophen** $(C_6H_2I_2OH)_2(CO)_2C_6H_4$ A yellow powder, m 225, slightly soluble in alcohol or ether soluble in alkalis, used as an iodoform substitute **bismuth-** Eudoxin **mercury-** Apallagin **sodium-** Antinosin

nostal Noctal

nostrum A "cure-all," or quack medicine

notatin Penatin Penicillin A An antibacterial glucose aerodehydrogenase from the mold *Penicillium notatum* (cf *penicillin*)

notation A system of numerals, or numerals and symbols, which indicate the structural characteristic of an organic compound The principal symbols are

a—asymmetric, or alpha-position
α—ana-position, alpha-position, or first carbon atom
β—beta-position, or second carbon-atom
c—cyclic, or cis-type
d—dextro-rotatory
dl—racemic
δ—fourth carbon atom
ϵ—epi-position, or fifth carbon atom
γ—gamma-position, or third carbon atom
i—iso or inactive
κ—kata-position
l—levorotatory
m—meta-position or mesoisomer
μ—meso-position
n—normal or nitrogen substitute
o—ortho-position or oxygen substitute
ω—substitution in the side-chain or on the carbon atom farthest from a functional group
p—para-position or primary
π—peri-position
r—racemic
ρ—pros-position
s—syn-type, symmetric secondary or sulfur substitute
t—trans-type, or tertiary
v—vicinal position
ψ—pseudo
φ—amphi-position
Δ—Double bond as Δ a double bond between the second and third carbon atoms, $\Delta^{(4)}$, a bond between the second fourth carbon atoms of a ring
T—Triple bond

Cf *formula nomenclature* See also definition(s) under each letter

n of energy levels See *quantum numbers*

n of isotopes See *hydrogen, isotopes, nuclear reactions*

noumeite Garnierite

novaculite Razor stone A fine-grained rock used as an abrasive

novadelox A mixture of 1 part benzoyl chloride and 3 (or 5) parts calcium phosphate, used to bleach flour

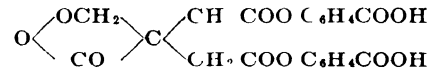
novain Carnitine

novaldin A brand of dipyrrole

novargan A silver proteinate containing silver A yellow powder soluble in water is used medicinally as an astringent and germicide

novarsenobenzol Neosalvarsan

novaspirin $C_{21}H_{16}O_{11}$ = 444 1 Methylene trisalicylic acid, salicitrin



A white, odorless powder, insoluble in water soluble in alcohol, used medicinally as an antirheumatic and antiseptic

novasurol Merbaphen the double salt of sodium mercury chlorophenoxy acetate and diethyl malonyl urea White crystals, soluble in water, used as a diuretic and antisyphilitic

novatophan Neocinchophen A trade name

novatropine $C_{16}H_{21}NO_3$ MeBr Homoatropine methyl bromide A white powder, used as an antispasmodic

novocaine Procaine **n oxide** $C_{12}H_{22}N_2O_2$ 274 2 A genalkaloid produced by the action of hydrogen peroxide on procaine, it is a more powerful anesthetic than procaine

novolak A plastic of the resole type (q v) but formed under acid conditions

noxious Harmful or hurtful **n gases** A poisonous gas or any gas of strong odor

Noyes, Arthur Amos, 1866–1936 An American chemist, noted for development of thermodynamics and chemical education **N, William Albert,** 1859–1941 An American chemist noted for organic synthesis and atomic weight determinations

N P L Abbreviation for National Physical Laboratory (q v)

n-rays A non-luminous radiation whose wave length is lower than those of visible light or heat rays, discovered in 1903 by Blondlet It is emitted by a Welsbach burner, an x-ray tube, or the sun, and passes through thin metals, and increases the luminosity of phosphorescent bodies

Nt Symbol for niton, now termed radon, Rn

NTP Abbreviation for normal temperature (0°C) and pressure (760 mm)

nu The Greek letter, ν, a symbol for frequency

nuces The Latin plural of "nut", as, nuces nucistae = nutmeg

nucin Juglone

nucitannin A glucoside obtained from walnuts It splits into glucose and rothic acid

nucite $C_6H_{12}O_6$ = 180 09 A carbohydrate from the leaves of *Juglans cinerea*, white walnut It resembles inositol Cf *juglans*

nuclear Pertaining to a nucleus, q v **n chemistry** The branch of chemical physics dealing with the changes occurring in the atomic nucleus, that is, the transmutation of elements and the production of induced radio-activity q v **n equation** An expression indicating the changes occurring in the nucleus during a n reaction, q v In a n equation both the sum of the atomic numbers (= *positive charges*) and of the isotopic weights (= *mass*) must be equal on both sides of the equation **n halogen** A term erroneously applied to a halogen attached to a ring **n particles** The building units of the atomic nucleus (see *atomic structure*) which may be classified as shown in the table **n reactions** The disruption of an atomic nucleus by bombardment with protons, deuterons or alpha-particles, which is accompanied by the emission of neutrons, protons, alpha-particles, positive or negative electrons, and the formation of excited states or radioelements, q v (see table) **n structure** (1) Each isotope consists of Z half-alpha particles (p_2e) and 1-2Z neutrons (pe), where Z is the atomic number, I the isotopic weight, p a proton with one positive charge, e an electron (2) An isotope contains Z protons and I-Z neutrons **n symbols** The symbol for an element, X is prefixed by the atomic number, Z, as subscript, and followed by its isotopic weight, I, as superscript, thus ${}_{z}X^{I}$ *E g*, ${}_{4}Be^{9}$, ${}_{2}He^{4}$

NUCLEAR REACTIONS

a Formation of gamma rays from excited intermediates of short life

$${}_{5}Be^{11} + {}_{1}H^{1} \rightarrow ({}_{6}C^{12})^{*} \rightarrow {}_{6}C^{12} + \gamma\text{-rays}$$
$$10^{-18} \text{ sec}$$
$${}_{6}C^{12} + {}_{1}H^{1} \rightarrow ({}_{7}N^{13})^{*} \rightarrow {}_{7}N^{13} + \gamma\text{-rays}$$
$$10 \text{ min}$$

b Formation of beta rays (electrons) from unstable intermediates

$${}_{11}Na^{24} \rightarrow {}_{12}Mg^{24} + {}_{-1}e^{0} \text{ (15 hrs)}$$
$${}_{12}Mg^{27} \rightarrow {}_{13}Al^{27} + {}_{-1}e^{0} \text{ (10 min)}$$

c Formation of neutrons

$${}_{8}O^{16} + {}_{1}H^{2} = {}_{9}F^{17} + {}_{0}n^{1}$$
$${}_{4}B^{9} + {}_{2}He^{4} = {}_{6}C^{13} = {}_{6}C^{12} + {}_{0}n^{1}$$
$${}_{5}B^{10} + {}_{2}He^{4} = {}_{7}N^{13} + {}_{0}n^{1}$$

d Formation of protons

$${}_{12}Mg^{26} + {}_{1}H^{2} = {}_{12}Mg^{27} + {}_{1}H^{1}$$
$${}_{14}Si^{30} + {}_{1}H^{2} = {}_{14}Si^{31} + {}_{1}H^{1}$$
$${}_{7}N^{14} + {}_{2}He^{4} = {}_{8}O^{17} + {}_{1}H^{1}$$

e Formation of alpha-particles

$${}_{12}Mg^{26} + {}_{1}H^{2} = {}_{11}Na^{24} + {}_{2}He^{4}$$

f Formation of positrons from radio elements

$${}_{7}N^{13} \rightarrow {}_{6}C^{13} + {}_{1}e^{0}$$
$${}_{9}F^{17} \rightarrow {}_{8}O^{17} + {}_{1}e^{0}$$

nuclease Any bacteriolytic enzyme that digests the nucleoproteins of bacteria

nucleate A salt of nucleic acid (q v)

nuclei The plural of nucleus

nucleic acids Nucleinic acids A group of compounds in which one or more molecules of phosphoric acid are combined with carbohydrate (pentose or hexose) molecules which are in turn combined with bases derived from purine (such as guanine and adenine) and from pyrimidine (such as thymine, cytosine and uracil) They commonly occur conjugated with proteins, as nucleoproteins The molecules of the most common nucleic acids are comprised of four phosphoric acid, four carbohydrate and two basic molecules each from purine and pyrimidine and are therefore tetranucleotides Cf *nuclein* *E g*,

from salmon	$C_{40}H_{55}N_{14}O_{26}P_4$
from thymus	$C_{43}H_{61}N_{15}O_{34}P_4$
from yeast	$C_{38}H_{49}N_{15}O_{29}P_4$
from yeast	$C_{29}H_{4}N_{13}O_{23}P$
from wheat embryo	$C_{41}H_{61}N_{15}O_{31}P_4$

NUCLEAR PARTICLES

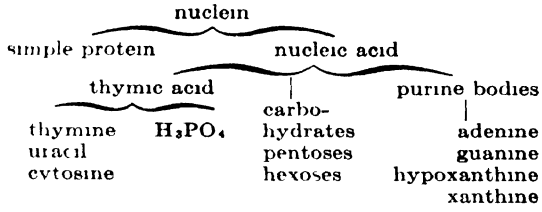
	Atomic no −1	0	1	2
Mass 0	electron $_{-1}e^{0}$ or e^{-}	neutrino $_{0}n^{0}$	positron $_{1}e^{0}$ or e^{+}	
Mass 1	neg proton $_{-1}e^{1}$	neutron $_{0}n^{1}$ or n	proton $_{1}e^{1}$ or $_{1}H^{1}$ or p	
Mass 2			deuteron $_{1}H^{2}$ or $_{1}D^{2}$	
Mass 4				alpha particle $_{2}He^{4}$ or α

nucleid A metal compound of nuclein

nuclein $C_{29}H_{49}O_{22}N_9P_3$ = 968 7 A phosphoprotein in the nuclei of cells It is obtained by peptic digestion or acid hydrolysis of albumins, and consists of nucleic acids combined with a base A grayish powder, slightly soluble in water, soluble in alkalis used medicinally as a bactericide and alterative

nucleinic acid Nucleic acid

nucleins A series of phospho-proteins occurring in the nuclei of cells They consist of nucleic acids phosphoric acids, simple proteins and xanthine bases **cell-** True nucleins **pseudo-** Nucleoalbumin



nucleoalbumin Paranuclein phosphoglobulin, pseudonuclein A combination of nucleic acid and albumin

nucleogen A compound of iron, nuclein and arsenic used in medicine

nucleol Phosphoric acid A pure nuclein from yeast

nucleoplasm (1) The protoplasm of the cell nucleus (2) The liquid portion of the cell nucleus

nucleoprotein A compound protein, which consists of a simple protein combined with nuclein and a hexose (in animals) or a pentose (in plants) They contain from 0 5–3 0 % P, and form an important part of the cell nuclei and blood **plasma** The isolated products are white powders, insoluble in water, soluble in weak alkalis and precipitated by acids

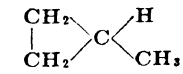
nucleoside A glucoside-like complex of a base (cytosine, thymine, etc) and a carbohydrate (hexose, pentose) contained in a nucleotide, e g cytidine, thymidine, a nucleotide (q v) without the phosphoric acid

nucleosin A thymine from the spermatozoa of salmon

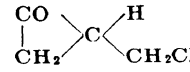
nucleothymic acid Thymic acid

nucleotide The unit atomic groups of nucleic acids HO—PO—Sugar—Base, where the PO group of one is attached to the "sugar" of the other to form polynucleotides, and the "base" is adenine, uracil, guanine, cytosine, etc Cf *nucleoside*

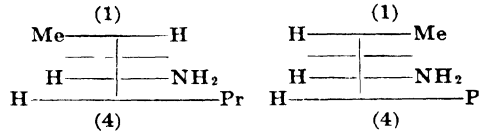
nucleus A kernel or central part **acyclic stem-** A hydrocarbon chain thus $CH_3CH_2CH_3$ is the a s n of $ClCH_2CH_2CONH_2$ **alicyclic-** A saturated carbon ring **atomic-** Proton The positively-charged center of an atom It differs from the atomic kernel, and consists of (I) positive charges and (I–N) negative charges, where I is the isotopic weight, and N the atomic number The positive charges are assumed to be hydrogen-kernels or protons Cf *nuclear reactions, particles* **benzene-** The six-carbon ring of benzene (q v) **cell-** The central part of protoplasm which is darker than the remainder, and contains structural elements (chromosomes) **condensed-** A carbocyclic or heterocyclic compound, which consists of two or more rings joined by at least two carbon atoms, as in naphthalene, anthrace **heterocyclic-** A ring compound that has anot atom besides carbon in its ring **homocyc** A ring compound which consists of only carl atoms **isocyclic stem-** A hydrocarbon ri thus,



is the *isocyclic stem nucleus* of the compound



naphthalene- The condensed nucleus occurr in naphthalene **projection-** A misnomer for graphic representation of a part of an optica active carbon ring (as, terpenes), by project the asymmetric carbon atoms Thus menth amine



where the first and third carbon atom are asy metric **stem-** The hydrocarbon obtai by replacing all other atoms (except C, H heterocyclic atoms) by hydrogen All orga compounds can then be classified as derivati of

Division I	Acyclic stem nuclei
Division II	Isocyclic stem nuclei
Division III	Heterocyclic stem nu

nugget A water-worn piece of native gold

nujol The trade name for a heavy medici paraffin oil

null instrument An instrument used to den an end-point, or point of balance betw two effects, owing to the fact that it cea to be actuated at that point, e g , the g vanometer in a Wheatstone bridge circuit

numal Allonal

number A definite and characteristic val See *atomic number, iodine number, saponifica number*, etc **preferred-** An industrial standa of the increase in size of a commodity, arran so that a certain range is divided into 5, 20, 40 or 80 steps in which the increase i constant ratio, that is 60 %, 25 %, 20 %, 6 % 3 % respectively Thus for the 5 step series

	10	16	25	40	63	or 100
	$\frac{3}{8}$	$\frac{1}{2}$	1	$1\frac{1}{2}$	$2\frac{1}{2}$	
or	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	

numbering In aliphatic compounds the carb atoms are numbered from end to end, beginni with the carbon atom having a principal radi and continuing along the longest chain aromatic compounds the numbers begin with t most saturated or the heterocyclic atom

numoquin Optochine

nupercaine Percaine

nuphatine $C_{18}H_{24}O_2N_2$ = 300 3 An alkal obtained from the bulbs of *Nuphar luteum* Nymphaeaceae (pond lily)

nutgall Galls, galla The excrescence of *Quer infectoria* a Cupuliferae, and allied speci produced by the punctures and deposit

eggs of *Cynips tinctoria* a small gall fly Nut-galls contain tannic acids, and are used medicinally as an astringent

nutmeg Myristica **n butter** Myristica oil **American-** Otoba wax **n oil** Myristica oil

nutriant A drug that modifies the nutritive processes of the body

nutrient A substance that nourishes and serves as food for a body, organism or cell

nutrilite A nutrient

nutriment Nourishment or food

nutrition The processes of taking and absorbing food, and the more remote functions of respiration, circulation, secretion and excretion connected therewith

nutrose A sodium caseinate, used with milk as a nutrient

nux A nut **n moschata** Myristica **n vomica** Poison nut, quaker nuts, quaker buttons The dried seeds of *Strychnos nux-vomica*, a Loganiaceae of Ceylon, India, and Northern Australia It contains 2 5 % alkaloids, principally strychnine and brucine, used medicinally as an extract, fluid extract or tincture as a tonic and stimulant

NW acid Neville and Winther's acid

nyctanthin $C_{28}H_{27}O_4$ = 331 22 A crystalline principle from the tree of sadness, *Nyctanthes arbortristis*, an Oleaceae

Nylander, Claes Wilhelm 1835-1902 A Swedish chemist, noted for his work in biochemistry **N reagent** A solution of 4 gm potassium-sodium tartrate, 10 gm sodium hydroxide, 2 gm bismuth subnitrate in 100 cc water **N test** A test for sugar in urine Add 1 part N reagent to 10 parts of urine A black coloration or precipitate indicates the presence of sugar

nylon A trade name for a synthetic base for rayon, discovered in 1928 and developed by E I du Pont de Nemours & Co , Inc It includes a group of thermoplastic long-chain super polyamides (q v) produced by polymerisation from the basic raw materials coal (benzene), air and water, and characterised by molecular orientation along the long axis of cold-drawing, it therefore has a high strength and elasticity, and is used for "sheer" hosiery, substitute hair bristles gut, etc General formula $NH(CH_2)_x NH\,CO(NH_2)_y\,CO\,NH\text{-}(CH_2)_x$ etc

nystagmus An involuntary oscillatory movement of the eyeballs It is an occupational disease (*e g* , of miners) due to inadequate light reaching the eye

Nyrop process A method of drying and powdering substances by atomizing their solution into a heated space (*e g* , for soap)

O

O (1) The symbol for oxygen (2) Abbreviation for orange (see *colors*) **O-** A prefix indicating that the radical is attached to the oxygen atom (See *notation*) **O orbit** The fifth shell Cf *Bohr's theory, periodic system* **O shell** See *atomic structure*

o An abbreviation for *ortho-*, or the 1 2-position

Ω The Greek capital letter omega (1) The symbol for ohm (2) A symbol for the ultimate disintegration products of each of the radioactive series (lead isotopes)

ω The Greek letter omega (1) A prefix indicating substitution in a side-chain of an aromatic compound (2) The symbol for angular velocity (3) Solid angle

O M Abbreviation for organic matter

oak A genus of trees, *Quercus*, of the order Cupuliferae, which yield cork, nutgalls, quercin, and tanning materials **poison-** See *poison oak* **white-** Quercus **o bark** The cut and dried bark of oak species *Quercus robur* containing 25 % tannin, is used in tanning leather, and medicinally as an astringent **o red** $C_{28}H_{22}O_{11}$ = 534 2 A coloring matter obtained by hydrolysis of quercitannic acid **o tannin** (1) Quercin (2) Quercitannic acid

oakum A fiber made by untwisting old hemp ropes Used medicinally as a dressing and in pads, and (usually impregnated with pitch and tar) for caulking purposes

oat Avena

oatmeal A coarse flour made from oats

Obermayer, Fritz 1861– An Austrian physician, noted for clinical tests **O 's reagent** A 0 4 % solution of $FeCl_3$ in dilute HCl **O 's test** (for indican in urine) To equal parts of urine and chloroform a few drops of Obermeyer s reagent are added, and the mixture is shaken and left to separate The intensity of the blue color of the chloroform indicates the amount of indican

Obermüller's test (for cholesterol) The substance is melted in a test tube, and a few drops of propionic aldehyde added, on cooling, the mass becomes successively blue, green, orange and brown-red

oberphos A dry, granular superphosphate, used as a fertilizer

objective (1) The lens of the microscope nearest the object (2) The lens of a photographic camera **achromatic-** A compound lens which corrects chromatic aberration (q v) **immersion-** An objective which is dipped into a drop of cedar oil or other liquid covering the object, and thus establishes a continuous film between object and microscope **tele-** A lens of long focus, used for photographing distant objects

obsidian A volcanic glass rock used by Indians for arrow-heads, spear-heads, and other implements

occlude To take in or retain in pores, to adsorb

occluded Pertaining to a substance which is mechanically adhering to or inclosed in some other substance

occlusion The adhesion of a gas or liquid solid particles or inside a solid mass, as occlus of hydrogen on palladium occlusion of solv on precipitates or occlusion of air or liquids crystals

oceanic sediments The materials at the s bottom, which consist either of the mechani deposits from rivers or the remains of mar animals, or substances formed by chemi action on the ocean floor The deep sea depo have been classified as

red clay	2790 fathoms,	6 7 % CaC
radiolarian ooze	2894 fathoms,	4 0 % CaC
diatom ooze	1477 fathoms,	22 96 %CaC
globigerina ooze	2049 fathoms,	64 5 % CaC
ptoropod ooze	1044 fathoms,	79 2 % CaC

oceanium Hafnium

ocher Paint rock, mineral purple, yellow ear A powdered iron oxide, usually contamina with clay Used as a yellow (limonite), (hematite) or brown pigment in paints, v nishes linoleum paper-making and oilcl manufacture **antimony-** Stibiconite **b muth-** Bismite **brown-** Bogore **Indian-** **molybdic-** Molybdite **nickel-** Annaberg **plumbic-** Brown lead oxide **red-** A vari of hematite **Roman-** A deep-orange o **s thetic-** An artificial pigment, obtained precipitating ferrous sulfate with soda and l **telluric-** Tellurite **tungstic-** Tungstite **u nic-** Uraconite **yellow-** Selwynite A mixt of ferric oxide and clay

ocherous deposit The accumulation of preci tated ferric hydroxide and calcium carbon from mineral waters, due to the escape of carb dioxide

ochre Ocher

ocimene $C_{10}H_{16}$ = 136 12 *2 6*-Dimethyl-*1,6* octatriene* A terpene, d 0 799 b $_{21mm}$ from the oil of sweet basil *Ocimum basilicu* and anemone leaf *Boronia dentigeroides*

octad An element or radical that has a valer of eight Cf *octet*

octadecane* $C_{18}H_{38}$ = 254 4 A liquid hyd carbon, $d_{20°}$ 0 7668 m 30, b 306 Cf *ant mane*

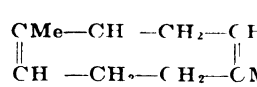
octadecanoic acid* Stearic acid

octadecanol* $C_{18}H_{38}O$ = 270 30 Octade alcohol $Me(CH_2)_{16}CH_2OH$ White leafle d 0 8124, m 59 b 210 5, occurring in sp maceti, whale and linseed oils

octadecenic acid *ε-* Petroselinic acid *θ-* Ol acid

octadecyl The radical $Me(CH_2)_{17}$— **o cohol** Octadecanol* **o ic acid** Stearic ac

octadiene C_8H_{14} = 110 11 Conylene Col less liquid, d 0 770, b 130 **dimethylcyc** $C_{10}H_{16}$ = 136 1 1 5-dimethylcyclo-octadie ($\Delta^{1,5}$) The hydrocarbon



It is a principal constituent of rubber **methyl-methylene-** Myrcene

octahedral Pertaining to a crystal with eight surfaces **o iron ore** Magnetite

octahedrite TiO_2 Anatase A native titanium dioxide, which occurs in dark blue or black tetragonal crystals

octahedron A crystal of the isometric system with eight surfaces, each having equal intercepts on all three axes, *i e*, a crystal whose 8 faces are equilateral triangles

octane* C_8H_{18} = 114 2 Dibutyl An oily hydrocarbon in petroleum A colorless liquid, d 0 706, m −56, b 125, insoluble in water **amino-** Octylamine* **chloro-*** Octylchloride ***2 7*-dimethyl-*** $C_{10}H_{22}$ = 142 17 Bisoamyl $[Me_2CH(CH_2)_2—]_2$ Colorless liquid, d 0 7264, m −52, b 100 **iodo-*** Octyliodide **o carboxylic acid** Pelargonic acid **o dicarboxylic acid** Sebacic acid **o number** The percentage of ***2 2 4*-**trimethylpentane, by volume, which must be mixed with *n*-heptane to reproduce the knocking characteristics of the gasoline being tested

octanoic acid Caprylic acid

octanol* Octyl alcohol

octanone* **2-** Mexylmethylketone **3-** Amylethylketone

octavalent Describing an element or radical having a valency of eight

octaverine A derivative of phenylisoquinoline, used as a spasmodic, said to be less toxic than papaverine

octazone N_8H_4 The hypothetical compound HN N NH N N NH N NH, known in its derivatives Cf *hydronitrogens*

octene C_8H_{16} = 112 12 Octylene, caprylene A group of alkenes, occurring in bergamot and lemon oils, as **1-**, *n-*, or Δ^1- $Me(CH_2)_5CH$ - CH_2 A colorless liquid, d 0 722, b 123 **2-**, *s-* or Δ^2- $Me(CH_2)_4CH$ CHMe **3-** or Δ^3- $Me(CH_2)_3CH$ CHEt

octet A group of eight valence electrons which is chemically inert and stable Cf *polar bond* **o theory** Lewis's theory

octin $C_9H_{19}N$ = 141 15 *2*-Methyl-*6*-methylamino-heptene-*2* Me_2C CH $(CH_2)_2CHMe$ NHMe White powder, used for convulsions

octine Octyne*

octivalent Octavalent

octo- A prefix indicating eight, as octohydro-

octodeca- A prefix indicating eighteen **o peptide** An artificial protein containing nineteen amino-acids or eighteen peptide-groups, —CO NH— Cf *polypeptide*

octodecane Octadecane

octoic acid Caprylic acid **o alcohol** Octyl alcohol

octoil Ethyl hexyl phthalate, used for vacuum pumps, q v

octointesserakaide carbonic acid $C_{16}H_{18}O_{16}$ = 466 2 An octocarboxylic acid, $(COOH)CH_2$—$(CHCOOH)_6$—CH_2COOH

octopeptide An artificial peptide consisting of nine combined amino-acids and having eight peptide groups, —CO NH—

octosan Acetylated cane sugar It has a bitter taste, and is used as a denaturant

octyl The monovalent radical, $—C_8H_{17}$ (capryl), derived from octane **o acetate** $C_{10}H_{20}O_2$ = 172 15 Caprvl acetate, $CH_3COOC_8H_{17}$ Colorless liquid, d 0 885, m −38 5, b 210, **o alcohol** $C_8H_{17}OH$ = 130 2 Octanol*, heptyl carbinol, octoic or octylic alcohol, caprylic alcohol There are several isomers **n-** 1-hydroxyoctane, $Me(CH_2)_6CH_2OH$ A colorless liquid, d 0 838, m −18, b 195 5, is soluble in water, alcohol or ether **d-sec** 2-hydroxyoctane, $Me(CH_2)_5CHOH$ Me A colorless liquid, d 0 822, b $_{20mm}$86 **1-sec-** d 0 819, m −38, b 178 **o aldehyde** $C_8H_{16}O$ = 128 2 Caprylic aldehyde, $C_7H_{15}CHO$ A colorless liquid d 0 821, insoluble in water, soluble in alcohol or ether **o amine** $C_8H_{17}NH_2$ = 129 3 *Normal* A colorless liquid, b 186, slightly soluble in water, soluble in alcohol or ether *Secondary*, Me CH NH_2 C_6H_{13} A liquid, D 12 65 **o chloride** $C_8H_{17}Cl$ = 148 64 *Normal* A liquid, d_{16}°0 8802, b 180 *Secondary* A liquid, d_{16}° 0 8708, b 175 **o formate** $HCOOC_{18}H_{17}$ = 158 2 The formic acid ester of octane A colorless liquid, d 0 893, b 198, insoluble in water, soluble in alcohol or ether **o iodide** $C_8H_{17}I$ = 240 0 *Secondary*—, $MeCHIC_6H_{13}$ A colorless, oily liquid, d 1 31, decomp 200, insoluble in water, soluble in alcohol or ether

octylene Octene

octylic acid Caprylic acid **o alcohol** Octyl alcohol

octyne* C_8H_{14} = 110 11 Octine, caprilydene, hexylacetylene, CH $C(CH_2)_5Me$ Colorless liquid, d 0 770, b 125

ocular The eyepiece of an optical instrument, as a microscope, telescope, spectroscope, polariscope **compensating-** An eyepiece that corrects the axial aberration of the objective **Huyghenian-** q v **Ramsden-** An eyepiece which increases definition and consists of two plano-convex lenses, with their convex surfaces turned toward each other **stereoscopic-** A set of two eyepieces giving a stereoscopic effect

oculin A glycerin extract of the corpus ciliariae of the eye

ocymene Ocimene

od Od-rays The luminescence of living organisms Cf *scotography*

odallin A glucoside from *Cerebera odollam* Cf *cerberin*

odor, odour The volatile portion of a substance that is perceptible by the sense of smell Six classes

1 Spicy, like anise and clove
   - a *aromatic* eugenol, thymol, menthol, apiol, carvacrol, methylsalicylate
   - b *sweet* nitrobenzene, benzaldehyde
   - c *citric* citral
2 Flowery, like geranium and heliotrope
   - a *floral* citronellol, terpineol, ionone, methylanthranilate
   - b *fragrant* coumarin, vanillin, anisaldehyde
   - c *pungent* heliotropine, styrone, musk, trinitroisobutyltoluene
3 Fruity, like bergamot and acetic ether
   - a *ethereal* ether, alcohol, acetone, ethylacetone
   - b *esteric* amylacetate, ethylvalerate, ethyl acetate
4 Resinous or balsamic, like turpentine and eucalyptus
   - a *camphoric* terpineol, camphor, eucalyptol
   - b *heavy* chloroform
5 Burnt, like tar and pyridine
   - a *empyreumatic* aniline, toluidine, benzene, xylene

b *tarry* phenol, cresol, guaiacol
c *narcotic* pulegone, pyridine
6 Foul, like hydrogen sulfide and mercaptans
a *fecal* skatole, indole
b *caprylic* valeric acid, butyric acid
c *fishy* trimethylamine, cacodyl
d *garlic* ethylsulfide, phosphine

ammoniacal- An odor resembling ammonia **aromatic-** See (1a) **balsamic-** An aromatic odor resembling balsam **burnt-** An odor resembling tar or burnt organic matter **camphorous-** An odor resembling camphor, see (4a) **caprylic-** See (6b) **citric-** See (1c) **delicate-** A slight and agreeable odor **empyreumatic-** An odor resembling burnt animal or vegetable matter **esteric-** See (5b) **ethereal-** A delicate fruity or flowery odor, see (3a) **fecal-** See (6a) **fishy-** See (6c) **floral-** See (2a) **flowery-** The odor of flowers and blossoms **fragrant-** See (2b) **foul-** See (6) **garlic-** See (6d) **heavy-** See (4b) **narcotic-** See (5c) **pungent-** A strong odor **resinous-** An odor resembling rosin or turpentine **putrefactive-** The odor of decaying animal matter **sweet-** See (1b) **spicy-** An odor resembling spices, like anise, cinnamon, cloves **tarry-** An odor resembling tar

o intensity The strength of an odor (cf *olfacty*) Various odors are used as a warning for miners, or for the detection of leaks in pipe lines or boilers The o intensity is determined (cf *olfacty*) in terms of the minimum perceptible concentration, *e g*,

musk	0 00004 mg per liter air
iodoform	0 018 mg per liter air
diamylsulfide	0 001 mg per liter air
propylmercaptan	0 006 mg per liter air
butyric acid	0 009 mg per liter air
amylisovalerate	0 012 mg per liter air
valeric acid	0 029 mg per liter air
oil of peppermint	0 03 mg per liter air
methylsalicylate	0 1 mg per liter air
acetic ether	0 68 mg per liter air
chloroform	3 3 mg per liter air

o permanency The persistence of an odor, measured by placing a definite quantity of the oil on a filterpaper, exposing it to air, and comparing its odor after certain time intervals Some of the most persistent odors, in decreasing order of permanence, are patchouli oil, sandal wood oil, cinnamon oil, cassia oil, citronella oil, origanum oil, thyme oil, neroli oil **o theory** The assumption that odor sensation is due to the combination of **chemical radicals** (*osmophoric* groups) of the **odorous substance**, with certain substances of the **nasal membrane** (*osmoceptors*), on analogy with Ehrlich's side chain theory of immunity Some of the osmophoric groups are supposed to be the radicals OH, CHO, CO, and COOH

odorator An atomizer or nebulizer for diffusing liquid perfumes

odoriferous Giving off odor, fragrant

odorimetry Olfactometry The measurement of the intensity and permanency of odors

odoriphore Osmophore

odorometer An apparatus for measuring the intensity of odors and stenches for industrial purposes

odorous Having an odor **o principle** A terpene, essential oil or balsam

oe- See *e-*

oenanthal Enanthaldehyde

oenanthe Five-finger root, water drop wort, dead tongue The dried herb of *Oenanthe crocata*, a highly-poisonous umbelliferous plant

oenanthic acid Heptoic acid

oenanthyl Enanthyl

oenidin, oenin Anthocyanins from grapes

oenotannin A tannin in wines

Oersted, Hans Christian 1777–1851 A Danish physicist who discovered electromagnetism (in 1819) by passing a current of electricity through a wire in the same plane as a suspended magnetic needle

oerstedite Hydrated zircon containing titania

oestradiol Oestrone

oestrane $C_{18}H_{30}$ = 146 2 *2*-Methyl-*1 2*-cyclopentano-perhydro-phenanthrene A tetracyclic hydrocarbon and parent-substance of sex-hormones Cf *sterols cholane*

oestrin Oestrone

oestriol $C_{18}H_{24}O_3$ = 288 2 Estriol*, theelol, trihydroxyoestrin A trihydric alcohol from pregnancy urine White needles, m 218, $[\alpha]_D$ +61°, insoluble in water Cf *cholane*

oestrol Oestriol

oestrone $C_{18}H_2O$ = 270 2 Estrone*, theelin, emmenin, thelykinine folliculin, progynon, menformon The female sex hormone obtained from ovarian follicles It is a monoatomic keto alcohol (for structure, see *cholane*) White monoclinic crystals m 250, $[\alpha]_D$ +160° insoluble in water, soluble in organic solvents It occurs also in the placenta and urine of pregnant women Cf *androsterone*

off (1) To have the wrong composition, as, to be off in carbon (2) To have a different color to the normal

official Pertaining to the United States, British or any other Pharmacopoeia **o compound** A substance listed in a pharmacopoeia **o test** An analytical method prescribed and listed in a pharmacopoeia

officinal (1) For sale in an apothecarie's shop or drug store (2) Same as official

O G Abbreviation for original gravity (see *gravity*)

Ohm, Georg Simon 1787–1854 A German physicist **O 's law** The strength or intensity of an unvarying electric current (C) is directly proportional to the electromotive force (E), and inversely proportional to the resistance (R) of the circuit Thus C = E/R

ohm A unit of electrical resistance, and the primary practical unit of electricity Ω **international-** The resistance offered to an unvarying electric current by a column of mercury at 0°C , 14 4521 gm in mass, of constant cross-section and 106 300 cm long 1 Int ohm = 1 00052 absolute ohm = 10 e m u = $\frac{1}{9} \times 10^{-11}$ e s u = 1 01367 B A ohms = 1 06292 Siemens ohm 1 B A ohm = 0 98651 Int ohm 1 Siemens ohm = 0 94080 Int ohm **legal-** (1884) 0 9972 international ohm An obsolete standard **mego-** A million ohms **micro-** A millionth of an ohm **reciprocal-** Mho, or ohm^{-1} A unit of electric conductivity (q v), the reciprocal of the resistance **true-** The resistance of a column of mercury 106 25 cm long at 0°C , of 1 sq mm cross section It is an experimentally-determined value, and equals 10^9 e m u

ohm^{-1} See reciprocal *ohm*

ohmammeter A combination ohm-meter and ampere-meter

ohmmeter An instrument for measuring electric resistance in ohms

ohmoil A mineral oil stabilized by the addition of agerite (aldol-α-naphthylamine) to prevent a decrease in electrical resistivity on prolonged heating

oiazines Orthodiazines A group of heterocyclic compounds having two nitrogens in the ortho-position in the ring, as pyridazine cinnoline Cf *muazines piazines*

-oic A suffix indicating the —COOH group, *e g*, methyloic, —COOH, ethyloic, —CH_2COOH, propyloic, —CH_2CH_2COOH

-oid A suffix indicating (1) resemblance or likeness, as alkaloid metalloid, (2) a preparation containing the concentrated active principles of a drug, as, echinacoid

oil (1) A liquid that is not miscible with water, and is generally combustible and soluble in ether Three main groups

A Fixed oils which consist of the fatty substances of vegetable and animal organisms, and contain the esters (usually glycerol esters) of fatty acids

B Volatile oils or essential oils, which consist of the odorous principles of vegetable organisms and contain terpenes, camphors, and related compounds

C Mineral oils, fuel oils and lubricants, derived from petroleum and its products, which consist of hydrocarbons

(2) Natural oil, q v **aniline-** Crude aniline **acetone-** See *acetone* **blown-** A fixed oil that has been oxidized by a current of air **boiled-** See *linseed oil* **compounded-** A mixture of essential oils resembling certain flower odors and flavors used in perfumery **crude-** Petroleum **distilled-** Essential **drying-** See *drying oil* **edible-** A fixed oil, used as food or a food accessory **essential-** The volatile or distilled oils of plants, leaves, flowers They contain aromatic hydrocarbons, aldehydes, alcohols ethers acids terpenes or camphors **ethereal fruit-** A mixture of aromatic substances resembling fruit banana, apples, etc in odor **expressed-** Fatty oil **fatty-** The nonvolatile oils of plants and animals They contain mixtures of fatty acids and their esters, (usually triglycerides), and are subdivided into three groups solid (mainly stearin), semi-solid (mainly palmitin) and liquid (mainly olein) **fish-** See *fish* oils **fixed-** Fatty **flower-** See *essential*, or *synthetic oil* **liquid-** A fatty oil that is liquid at room temperature It contains chiefly olein and can be solidified by hydrogenation **lubricating-** A mineral oil used for lubrication **mineral-** An oil, mainly hydrocarbons derived from inorganic matter, as petroleum, coal oil **natural-** A mixture of hydrocarbon oils with their oxidation products, as, crude petroleum **non-drying-** See *non-drying oil* **quintessential-** A highly-aromatic substance derived from a natural essential oil, as, anethole from anise oil, carvol from caraway oil, eugenol from clove oil **semisolid-** A fixed oil, melting at room temperature, and consisting chiefly of the triglyceride of palmitic acid (palmitin) **residual-** An oil which does not distil in refining processes **solid-** An oil or fat that is solid at room temperature and consists chiefly of stearin, the triglyceride of stearic acid **straight-cut-** A mineral oil fraction having a relatively small difference between the initial and final boiling-points **synthetic drying-** SDO An amber-colored, viscous liquid which polymerizes on drying to a hard, highly-resistant and chemically resistant, inflexible film It is used as a protective coating **volatile-** Essential oil

o of absinthe Wormwood oil **o of ajava** Ajowan oil **o of albahaca** Tolu oil **o of almond, artificial** Benzaldehyde **o of anthos** Rosemary oil **o of ants** Furfural **o of apple** Amyl valerate **o of arachis** Peanut oil **o of aspic** Spike oil **o of badian** Star *anise* oil **o of bananas** Amyl acetate **o of bay** Laurel oil **o of bay berry** Myrcia oil **o of benne** Sesame oil **o of brazil nuts** Castanhao oil **o of candle nuts** Lumbang oil **o of caoutchouc** Terpene **o of checkerberry** Gaultheria oil **o of china wood** Tung oil **o of chinese beans** Soya bean oil **o of chinese cinnamon** Cassia oil **o of cognac** Enanthic ether **o of cuscus** Vetiveria oil **o of dog-fish** Shark oil **o of dolphin** Porpoise oil **o of earth nuts** Peanut oil **o of fir** Pine oil **o of flaxseed** Linseed oil **o of Florence** Olive oil **o of garlic** Allyl sulfide **o of gingelly** Sesame oil **o of glonoin** Nitroglycerin **o of goose-foot** Chenopodium oil **o of gourd** Cucumber oil **o of ground-nuts** Peanut oil **o of gynocardia** Chaulmoogra oil **o of hoofs** Neats-foot oil **o of illicium** Star-*anise* oil **o of katchung** Peanut oil **o of lemon** Lemon oil **o of maize** Corn oil **o of melissa** Balm oil (*East Indian-*) Lemongrass oil **o of mignonette** Reseda oil **o of mirbane** Nitrobenzene **o of monarda** Horsemint oil **o of mosoi flowers** Ylangylang oil **o of mustard, artificial** Allyl isothiocyanate **o of mirbane** Neroli oil **o of orange** Orange oil **o of origanum** Wild *marjoram oil* **o of palmarosa** Turkish *geranium oil* **o of pears** Amyl acetate **o of pennyroyal** Hedeoma oil **o of pine-apple** Ethyl butyrate **o of ricinus** Castor oil **o of snake root** Asarum oil **o of sperm** Whale oil **o of tar** An empyreumatic oil obtained by distillation of pine tar **o of theobroma** Cacao butter **o of verbena** *East Indian-* Lemongrass oil *Singapore-* Citronella oil **o of vitriol** Concentrated commercial sulfuric acid **o of wintergreen** Gaultheria oil *artificial-* Methyl salicylate *synthetic-* Methyl salicylate

oil analysis The identification of an oil, and the determination of its quality, purity, and constituents It is divided into the determination of

Physical constants
- a specific gravity
- b boiling point
- c optical rotation
- d refractivity
- e congealing point or melting point
- f flash or inflammation point
- g solubility

Chemical properties
- a saponification value
- b acetylation value } ester value
- c formylation value }
- d iodine value
- e acid value

o bath A metal container, similar to a water bath, filled with oil (linseed oil, rape-seed oil) It is used to heat glass apparatus to tem-

peratures of 100–200°C **o cake** A by-product in the manufacture of oils It is a compact mass of crushed seeds or nuts, from which the oil has been expressed or extracted It contains the proteins, carbohydrates, salts, and some residual oil, and is a most valuable cattle food, also used as a basis for artificial fertilizers The percentage composition is shown in the following table (Sadtler's Industrial Organic Chemistry)

	Water	*Fat*	*Fibers*	*Ash*	*Proteins*
earth-nut cake	11 5	8 8	31 1	7 2	41 4
cottonseed cake	13 0	7 5	51 0	8 5	20 0
rape-oil cake	10 1	9 2	41 9	6 5	31 9
colza-oil cake	11 4	9 0	42 8	6 3	30 6
sesame-oil cake	10 4	10 1	38 8	9 8	31 9
beech-nut cake	11 4	8 5	49 8	5 3	24 0
linseed cake	10 6	9 8	44 6	6 5	28 5
camelina cake	9 6	0 2	50 9	7 0	23 3
poppy-oil cake	9 5	8 9	37 7	11 4	32 5
sunflower-oil cake	10 2	8 5	48 9	11 4	21 0
hempseed-oil cake	10 0	8 3	48 0	12 2	21 5
palm-nut cake	9 5	8 4	41 0	10 6	30 4
coconut cake	10 0	9 2	40 5	10 5	30 0

o cloth Linoleum A fabric (canvas) coated with a mixture of linseed oil and pigments **o gas** A group of combustible hydrocarbon gases, such as aerogene gas, Blau g , pentane g , carbo g **o seed cake** O cake **o shale** A compact sedimentary rock which yields 12–60 gallons oil per ton on distillation, and contains a considerable ash (30–50 % SiO_2, 12–67 % Fe_2O_3, 0 5–33 % CaO, 0 3–8 % MgO) It occurs in Scotland, Australia, Nevada, Colorado and Wyoming Cf *kerogen* **o stone** A fine-grained stone for sharpening knives and scalpels on which oil is used instead of water **o sugars** Oleosaccharа A trituration of 2 cc essential oil with 100 gm sugar, used medicinally and for flavoring purposes **o supply** The world-supply of o 's (1930/31) is 26,623 Mill pounds (weight) of which

vegetable o	17 424 Mill pds
animal o	9 540 Mill pds
whale o	1 474 Mill pds
fish o	211 Mill pds

o thief An apparatus for taking samples of oil from the top, center and bottom of tank cars or storage vessels

oildag See *graphite dag*

ointment Unguentum A salve or fatty preparation for external or cosmetic use **basilicon-** Resin (26 %) compounded with bees-wax, olive oil and lard **blue-** Mercury ointment **boric acid-** A mixture of 10 % boric acid, 85 % white petrolatum and 5 % paraffin, used as an antiseptic **brown-** Mother s salve A mixture of camphorated brown plaster, suet, and olive oil **camphor-** A mixture of 22 % camphor with lard and white wax, used as an anodyne and antipyretic **carbolized-** Phenol ointment **iodine-** A mixture of 4 % I and 4 % KI with glycerin and benzoinated lard **iodoform-** A mixture of 10 % iodoform with benzoinated lard **mercury-** Mercurial ointment An emulsion of 50 % finely-divided mercury in 10 % lard and 35 % suet **mercury-, diluted** Blue ointment An emulsion of 30 % mercury in 25 % lard and 45 % suet, used as an antiparasitic **phenol-** A simple ointment containing 2 % phenol, used as a wound antiseptic **simple-** Unguentum A mixture of benzoinated lard with 20 % white wax, used as an ointment base **sulfur-** A mixture of 20 % sublimed sulfur and 10 % potassium carbonate with benzoinated lard, used as an antiparasitic **zinc oxide-** A mixture of 20 % zinc oxide with white petrolatum or benzoinated lard, used as an antiseptic and astringent

oiticia oil A white, buttery fat from the nuts of the North Brazilian tree *Licania rigida*, a Rosaceae It resembles Chinese wood oil and contains coupeic acid

okonite (1) $CaH_2Si_2O_6$ A native calcium silicate in compact fibrous masses (2) An insulating material obtained by vulcanizing a mixture of ozokerite and resin with rubber and sulfur

-ol A suffix, which indicates a hydroxyl group in organic compounds, as in alcohols and phenols, (cf *-ole*)

old age theory A theory which assumes that the stability of the elements depends on the age of the earth, *e g* , in the present eon the radioactive elements are the upper limit, and in eons to come elements with higher atomic weights may make their appearance Eons ago the properties of the elements were different from those of today The hypothesis is that the trend is a slow evolution through the periodic system as a result of the gradual slowing-down of the electronic motions of the atoms and the consequent increase in mass Cf *transuranium*, extinct *elements*

-ole A suffix denoting (1) a substance which is not an alcohol but to which a name ending in -ol was originally given, as, indole (2) An aromatic ether, as, anisole, estragole

Oleaceae Olive family, a group of trees and shrubs

Olea europaea	{sweet olive {olive oil
Fraxinus ornus	manna
Fraxinus americana	white ash
Fraxinus excelsior	fraxinin
Chionanthus virginica (fringe tree)	chionanthus
Jasminum grandiflorum	jasmine oil
Nyctanthes arborthristis	nyctanthin
Ligustrum vulgare (privet)	syringin
Syringa vulgaris	syringin

oleaginous Oily or greasy

oleander Nerium A genus of subtropical, poisonous shrubs of the order Apocyanaceae which yield essential oils karabin, nerin pseudocurarine and oleandrin

oleandrin $C_{31}H_{48}O_9$ = 270 2 A glucoside from *Nerium oleander*, an Apocyanaceae Yellow amorphous powder m 70–75, insoluble in water, soluble in alcohol or ether It resembles digitoxin Cf *nerin*

oleanol $C_{29}H_{48}O$ = 412 2 Needles, m 216–230, derived from caryophyllin, sometimes used as a synonym for this compound

oleanolic acid Caryophyllin

oleastene $C_{21}H_{36}$ = 288 4 A hydrocarbon from olive oil

oleasterol $C_{20}H_{34}O$ = 290 26 A phytosterol from olive oil

oleate A compound of an alkaloid or a metal with oleic acid Used medicinally for external applications, technically, in soaps and paints

olefiant gas Ethylene

olefine One of a series of unsaturated hydrocarbons of the type, C_nH_{2n} = ethylene series They are distinguished by the suffix, -ene, as in ethylene, propylene, etc See *ethylene series* **o acid** A series of unsaturated hydrocarbon acids of the general type, $C_nH_{2n-1}COOH$ See *acrylic acids* **o alcohol** A series of unsaturated alcohols of the general type, $C_nH_{2n-1}OH$, such as, CH_2 CH OH, vinol, vinyl alcohol, CH_2 CH - CH_2 OH, propenol-3, allyl alcohol **o aldehydes** A series of unsaturated aldehydes of the general type, $C_nH_{2n-1}CHO$, as CH_2 - CHCHO, acrolein, MeCH CH CHO, crotonaldehyde **o ketones** A series of unsaturated ketones of the general type, $C_nH_{2n}CO$, as, MeCH CH CO Me, ethidene acetone, Me_2-C CH CO Me, mesityl oxide, Me_2C CH CO - CH CMe_2, phorone

oleic acid $C_{17}H_{33}COOH$ = 282 4 Oleinic acid, *9*-octadecanoic acid*, red oil, $Me(CH_2)_7$-CH CH$(CH_2)_7COOH$ An unsaturated acid Colorless needles d 0 891, m 14, b 286, insoluble in water, soluble in alcohol or ether It occurs in many (non-drying) oils, and can be hydrogenated to stearic acid (by catalysis with nickel), used in the preparation of soap **iso-** Elaidic acid (cis-oleic acid), rapinic acid **7-hydroxy-** Ricinoleic acid **o series** Acrylic acids

olein $(C_{18}H_{33}O_2)_3C_3H_5$ = 885 1 (1) Triolein, glyceryl trioleate The glyceride of oleic acid A colorless oil, m −6, insoluble in water, soluble in alcohol or ether It is the main constituent of olive and many other oils (2) Oleine A mixture of the fatty acids obtained by steam- or vacuum-distillation of the products of acid hydrolysis of fats (3) A glyceride of oleic acid, as, mono-olein, diolein

oleinic acid Oleic acid

oleite Sodium sulforicinoleate

oleo- A prefix, indicating oil **o creosote** Creosote oleate **o guaiacol** Guaiacol oleate **o oil** A yellow oil expressed from tallow, consisting of olein, used for making oleomargarine

oleomargarine (1) Margarine A butter substitute made from a mixture of hydrogenated fatty oils, colored with aniline dyes (2) The liquid fat from which margarine is made by hydrogenation

oleometer A hydrometer for oils

oleoptene See *stearoptene*

oleoresin (1) A natural combination of resinous substances and essential oils occurring in or exuding from plants, *e g*, benzoin and peru balsam (2) A pharmaceutical preparation or ethereal extract of drugs (oleoresin capsicum, cubeb, ginger) **o aspidium** Oleoresina aspidii, oleoresin of male fern A thick, olive-green liquid extracted from the male fern, which contains filicic acid, used medicinally as an anthelminthic **o capsicum** Oleoresina capsica, oleoresin of red pepper, cayenne pepper A dark brown soft mass obtained by acetone extraction of the fruit of capsicum species, used medicinally for external plasters, internally as a gastric stimulant, and as a spice for pickles **o cubeb** Oleoresina cubeba An alcohol extract from the fruits of *Piper cubeba*, insoluble in water, soluble in alcohol or ether, used medicinally as an expectorant **o ginger** Oleoresina zingiberis An acetone extract from Jamaica ginger, the rhizome of *Zingiber officinale*, used medicinally as a carminative **o lupulin** An alcohol extract from the seeds of *Humulus lupulus* used medicinally as a bitter tonic **o male fern** Oleoresin aspidium **o parsley** Oleoresina petroselini, liquid apiol A dark-green semi-liquid mass obtained by alcohol extraction of parsley seeds, insoluble in water, soluble in alcohol, chloroform or ether, used medicinally as an emmenagogue **o pepper** Oleoresina piperis An acetone extract of pepper seeds insoluble in water, soluble in alcohol or ether, used medicinally as a carminative

oleoresina The Latin for oleoresin **o aspidii** Oleoresin aspidium **o capsici** Oleoresin capsicum **o cubeba** Oleoresin cubeb **o petroselini** Oleoresin parsley **o piperis** Oleoresin pepper **o zingiberis** Oleoresin ginger

oleosacchara Oil sugar

oleostearin Beef stearin An edible solid fat obtained from certain fatty tissues of the cow

oleum (1) The Latin name for oil (2) Nordhausen acid, fuming sulfuric acid A solution of sulfur trioxide in conc (97–99 %) sulfuric acid, used as a reagent in chemical industry **o alchitri** Juniper oil **o amygdalae amarae** Bitter almond oil **o anisi** Anise oil **o anonae** Ylang-ylang oil **o anthemidis** Chamomile oil **o arachis** Peanut oil **o auranthii** Orange peel oil **o bubulum** Neatsfoot oil **o cadinum** Cade oil **o cajeputi** Cajeput oil **o calcis** A solution of calcium chloride, produced by exposing the solid to air **o cari** Caraway oil **o caryophylli** Clove oil **o cassiae** Cassia oil **o chaulmoograe** Chaulmoogra oil **o chenopodii** Chenopodium oil **o cinnamomi** Cinnamon oil **o copaibae** Copaiba oil **o coriandri** Coriander oil **o crotonis** Croton oil **o cubebae** Cubeb oil **o cupressi** Cypress oil **o eucalypti** Eucalyptus oil **o foeniculi** Fennel oil **o gaultheriae** Wintergreen oil **o gossypii seminis** Cottonseed oil **o graminis citrati** Lemongrass oil **o juniperi** Juniper berry oil **o lavendulae** Lavender flower oil **o limonis** Lemon oil **o lini** Linseed oil **o menthae piperitae** Peppermint oil **o menthae viridis** Spearmint oil **o morrhuae** Codliver oil **o myristicae** Nutmeg oil **o olivae** Olive oil **o phosphoratum** Phosphorated oil **o picis liquidae** Tar oil **o pimentae** Pimenta oil **o pini** Pine needle oil **o pini pumilionis** Pine oil **o pulegii** Pennyroyal oil **o ricini** Castor oil **o rosae** Rose oil **o rosemarini** Rosemary oil **o sabinae** Savine oil **o santali** Sandalwood oil **o sassafras** Sassafras oil **o sesami** Sesame oil **o sinapis volatile** Mustard oil **o terebinthinae** Turpentine oil **o terbinthinae rectificatum** Turpentine oil, rectified **o theobromatis** Cacao butter **o thymi** Thyme oil **o tiglii** Croton oil

oleyl The radical, $C_{17}H_{33}CO$—, derived from oleic acid **o alcohol** *9 10*-Octadecanol

olfactometry Odorimetry

olfacty A unit for expressing intensity of odor q v It is the threshold value, or the minimum perceptible concentration expressed in grams per cc, this multiplied by $6\,06 \times 10^{21}/M$, where M is the molecular weight, gives the number of molecules per cc, thus (cf odor intensity)

ionone	16×10^5 molecules per cc
ethyldisulfide	15×10^6 molecules per cc
skatole	16×10^6 molecules per cc
vanillin	20×10^6 molecules per cc
valeric acid	47×10^6 molecules per cc

olibanoresin $C_{14}H_{22}O$ = 206 1 A neutral resin obtained from olibanum

olibanum Frankincense, gum thus A gum resin obtained from incisions in the trees of various *Boswellia carteri* and other species from South Arabia and Somaliland Yellow tears or reddish fragments, used in perfumery, as incense, and medicinally as an emmenagogue Cf *boswellic acid* **o oil** An essential oil from olibanum containing pinene, dipentene, and phellandrene, d 0 895, insoluble in water, soluble in alcohol or ether Used in medicine for bronchial affections

-olid A suffix indicating a lactone, q v

olifiant gas Ethylene

oligoclase A silica mineral (q v) of the feldspar group

oligodynamic Small but powerful, the inhibition of fermentation or growth of bacteria due to the presence of metals (e g , iron containers)

oligodynamics The bactericidal action of metals, as Ag and Cu

oligonite $FeMn(CO_3)$ Native iron and manganese carbonate

oligosaccharide A carbohydrate that, in contrast to polysaccharides, yields on hydrolysis a small number of monosaccharose molecules, hence the di- tri-, and tetra-saccharides

olistomerism Describing reactions in which the same substrates yield the same final products, but via different intermediate stages

olive The fruit of *Olea europaea*, an Oleaceae, used as food and in the manufacture of olive oil **o oil** A fixed oil expressed from the olive, a pale yellow liquid, d 0 91, m −6, insoluble in water, soluble in alcohol, ether, or chloroform It contains olein and palmitin, impure grades are adulterated with other oils (cotton-seed oil, peanut oil) Used as a food, in pharmaceutical preparations, and in the manufacture of castile soap **o kernel oil** A yellow oil extracted or expressed from the kernel of olives, d 0 918 insoluble in water soluble in alcohol or ether used as food a lubricant and in soap manufacture

olivenite $CuO\,As_2O_3\,H_2O$ Wood copper A native copper arsenate

olivine (1) See *olivines* (2) $(Mg,Fe)_2SiO_4$ Peridot chrysolite An orthorhombic magnesium and iron silicate, usually green crystals in many rocks, used as a gem and refractory Cf *chrysolite, peridotite* **o diabase** A diabase containing olivine crystals

olivines A group of silica minerals, (q v) generally the sulfates of divalent metals

Olsen's testing machine An apparatus for determining the tensile strength of cement It consists of an arrangement of levers and two heavy forceps, between which the specimen is placed and torn apart

oly The scum on molten metal

omal Trichlorphenol

omega The Greek letter ω or Ω, see under O

-on A little-used suffix indicating a ketonic grouping (cf *-one*)

onanthol Enanthol

-one A suffix indicating (1) A ketone (2) A substance related to the starches and sugars (3) An alkone, C_nH_{2n-4} Cf *hydrocarbons*

-onic A suffix which usually denotes an acid produced by oxidation of an aldehydic group in an organic compound

Ongstrem The phonetic spelling of Ångstrom (q v)

onion The edible bulb of *Allium cepa*, a Liliaceae, used as a condiment, food, and for the preparation of a syrup **o oil** A light yellow oil of penetrating odor which consists mainly of allylpropyldisulfide, d 1 04, insoluble in water soluble in alcohol or ether, used in flavoring

onium compounds A group of organic compounds of the type RXH_y, which are isologs of ammonium and contain the element X in its highest positive valency, as

X is pentavalent

ammonium	$-NH_4$
phosphonium	$R\,PH_4$
arsonium	$R\,AsH_4$
stibonium	$R\,SbH_4$

X is tetravalent

oxonium	$R\,OH_3$
sulfonium	$R\,SH_3$
selenonium	$R\,SeH_3$
stannonium	$R\,SnH_3$

X is trivalent

iodonium	$R\,IH_2$

They may also be considered as addition compounds, cf *oxonium, carbonium, stibonium, -anium, -ylium*

onocerin $C_{30}H_{42}(OH)_2$ = 388 3 Onocol A secondary bivalent alcohol, m 232, from the root of *Ononis spinosa*, a Leguminosae

onocol Onocerin

onofrite A native sulfo-selenide of mercury, Hg(S, Se)

ononetin $C_{23}H_{22}O_6$ = 394 20 A split-product of ononin

ononid $C_{18}H_{22}O_8$ = 366 2 A neutral principle from the root of *Ononis spinosa*, a leguminous plant of Europe A dark yellow powder soluble in water or alcohol

ononin $C_{28}H_{26}O_{11}$ = 502 2 A glucoside from the root of *Ononis spinosa*, a Leguminosae of Europe A white crystalline powder, m 201 slightly soluble in hot water or alcohol

onychograph A sphygmograph for recording variations in the blood pressure of the finger tips

onyx Calcareous sinter A variety of agate (chalcedony quartz) in white and black alternate strata, used as a gem **o marble** Mexican onyx A calcite resembling onyx, and used as an ornamental stone

oöcyanin A blue coloring matter from certain birds' eggs

oölite Peastone A compact limestone

ooze (1) The soft and slimy mud at the bottom of lakes and oceans Cf *oceanic sediment diatoms* (2) The slow exudation of a liquid

opacifier A substance which, when added to a transparent substance, makes it opaque, as zirconium oxide, stannic hydroxy or arsenic and antimony compounds when added to glass

opacity The property of being impervious to light rays, not transparent or translucent Cf *opaque*

opal $SiO_2\,xH_2O$ An amorphous form of silica containing a variable amount of water Vitre-

ous, transparent to translucent masses of various colors, which reflect the light after refracting it so that a play of rainbow colors is produced There are several varieties, to which specific names have been given **agate-** An opal of agate-like structure **cacholong-** An opaque porcelain-white, blue-white or pale yellow variety **fire-** A red to yellow o with fire-like reflections **girasol-** A blue-white variety, translucent, with red reflections in strong light **harlequin-** A variety having a variegated play of colors on a reddish background, resembling a fire opal **hydrophan-** A white, opaque opal, that becomes transparent when immersed in water **jasp-** A variety containing iron **lechosos-** A variety with deep green flashes of colors **moss-** A variety with moss-like inclusions of manganese oxide **pearl-** An opaque, bluish-white, lustrous variety **semi-** A native form of silica **tabasheer-** An amorphous, opal-like silica deposited in the joints of bamboo It resembles hydrophane Cf *hyalite, isopyre* **wood-** A wood that has become silicified into opal

o flashes The bright colors of an opal in certain positions, due to the refraction of light by thin films or layers **o glass** A milky white glass **o jasper** A form of silica resembling jasper

opalescence Milky irridescent reflected light from a mineral or from a solution due in the latter case to the presence of a small quantity of precipitate

opalescent (1) Resembling an opal in appearance (2) A milky turbidity

opalescin An albumin obtained from milk, it forms opalescent solutions

opalized wood A petrified wood resembling opal

opaque (1) Non-transparent, (2) non-translucent Cf *opacity*

open chain Non-cyclic A carbon-chain that does not close and form a cyclic compound **o hearth** A reverberatory furnace used in the manufacture of steel, in which hot producer gases are passed over a large open crucible containing iron ore, scrap iron and pig-iron (open-hearth process)

operation A chemical manipulation dissolving, precipitating, distilling, evaporating, filtering, weighing, titrating, etc

ophelic acid $C_{13}H_{20}O_{10}$ = 336 16 An amorphous substance in *Swertia (Ophelia) chirata*, a Gentianaceae, and split-product of chiratin, soluble in water, alcohol, or ether

ophiolite Serpentine containing calcium carbonate

ophiotoxin $C_{17}H_{26}O_{10}$ = 390 2 A poison from the venom of the East Indian cobra (*Naja tripudians*)

ophioxylin $C_{16}H_{13}O_6$ = 301 1 A glucoside from the root of *Ophioxylon serpentinum*, an Apocynaceae of India Yellow crystals, m 72, used medicinally as an anthelmintic and for snake bites

ophthalin Vitamin A

ophthalmo- A prefix derived from the Greek, indicating "eye"

ophthalmoleukoscope An instrument for testing color sensitiveness by means of polarized colors

ophthalmoscope An instrument for the examination of the interior of the eye

opianic acid $C_{10}H_{10}O_5$ = 210 13 5 6-dimethoxy-phthalaldehydic acid, formyl dimethoxy benzoic acid, $C_6H_2(OMe)_2CHO(COOH)$ Colorless fine prisms, m 150, soluble in hot water, alcohol, or ether

opianine (1) Narcotine (2) $C_{66}H_{72}O_{12}N_8$ = 938 7 An alkaloid from opium, which resembles morphine in its physiological effect

opianyl Meconine

opiate A narcotic drug

opium The air-dried milky juice of the unripe capsules of the poppy *Papaver somniferum* Brown masses, containing inert materials and a number of alkaloids (see below) Used medicinally as a narcotic, and for the preparation of opium alkaloids See also *kusamba, meconine, meconic acid, chandoo yenshee, mudat* **o alkaloids** A series of alkaloids obtained from or related to opium

(a)	Morphine group	morphine
		homochelidonine
		chelidonine
(b)	Codeine group	papaverine
		codeine
		laudanosine
		narcotine
		hydrocotarnine
		sanguinarine
		thebaine
		laudanine
		hydrastine
(c)	Protopine group	protopine
		cryptopine
(d)	Miscellaneous group	chelerythrine
		oxydimorphine
		thebenine
		thebaicine

Cf *pantopone, holopon, anarcotine, cotarnine, codamine, gnoscopine, lanthopine, narceine, opianine, rheadine, tritopine, xanthaline* **o vinegar** Black drops A preparation containing 10 % opium

opopanax An oleoresin or the dried juice obtained from the roots of *Pastinaca opopanax*, an Umbelliferae of the Orient, used in incense and perfumes, and medicinally as an antispasmodic **o oil** An oil, d 0 87–0 90, b 250–300 from *Commiphora katof* a Burseraceae Cf *balm of Gilead*

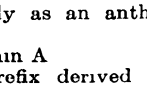
opsogens See *opsonigenous substances*

opsonic index The ratio of the opsonins present in the blood of a diseased person to those of a normal individual

opsonigenous substances Aggressins, opsogens, Substances produced by the metabolism of bacteria Cf *endotoxin*

opsonin A substance of the blood-serum that renders invading microorganisms more susceptible to digestion by the phagocytes of the body **common-** Normal- **immune-** Specific opsonins Substances formed in the blood by the stimulation of bacterial poisons (opsonigenous substances) **normal-** The protective substances of the blood present normally and in uninfected individuals **specific-** Immune-

opsonization The increase of opsonins, or the retention of the opsonic index, produced by the inoculation of opsonins into an organism

opsopyrrol $C_7H_{11}N$ = 111 1 Ethyl-methyl-pyrrol  A decomposition product of hematin Cf *porphin ring*

optical (1) Pertaining to sight, as optical pyrometers (2) Pertaining to light, as optical

activity **o activity** O rotation, opticity The power of a substance or solution to rotate the plane of vibration of polarised light to the left or to the right Optical activity is characteristic of compounds containing an asymmetric atom, usually a carbon atom It is measured by means of the polariscope (q v) and is used in quantitative analysis, as, sugar analysis Cf *enantiomorph, birotation, mutarotation* **o bench** A rail arranged with holders to carry a number of lenses and mirrors, whose distances apart may be varied and measured on a scale and whose optical axes are in the same straight line Used for optical experiments **o density** The quantity, log I_0/I, where I_0 is the intensity of an incident ray falling on a transparent or translucent medium (e g , solution) and I the intensity of the transmitted ray Cf *extinction coefficient* **o isomerism** See *isomery* **o pyrometer** An instrument for measuring high temperatures by optical means, such as, the Mesure p (using polarized light) or the Wanner p (measuring intensity of light) A filament is heated by an electrical current of known strength until the glow exactly matches that of the furnace The instrument is calibrated in terms of known temperatures

500°C	red, just visible
700°C	dull red
900°C	cherry red
1100°C	orange
1200°C	white
1500°C	dazzling white

Cf *leucoscope* **o rotation** O activity **o telephone** A telephone, the diaphragm of the receiver of which is connected to a mirror, so that its vibrations are magnified as bands of light of varying size

opticity Optical activity A term used in the sugar and brewing industries

optics Photics A branch of physics that deals with visible radiations (light), their reflection, refraction, absorption, and transmission Cf *dioptrics*

optimal The most favorable, suitable, or best factor or condition

optimum Best, most favorable **o temperature** The temperature at which enzymes show the greatest activity, or at which the growth of bacteria is most rapid

optochine $C_{21}H_{28}O_2N_2$ = 340 35 Numoquin, ethylhydrocupreine A quinine alkaloid (q v), levo-rotatory, soluble in alcohol or ether, used as a specific for pneumococcic invasions **o hydrochloride** Colorless crystals, soluble in water, used medicinally

optophone An instrument for enabling ordinary print to be read by the blind It consists of a selenium cell, telephone and illuminating device, which transform the light waves into sound waves Cf *photophone*

orange (1) A color intermediate between red and yellow (2) The edible yellow fruit of *Citrus* species, Rutaceae, q v (3) A group of pH indicators changing from purple or magenta (acid) to orange (alkaline) **bitter-** Curacao- or Seville- The fruit of *Citrus bigaradia* **sweet-** China- or Portugal- The fruit of *Citrus aurantium*

o blossom odor See *indole* **o dye** Tropeolin **o flower oil.** Neroli oil **o oil** An essential oil expressed from the peel or rind of oranges A pale yellow liquid, d 0 84–0 85, insoluble in water, soluble in alcohol, ether, or chloroform It is used in flavoring extracts for the household and soda-water fountains, in perfumes, and in pharmaceutical preparations *bitter-*, Curacao orange oil, Seville orange oil The oil expressed from the rinds of orange peels of *Aurantii amara* (*Citrus vulgaris*) *sweet-* The oil expressed from sweet orange peels, *Aurantii dulcis* (*Citrus bigaradia*) **o mineral** Sandix **o peel** The dried rinds from oranges *bitter-* From the fruits of *Citrus vulgaris* = Seville orange, curacao orange *sweet-* From the fruits of *Citrus bigaradia* = Portugal orange, China orange Used in medicine and pharmacy, for flavoring, and in confectionery **o peel oil** Orange oil **o pigments** See *antimony orange, chrome orange*, etc **o red** Sandix **o root** Hydrastis

orangite A bright, orange-yellow, hydrated silicate of thorium, a variety of thorite

orbit The path of an electron moving round the atomic nucleus, according to the dynamic concept of the atom (Bohr's model) Orbits correspond with the shells of the static atom (Lewis' model), in which the electrons are assumed to oscillate around certain positions at different distances from the nucleus The o are described by the quantum numbers n_k, where n indicates the magnitude or *size* corresponding with different energy levels, q v (Cf orbital *state*)

K level	n is 1
L level	2
M level	3
N level	4

k indicates the *form* or quantum state, which may be either circular, (k = n), or elliptical (k less than n), thus giving rise to different spectrum lines

s orbit	k is 1
p orbit	2
d orbit	3
f orbit	4

The different quantum states for the first four energy levels are, thus (Cf *Stoner quanta*)

ENERGY LEVEL	*Normal ORBITS* ($k = n$)			
K	1_1			
L	2_1	2_2		
M	3_1	3_2	3_3	
N	4_1	4_2	4_3	4_4
	(s)	(p)	(d)	(f)

Excited ORBITS (k less than n)

Cf *state* (of electrons)

orbital Pertaining to motion around a center **o state** See *state*

orcein $C_{28}H_{24}O_7N_2$ = 500 2 A coloring matter of orchil, synthesized from orcin and ammonia Brownish-red crystals, insoluble in water, soluble in alcohol, acetone, acetic acid (red color) and alkalis (violet color) Used in microscope stains, as an antiseptic, and as a reagent

Orchidaceae Orchis family, a group of perennial herbs, some of them epiphytic, usually with showy flowers Some of the species yielding drugs are

Cypripedium species	lady's slipper root
Orchis species	salep
Vanilla planifolia	vanilla
Corallorrhiza odontorrhiza	coral root

orchil Archil, orseille extract, cudbear, persio A thick reddish-purple liquid of slight ammoniacal odor It is a coloring material obtained from various lichens by treatment with ammonia and exposure to air, and contains orcein, orcin, and litmus, used as a coloring material for pharmaceutical preparations Cf *orcein*

orchitin A sterilized testicular extract

orcin Orcinol

orcinaurine Homofluorescein A red dyestuff with a green fluorescence, obtained by the action of chloroform and alkali on orcinol, used as a fluorescent indicator for pH values of 6 5 to 8 0

orcinol $C_6H_3(CH_3)(OH)_2$ = 124 0 Orcin, *5*-methyl-*1 3*-benzenediol*, 3 5-dihydroxytoluene 3 5-dihydroxy-1-methyl-benzene, dimethylresorcinol A white crystalline powder, which becomes red with age, d 1 289, m 107, b 287, soluble in water, alcohol, or ether It occurs in various lichen species and forms orcein with ammonia Used medicinally as an antiseptic, as a reagent for pentoses, and as a stain Its isomer is homopyrocatechol **methyl-** Xylorcinol **trinitro-** See *trinitroorcinol*

ordeal bark (1) The poisonous bark of various trees, used by savages in trial by ordeal (2) Casca bark Cf *Erythrophloeum* **o bean** The poisonous fruits of various trees used in ordeals by natives, *e g physostigma, tanghinia*

order A grade in scientific classification, particularly applied to zoology **o of compounds** (1) An arrangement of types of compounds according to their complexity

1st order = binary compounds, as, NaCl, CaO, H_2O

2nd order = tertiary compounds, as, Na_2SO_4, $Al(OH)_3$

3rd order = addition or co-ordinate compounds, as, $MgSO_4 6H_2O$ or $NiSO_4 6NH_3$ (2) See *Mulliken s classification* **o of reaction** See *reaction* **o of terms** In mixed fertilizers the o is nitrogen first, phosphoric acid second and potassium third

ordinal Pertaining to a sequence or order **o number** Rydberg's number, indicating position in the periodic system, now superseded by the atomic number **o test** A reaction which determines qualitatively the elements of an organic compound, so that they may be placed in the "order" of Mulliken's classification (q v)

ordinary Common **o iron** Cast iron **o ray** The ray of light normally reflected or refracted in a polariscope, as opposed to the extraordinary ray, which is not

ordinate The y-coordinate in the Cartesian system of graphical representation Cf *coordinates*

ordination number Atomic number

ore A natural mineral or mineral mixture from which useful substances are obtained, usually containing metallic compounds See *iron, sulfur, radioactive, minerals*, etc They are found mixed with the earthy matter (matrix or gangue) in which they have been deposited The principal ores are oxides, carbonates silicates, sulfides, arsenides, antimonides, and halides Cf *flotation, roasting, smelting* **mock-** Sphalerite **pay-** An o that can be worked with profit **positive-** q v **possible-** q v **raw-** An o in its natural, but crushed untreated condition

o band A zone of rock rich in ores, a vein **o bed** A zone of ore between sedimentary deposits **o body** A solid and continuous mass of ore **o. crusher** A machine for disintegrating ores preparatory to the stamp mill or rollers **o dressing** The refining or cleaning of ore by mechanical means, as, jigging, cobbing, etc **o mill** A concentrator or stamp mill **o pocket** An isolated occurrence of a rich deposit of ore **o separator** A mechanical device in which ore is separated from rock, as a cradle or jigging machine

oreodaphene A hydrocarbon oil of California laurel, *Umbellularia californica*, a Lauraceae, a colorless oil, d 0 894, b 175

oreodaphnol An alcohol in the oil of California laurel A colorless liquid of pungent odor, b 210

oreoselin $C_{14}H_{12}O_4$ = 244 2 A crystalline split-product obtained from athamantin by hydrolysis with alkali

oreoselon $C_{14}H_{10}O_3$ = 226 2 An amorphous powder obtained by hydrolysis of athamanthin with sulfuric acid

oreston Positron A positive electron (from *Orestes*, brother of *Electra*)

orexin $C_{14}H_{11}N_3$ = 207 1 Phenzoline, cedrarine, phenyldihydroquinazoline $C_6H_4{<}^{CH_2N}_{CHN}C_6H_4$ A derivative of quinoline, a white, odorless powder or lustrous crystals, soluble in hot water Used medicinally as a stomachic in cases of loss of appetite **o tannate** The tannate of orexin A yellowish powder, insoluble in water, soluble in acids, used medicinally as a stomachic stimulant

Orfila, Mathieu Joseph Bonaventura 1787–1853 A Spanish-born Frenchman, the founder of toxicology

organ Any tissue or part of an organism which has a distinct function

organellæ Substances within organic cells composed of lipoids

organic Pertaining to an organ or a substance derived from an organism (See *organic compound*) **o acid** A compound containing one or more carboxyl radicals, —COOH According to the number of such radicals present there are

monobasic acids, R COOH

$C_nH_{2n+1}COOH$ = acetic acid series
$C_nH_{2n-1}COOH$ = acrylic acid series
$C_nH_{2n-3}COOH$ = acetylene acid series
$C_nH_{2n-7}COOH$ = aromatic acid series

dibasic acids, $R(COOH)_2$

$C_nH_{2n}(COOH)_2$ = oxalic acid series
$C_nH_{2n-8}(COOH)_2$ = phthalic acid series

tribasic acids, $R(COOH)_3$
tetrabasic acids, $R(COOH)_4$
pentabasic acids, $R(COOH)_5$, etc
The presence of other radicals is indicated by the descriptive terms monohydroxy, dihydroxy, monoamino, diamino, monoketo, diketo, etc **o analysis** The qualitative or quantitative determination of organic compounds See *analysis* **o bases** The amines and alkaloids **o chemistry** That branch of chemistry

dealing with carbon compounds or the nonpolar compounds It was assumed that compounds of organisms were the product of a vital force and could not be made artificially, but, with the synthesis of many of these compounds, this division into organic and inorganic chemistry has become invalid, and of convenience only The elements entering into organic combinations in order of importance, are C, H, O, N, Cl Br, I, F, S, P, Al, etc Organic compounds vary greatly in stability The largest ring compound is civetone with seventeen atoms in a ring Rubrene bromide has the highest melting point (500°C) Maltosazone is the largest molecule which has been synthesized so far Cf *inorganic chemistry* o **combustion** See *combustion* o **compound** A nonpolar compound, which generally consists of carbon and hydrogen, with or without oxygen, nitrogen, or other elements, except those in which carbon plays no important part (*e g* , carbonates) Many may be classified into

A Aliphatic compounds, which consist of a chain of carbon-atoms Hydrocarbons, alcohols, aliphatic acids and aldehydes, carbohydrates, peptides

B Aromatic compounds, which consist of a ring of carbon atoms with or without other atoms in the ring Benzene, naphthalene, anthracene derivatives, and terpenes, glucosides, alkaloids, dyes

A more appropriate classification of organic compounds is by CLASS and TYPE

The CLASS (or *Division* of Beilstein, cf *stem nucleus*) is based on the fundamental structure of the compound, thus

	CHAIN COMPOUND	RING COMPOUND
HOMOGENEOUS	Class 1	Class 3
HETEROGENEOUS	Class 2	Class 4

Class 1—A homogeneous chain compound, in which the carbon atoms form a continuous or a branched chain (hydrocarbons, ketones, acids, alcohols) Division I of Beilstein

Class 2—A heterogeneous chain compound, in which the carbon atoms are interrupted by the atoms of other elements (ethers, esters, peptides) No division in Beilstein

Class 3—A homogeneous ring compound, in which the carbon atoms form a closed ring (benzene, phenols, anilines) Division II of Beilstein

Class 4—A heterogeneous ring compound, in which the atoms of the ring consist of atoms other than of carbon Division III of Beilstein

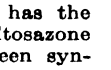
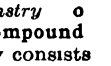
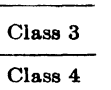
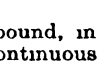
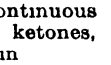
Each class is subdivided into compounds containing

a—no double or triple bonds (saturated)

b—one or more double bonds

The TYPE (or *Functionary Class* of Beilstein, cf *functioning group*) is based on the presence of one or more radicals to which are due the characteristic reactions of the compound, as, —OH, alcohols or phenols, —NH_2, amines, etc

o **radicals** A group of atoms that normally passes unchanged from one molecule of a carbon compound to another, *e g* ,

acetamido	CH_3CONH—
acetimido	$CH_3C(NH)$—
acetonyl	CH_3COCH_2—
acetoxy	CH_3COO—
acetyl	CH_3CO—
alanyl	$NH_2CHMeCO$—
allyl	CH_2CHCH_2—
amino, amido	NH_2—
amyl	$Me(CH_2)_4$—
anilino	PhNH—
anisal	$MeOC_6H_4CH$=
anisoyl	$MeOC_6H_4CO$—
anisyl	$MeOC_6H_4$—
anthranilo	
azo	—N N—
azoxy	
benzal	PhCH=
benzamido	PhCONH—
benzimido	PhC(NH)—
benzoxy	PhCOO—
benzoyl	PhCO—
benzyl	$PhCH_2$—
butenyl, Δ^1-	$MeCH_2CH$ CH—
butoxy	$MeCH_2CH_2CH_2O$—
butyl	$MeCH_2CH_2CH_2$—
butyl secondary	EtCHMe—
butyl tertiary	Me_3C—
carbamido	NH_2CONH—
carbamyl	NH_2CO—
carbony(l)	OC=
carbonyldioxy	—O CO O—
carboxyl	—COOH
cinnamal	PhCH CHCH=
cinnamyl	PhCH CHCO—
crotonyl	MeCH CHCO—
cyano	—C N
ethoxy	EtO—
ethyl	Et or CH_3CH_2—
ethylene	$—CH_2CH_2$—
formyl	H CO—
fural	
furyl	
glyceryl	
glycolyl	$HOCH_2CO$—
glycyl	NH_2CH_2CO—
glyoxyl	H CO CO—
guanido	NH_2CNH NH—
guanyl	$NH_2C(NH)$—
hydrazino	NH_2NH—
hydrazo	—NH NH—
hydrazono	NH_2N=
hydroxamino	HONH—
hydroxy	HO—
imido, imino	HN=
isonitro	=NOOH
isonitroso	=NOH
isothiocyano	—N C S
malonyl	$—CO\ CH_2\ CO$—
mercapto	—SH
methenyl	≡CH
methoxy	MeO—
methylene	$=CH_2$
methyl	Me or $—CH_3$
naphthoxy	$C_{10}H_7O$—
naphthyl	$C_{10}H_7$—
nitramino	O_2N NH—
nitrate	O_2NO—

nitro	—NO_2
nitrite	—ONO
nitroso	—NO
oxalyl	—OC CO—
oxamido	NH_2 OC CO NH—
phenacyl	$PhCOCH_2$—
phenethyl	$PhOCH_2CH_2$—
phenoxy	PhO—
phenyl	Ph or C_6H_5—
phthalyl	$C_6H_4\langle^{CO—}_{CO—}$
propenyl	MeCH CH—
propionyl	$MeCH_2CO$—
propoxy	$MeCH_2CH_2O$—
propyl	$MeCH_2CH_2$—
protyl	—CH_2C CH
salicyl	HO C_6H_4—
salicylal	HO C_6H_4CH=
salicylyl	HO C_6H_4 CO—
styryl	Ph CH CH—
styrenyl	Ph CH CH_2—
succinyl	—CO CH_2 CH_2 CO—
sulfamino	—NH SO_2 OH
sulfamyl	—SO_2 NH_2
sulfino	—SO_2H
sulfo	—SO_2 OH or —SO_3H
sulfonamido	—SO_2 NH—
sulfonyl	—SO_2—
thiocarbonyl	=C S
thionyl, sulfinyl	=S O
toluino	MeC_6H_4 NH—
toluyl, alpha-	Ph CH_2 CO—
toluyl, ortho-	Me C_6H_4 CO—

See the "*Decennial Index*" of the Chemical Society (London) and of the American Chemical Society (Washington, D C), also *radicals, structure symbols, formula* and *notation* o **symbols** Structure symbols

organism A living complex, undergoing dynamic changes, which exists in a colloidal protoplasmic medium (*protoplasm*, q v) and is organized in a definite pattern (histology, anatomy) with a definite function (physiology) Any animal, plant, or human body Cf *life*

organoferric Same as masked iron, (see *masked*)

organoleptic Referring to sensation, as, smell and taste

organolite An organic base-exchange material (*e g*, certain phenol-formaldehyde plastics) They may be classified according to the C-metal linkage (1) Ordinary covalent, *e g*, Et-Zn-Et (2) Coordinate, *e g*, $K_4Fe(CN)_6$ (3) Ionic, *e g*, Ca—C ≡C (4) Metallic, *e g*, NbC

organomagnesium halides See *Grignard reagent*

organometallic. Pertaining to the carbon-metal linkage o **compounds** A class of compounds of the type R—M, where R is an alkyl or aryl radical and M a metal, *e g*, $PbEt_4$, tetra-ethyl lead, R—Mg—X, alkyl-magnesium-halide Cf *Grignard reagent, organolite*

organosol A sol in which the essential constituent is organic

organotherapeutic extracts Pharmaceutical preparations obtained from various animal organs, and used in the treatment of certain diseases
brain—see *cerebrine*
liver—see *hepar siccatum*
lungs—see *pulmones sicci*
kidney—see *renes siccum*
spleen—see *lien siccus*
bronchial gland—see *glandula bronchis*
ciliary body—see *corpus ciliare*
mammary glands—see *mammae siccatae*
ovaries—see *corpus luteum*
See *leucocytes, pituitary, ductless glands, testes, prostate, fibrogen, eukinase, cardiassin*

organotherapy The treatment of disease by dried organs or organ extracts

organotropic A substance that acts specifically on an organism, and not on parasites (see *parasitotropic*)

organzine Warp silk The reeled-off fibers from a number of silk cocoons

oriental agate A translucent variety of agate, used as a gem o **amethyst** A native purple alumina o. **cashew-nut** Semecarpus o. **emerald** A green variety of corundum o **garnet** Garnet o **hyacinth** A rose-colored corundum o **powder** A mixture of gamboge with potassium nitrate, used as an explosive in day-fireworks o **ruby** A red variety of corundum o **sapphire** A blue variety of corundum o **sweet gum** Styrax o **topaz** A yellow variety of corundum

orientation (1) The structural arrangement of substituting radicals in a compound, compared in relation to each other and to the parent compound (2) The determination of crystal structure (3) The direction or position assumed by a molecule, due to an electric charge, adsorption, or other cause Cf *zone*

origanum oil (1) Spanish hop oil An essential oil from *Origanum vulgare* (Labiatae), wild majoram, used in veterinary medicine and in liniments (The oil of *O marjorana* is marjoram oil) (2) An essential oil distilled from *Thymus vulgaris*, and sold in France as o oil

orizabin Jalapin

orlean Annatto

Orlovius flask A conical flask with a ground stopper and glass delivery-tubing, similar to a wash-bottle, used for drawing and handling of blood samples for bacteriological work under sterile conditions

ormolu Mosaic gold An alloy of equal parts of copper and zinc, used for cheap jewelry, chandeliers and ornaments

ormosine An alkaloid from the seeds of *Ormosia dasycarpa*, a leguminous plant of Brazil Colorless crystals, m 80, soluble in alcohol or chloroform, used as a hypnotic and sedative

ormosinine $C_{20}H_{33}N_3$ = 315 28 An isomer of ormosine, m 205

ornithine $C_5H_{12}O_2N_2$ = 132 11 *α δ*-Diamino-valerianic acid, *2 5*-diaminopentanoic acid* An amino acid (q v) from the excrements of birds It yields arginine with urea N^{α}-guanyl- Isoarginine N^{δ}-guanyl- Arginine

oroberol $C_{18}H_{14}O_8$ = 358 1 A chromogen from the leaves of *Orobus tuberosus*, optically inactive, m 290

orobol $C_{15}H_{10}O_6$ = 286 1 A dihydroxy-tetrahydroflavone, m 270 5, obtained by hydrolysis of oroboside

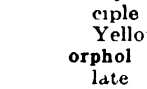
oroboside A glucoside from the leaves of *Orobus tuberosus* (*Lathyrus*), a Leguminosae, yielding orobol White crystals, m 250

orogenic The large-scale tangential compressive forces responsible for geological fractures

oronite A low-boiling gasoline used in special plant for generating a substitute gas for bunsen burners

oropon A tryptic puering material

orotic acid $C_5H_6N_2O_5$ = 154 05 Iso-uracyl carboxylic acid An acid isolated from milk



White crystals, m 259

oroxylin $C_{19}H_{14}O_6$ = 338 11 A bitter principle from the bark of *Oroxylon indicum* Yellow crystals, m 225, soluble in water

orphol Trade name for bismuth beta-naphtholate

orpiment As_2S_3 Kings' yellow, auripigment A native arsenic trisulfide Lemon-yellow crystalline masses, used as a pigment and depilatory **red-** Arsenic disulfide

Orr white Lithopone

orris The dried rhizome of Florentine iris, *Iris florentina* A creamy-white powder, insoluble in water, used in dentifrices and perfumery (sachet powders) **o oil** An essential oil distilled from the rhizome of *Iris florentina* A yellowish, semi-solid oil, m 44, insoluble in water, soluble in alcohol or ether, used in cosmetics and perfumery It contains myristic and oleic acids and esters

Orsat apparatus A portable gas analysis apparatus, consisting of a measuring buret and three or four gas-absorption pipets connected by a manifold

orseille, orselle Orchil

orseillic acid, orseillinic acid Orsellic acid

orsellic acid $C_8H_8O_4$ = 168 0 Orsellinic acid orseillic acid, 2 4-dihydroxy-6-methylbenzoic acid, $MeC_6H_2(OH)_2COOH$ A split-product of lecanoric acid and a constituent of many lichens, m 176 (decomp), hydrolysed to orcinol, q v

orsellin, orseillin Roccellin A constituent of orchil

orsellinic acid Orsellic acid

orsudan Sodium 3-methyl-r-acetylaminophenylarsenate A yellow crystalline powder, used medicinally as an antisyphilitic and antiprotozoan

Orth stain Lithium carmine An aqueous solution of 1 % lithium carbonate and 3 % carmine, with or without picric acid, used as nuclear stain

orthanilic acid $C_6H_7O_3NS$ = 173 17 o-Aminobenzenesulfonic acid, o-anilinesulfonic acid An isomer of sulfanilic acid, used in organic synthesis

orthene *o*-Dichlorobenzene

orthin $C_6H_3(OH)COOH(NH\,NH_2)$ = 168 1 4-hydroxy-2-hydrazybenzoic acid, o-hydrazine-p-hydroxybenzoic acid Colorless crystals, sometimes used medicinally as an antipyretic

orthite Allanite

ortho- (1) A prefix indicating the neighboring or 1 2-position Cf *meta-*, *para-* (2) A prefix indicating the most hydroxylated acid known in either the free state or as salts or esters, *e g*, *orthosilicic acid* Cf *meta-*, *pyro-* (3) A prefix indicating an odd rotational quantum number, as, ortho-hydrogen **o -acid** (1) An organic acid having the carboxyl group in the ortho-position (2) An organic acid containing one additional molecule of water in chemical combination, as $H\,COOH$ = formic acid, and $HC(OH)_3$ = orthoformic acid (3) An inorganic acid containing the normal amount of water, as $P_2O_5 + 3H_2O = 2H_3PO_4$, orthophosphoric acid, $SiO_2 + 2H_2O = H_4SiO_4$ orthosilicic acid **o -compounds** A benzene derivative containing two substitution radicals in neighboring positions See *meta-*, *para-* The ortho- or 1 2-compound is to be found under the name of the compound **o -hydrogen** See *hydrogen molecule* **o -nitrogen** See *nitrogen molecule* **o position** See *o compounds*

orthoacetic acid $CH_3C(OH)_3$, known only in its esters, as $MeC(OEt)_3$, *1 1 1*-triethoxyethane* or ethylorthoacetate A colorless liquid, d 0 8847, b 142

orthoaluminic acid The tautomer of aluminum hydroxide $Al(OH)_3 \rightleftharpoons H_3AlO_3$ It forms aluminates, M_3AlO_3

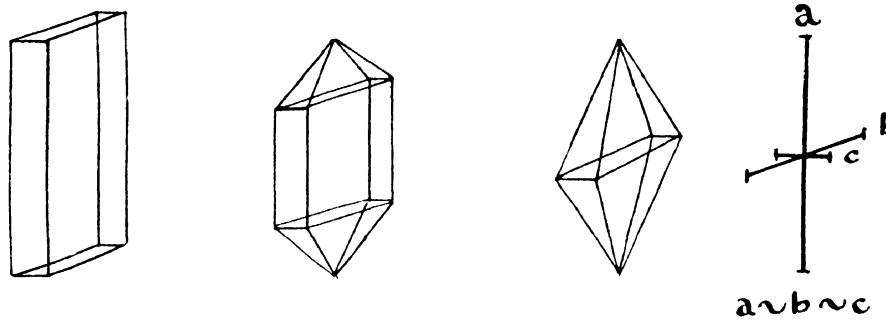
orthocarbonic acid Tetrahydroxymethane, $C(OH)_4$ (or $H_2O\,H_2CO_3$), esters of which are known, as, $C(OEt)_4$, tetraethoxymethane* or tetraethylorthocarbonate A colorless liquid d 0 9197, b 159

orthoclase $KAlSi_3O_8$ Sunstone A native potassium aluminum silicate, potash feldspar It is the commonest silicate and a constituent of many rocks It crystallizes in the monoclinic system as white, grey, or pink crystals and often contains sodium

orthoform $C_6H_3(COOCH_3)OH(NH_2)$ = 167 1 Methyl-3-amido-4-hydroxybenzoate Methyl ester of m-amido-p-hydroxybenzoic acid A white, odorless and tasteless powder, m 142 slightly soluble in water, soluble in alcohol, used as an antiseptic and local anesthetic **new-** Orthoform **old-** The methyl ester of p-amido-m-hydroxybenzoic acid, or methyl-4-amido-3-hydroxybenzoate White crystals, m 118 , used as an antiseptic

orthoformic acid CH_4O_3 The hypothetical acid, $HC(OH)_3$, known in the form of its esters, *e g* $HC(OEt)_3$, triethoxymethane* A colorless liquid, d 0 897, m −76 1, b 145 9

orthohydrogen See *hydrogen molecule*



Orthorhombic system

orthokinetic coagulation Coagulation due to the motion of particles in one direction, cf *perikinetic*

orthonitric acid The hypothetical compound H_3NO_4 or $O{=}N(OH)_3$

orthophosphate A salt of the type M_3PO_4

orthophosphoric acid See *phosphoric acid*

orthorhombic A crystal with three unequal long axes intersecting at right angles **o system** A prismatic, rhombic, or trimetric system Crystal forms derived from a prism having three axes of different lengths intersecting at right angles (see figures)

orthosilicate A salt containing the tetravalent $\equiv SiO_4$ radical

orthosilicic acid Silicic acid

orthosiphonin A glucoside from the leaves of Java tea, *Orthosiphon stamineus*, a Labiatae, used as a diuretic

orthotaxy Crystalline structure in the form of long parallel columns

ortizon $CO(NH_2)_2, H_2O_2 = 94\ 07$ Perhydrate Hyperol A compound of hydrogen peroxide and urea Colorless and odorless crystals or sticks, used as an antiseptic, reagent and bactericide to replace hydrogen peroxide

ornithine Ornithine

oryza Rice

oryzamin (1) An extract from rice bran (2) An antineuritic vitamin from rice bran or yeast, identical with vitamin B_1, q v

Os The symbol for osmium

osage orange The bark of *Maclura aurantiaca*, a shrub of North America It contains a yellow coloring material and tannin, used in the textile and leather industries **o o wood** The wood of *Maclura pomiferum* Used as a yellow coloring matter and fustic substitute

osamine A compound derived from sugars by replacing an OH group by NH_2, *e g*, glucosamine

Osann, Gottfried Wilhelm 1797–1866 A German physical chemist noted for his work in platinum metals, he named ruthenium

osazone Diphenyl hydrazone A characteristic crystalline insoluble compound obtained by heating a polyhydroxy aldehyde or ketone (aldose or ketose sugar) with phenylhydrazine hydrochloride, and sodium acetate in boiling water, *e g*, $R\,CO + H_2NNH\,Ph = R\,C\,N\text{-}NHPh + H_2O$, yellow or orange in color **diacetyl-** A compound obtained by heating diacetone with phenylhydrazine

$$\begin{array}{l} Me\,C = N\,NHPh \\ \quad\vert \\ Me\,C = N\,NHPh \end{array}$$

o test The microscopical examination and melting-point determination of the osazone precipitates, to distinguish different sugars

Osborne, Thomas, Burr 1859–1935 An American biochemist, noted for his work on vegetable proteins

oscillation A vibratory to-and-fro motion

oscillograph Oscillometer A device for recording the wave forms of high-frequency currents The most recent apparatus use a cathode ray discharge, and have an efficiency of 10^{-5} sec

oscillometer Oscillograph

oscine The *3 7*-anhydride of *6 7*-dihydroxytropine

-ose A suffix indicating (1) a carbohydrate, (2) the substance produced by enzymic digestion of a protein, *e g*, an albumose

oshaic acid An acid obtained from the osha root, the root of *Ligusticum filicinum*, an Umbelliferae, used medicinally as an expectorant

Oslo unit A vitamin unit, q v

osmate A salt containing the divalent OsO_4^{--} radical

osmic A compound of tetravalent osmium **o acid** $OsO_4 = 254\ 9$ Osmic anhydride, osmium tetroxide, perosmic anhydride, perosmic oxide Yellowish crystals or colorless powder, of pungent and irritating odor, d 4 91, m 20, b 100, soluble in water, alcohol or ether Its solutions deposit black osmic hydroxide Used as a reagent for adrenalin and indican, in microscopy for staining, in photography, and for Welsbach mantles **o acid anhydride** Osmic acid **o anhydride** Osmic acid **o hydroxide** $Os(OH)_4 = 258\ 9$ A black precipitate from osmic acid solutions

osmicate To stain a microscopic section with osmic acid

osmics Pertaining to odors, the study of odors

osmiridium Iridosmine An alloy of osmium (17–50 %) and iridium (77 %), with various other platinum metals It occurs native in platinum deposits, and remains as an insoluble black powder on treating platinum ores with aqua regia Used in the preparation of osmium and its salts, and for penpoints

osmium Os = 190 2 A hard, bluish-white metallic element of the platinum group, d 22 48, m 2700, insoluble in water or acids Atomic number 76 Used as a catalyst, in platinum alloys, for incandescent lamps, and pen-points Osmium has valencies of 2, 3, 4, and 8

+2 osmous, Os^{++}	green
+4 osmic, Os^{++++}	dark orange
+6 osmyl, OsO_4^{--}	orange

It is found native as an alloy, nevyanskite **o chlorides** $OsCl_2$, osmium dichloride, $OsCl_3$, osmium trichloride, $OsCl_4$, osmium tetrachloride **o dichloride** $OsCl_2 = 261\ 8$ Dark green hygroscopic needles, slightly soluble in water, alcohol or ether, soluble in sodium chloride solutions **o dioxide** $OsO_2 = 222\ 9$ A copper-red powder, d 7 9, insoluble in water or acids **o disulfide** $OsS_2 = 255\ 0$ A bright yellow powder, slightly soluble in water or alkalis **o fluoride** $OsF_8 = 342\ 9$ Colorless crystals, m 34 5, b 47 3 The **hexafluoride**, $OsCl_6$, b 203, is also known **o hydroxide** (1) $Os(OH)_3$ A dark orange, insoluble powder (2) $Os(OH)_4$ A black, insoluble powder **o monoxide** $OsO = 206\ 9$ A black powder, insoluble in water soluble in acids **o oxides** OsO, osmium monoxide, Os_2O_3, osmium sesquioxide, OsO_2, osmium dioxide, OsO_4, osmium tetroxide or osmic acid **o potassium chloride** $K_2OsCl_6 = 481\ 7$ Dark red octahedral crystals, soluble in water or alcohol **o sesquioxide** $Os_2O_3 = 429\ 8$ A black powder, insoluble in water or acids **o sodium chloride** $Na_2OsCl_6 = 449\ 5$ Red rhombic prisms, soluble in water or alcohol **o sulfides** OsS_2, osmium disulfide, OsS_4, osmium tetrasulfide **o trichloride** $OsCl_3 = 297\ 3$ A brown crystalline powder, slightly soluble in water, soluble in alkalis or acids **o tetrachloride** $OsCl_4 = 332\ 7$ Reddish-yellow needles, slightly soluble in water, soluble in alkalis or acids **o tetroxide** Osmic acid **o tetra-**

sulfide. OsS_4 = 319.2. A brownish-black powder, insoluble in water, soluble in nitric acid.

osmoceptor. An atomic grouping which holds an osmophore. Cf. *odor theory.*

osmometer. A device for measuring osmotic pressure.

Osmond iron. A high-grade iron made in an Osmund furnace (q.v.).

osmondite. A solid solution of iron carbide in alpha-iron.

osmophore. Odoriphore, aromatophore. Those atomic linkages in a molecule which cause odor; as, —COOR, —CHO, =CO, —CH_2OH, also sulfides, cacodyls, terpenes and pinenes. Cf. *odor theory, chromophore, pharmacophore.*

osmoscope. An osmometer, or device to demonstrate osmosis.

osmose. Osmosis.

osmosis. The diffusion of a liquid or gas through a porous wall or semi-permeable membrane, due to the attraction between a solvent and solute (*e.g.*, water and sugar) which creates the osmotic pressure, q.v.

osmotaxis. The movement of cells due to osmotic pressure.

osmotic. Pertaining to osmosis. **o. cell.** A container or compartment separated from another compartment by a semi-permeable membrane or a finely porous wall. **o. equivalent.** The ratio between the amount of water and the amount of solute passing in opposite directions through a semi-permeable membrane. **o. pressure.** The force exerted by dissolved substances on a semi-permeable membrane which separates a solution from the pure solvent; the force resulting from the molecular attraction between solute and solvent. It is proportional (a) to the number of molecules in solution (concentration), and therefore to (b) the lowering of the freezing point, and (c) the raising of the boiling point.

According to Van't Hoff's theory (q.v.) dissolved substances obey the gas-laws; hence the o. p. equals the gas pressure which the solute would exert if all the solvent were removed and the solute left in the same space in the condition of an ideal gas. Hence o. p. is defined as: the hydrostatic pressure which is necessary to bring the solution into equilibrium with the pure solvent, when the two are separated by a semi-permeable membrane.

Many phenomena are due to o.p., such as the rise of sap in the stems of plants, the tremendous expanding force of roots, which may split rocks, and the absorption and secretion of food and waste materials.

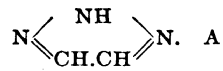
Osmund furnace. A high forge or primitive blast furnace. **O. iron.** Osmond iron.

osone. A ketonaldehyde formed from an osazone by hydrolysis with concentrated hydrochloric acid. By its reduction a ketone-alcohol is formed, so that the original aldose can be changed to an isomeric ketose by means of osazone and osone transformations.

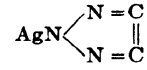
$$X.CH(OH).CHO \rightarrow X.C(:N.NHPh).CH:N.HNPh.$$
$$X.CO.CH_2OH \leftarrow X.CO.CH:O$$

osotetrazones. The derivatives of *v*-tetrazines, q.v.

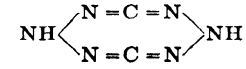
osotriazole. $C_2H_3N_3$ = 69.1. 1.2.3-triazole, pyrro(a,a')diazole. The heterocyclic compound



A colorless crystal or liquid, m.22, b.204, soluble in alcohol. **n-phenyl-**, 1-phenylosotriazole. A colorless liquid, b.224. **n-phenyl-c-amido-c-methyl-**, or 2-phenyl-5-amino-4-methylosotriazole. Colorless crystals, m.83. **o. silver.** AgC_2N_3 = 173.91.



osotriazoleazimide. $C_2N_6H_2$ = 110.08.



osram. An alloy of osmium and tungsten (wolfram). **o. lamp.** An incandescent lamp having a tungsten filament coated with osmium (trade name).

ossalin. Adeps ossium. A grayish fat with the odor of tallow, obtained from ox bone marrow; used in ointments.

ossein. Collagen. The albumenoid material (bone-marrow) which remains after treating bones with dilute hydrochloric acid; it is hydrolyzed by boiling water to glue and gelatin.

ossification. Formation of, or conversion into bone; *e.g.*, as of cartilage.

osso-albumin. A protein obtained from ossein.

ossomucin. The substance which holds bone tissue together.

osteolite. An impure apatite or calcium phosphate.

ostranite. Zircon.

ostrole. $C_{15}H_{16}O_3$ = 244.1. A substance like coumarin, m.84 from masterwort, the rhizome of *Imperatoria ostruthium.*

ostruthin. $C_{18}H_{20}O_3$ = 284.2. A crystalline substance from the root of masterwort, *Imperatoria ostruthium*, an Umbelliferae. Yellow crystals, m.119, insoluble in water, soluble in alcohol or ether. Cf. *imperatorin.*

Wilhelm Ostwald.

Ostwald, Wilhelm. 1853–1932. A German chemist and research worker in theoretical and

physical chemistry, noted for his theories of solution and color **O equation** The degree of ionisation of a solution of an electrolyte at a given concentration is $\Lambda/(1a + 1c)$, where Λ is the electrical conductivity of the solution at that concentration, and 1a and 1c are the mobilities of the anion and cation, respectively, at infinite dilution **O law** Dilution law In a solution of an electrolyte the square of the number of moles ionized divided by the number of moles not ionized varies directly with the dilution The law is derived by the application of the law of mass action to an ionization equilibrium It must be modified to be applicable to strong electrotypes (cf *activity, Rudolfi's equation*) **O rule** In the formation of a substance which can exist in more than one modification, the least stable is formed first, and changes ultimately into the more stable modification **O theory of indicators** The color changes of indicators are due to their existence as weak acids or bases which follow the usual laws of ionization, one ionic radical having a different color from the undissociated molecule

osyritin $C_{27}H_{30}O_{17}$ = 626 23 A bright-yellow glucoside from *Osyris abyssinica*, the Cape sumach or bergbas, a Santalaceae of South Africa, used for tanning

otavite A native cadmium carbonate, usually hydrated

otoba butter Otoba wax **o wax** Otoba butter, American nutmeg butter, American mace butter The fat expressed from the fruits of *Myristica otoba* or *M fragrans*, m 38, containing olein, myristicin and otobite, and having a nutmeg-like odor Cf *mace, myristica*

otobite A white crystalline solid, m 133, from otoba wax

otolith Ear-stone A concretion of calcium carbonate formed in the ear

otto of roses Attar of roses

ouabain $C_{30}H_{46}O_{12}\,9H_2O$ = 761 4 Uabain Crystallized strophantin, strophantin G A glucoside from the seeds of *Acocanthera venenata* (*ouabaio*) and *Strophanthus gratus* Colorless quadratic crystals, soluble in hot water, or alcohol, slightly soluble in ether or chloroform Used medicinally as a digitalis substitute, constituent of Zulu arrow poison Cf *acocantherin, wabain*

ounce A measure of weight in the English system

apothecaries- 1 ap oz = ℥ = 1 troy ounce = $\frac{1}{12}$ pound = 8 drams (ʒ) = 24 scruples (℈) = 480 grains (gr) 1 ap oz = **31 1034 grams**

avoirdupois- 1 av oz = $\frac{1}{16}$ pound = 7 2916 drams = 18 229 pennyweights (dwt) = 21 875 scruples = 437 5 grains 1 av oz = **28 3502 grams** = 28,350 2 milligrams = 138 449 carats = 142 045 metric carats

fluid- 1 fl oz = 16 pound = 0 25 gill = 480 minims (♏) = **28 3966 c c** = the volume of one av oz distilled water at 62°F

troy- 1 oz t = 20 pennyweights = 480 grains = **31 10348 grams** = 1 09712 av oz

-ous A suffix indicating the lower valence of an element or radical, as, ferrous, sulfurous

outcrop A mineral deposit, vein, or lode that comes to the surface of the earth

output The total amount produced in a given time

ouvarovite Uvarovite

ovalbumin An albumin from egg-white

ovarian substance The dried and powdered entire ovaries of the hog, without preservative or diluent A yellowish powder of peculiar odor, slightly soluble in water, used medicinally Cf *corpus luteum*

ovarin The dried and powdered ovaries of the cow, used medicinally

oven A compartment in which substances are heated, dried, roasted, baked, or annealed Cf *furnace*

overcooled Supercooled

overgrowth The growth of a crystal over the surface of a crystal of a different, but usually isomorphous, substance

overheating Superheating (1) To heat excessively (2) To raise the temperature of a liquid above its boiling point

overpotential The difference in volts between the back-potential of an electrode and that of a saturated calomel electrode at the same temperature and partial pressure, immediately after the cessation of electrolysis Cf *overvoltage undervoltage*

oversaturated Supersaturated Describing a solution that contains more solute than is normal for saturation at a given temperature

Overton coefficient Distribution coefficient

overvoltage (1) Overpotential (2) Super-tension The excess voltage above the normal reversible electrode potential of a metal electrode required to decompose the solution or cause deposition from the solution on the electrode It depends on the nature and surface of the metal, and is important in electrolytic reactions and for the graded electrolytic deposition of metals from a mixed solution Cf *polarization*

ovo An egg **o flavin** Vitamin B_2 **o globulin** A protein of egg-white precipitated by dialysis **o keratin** The membranous lining of birds' and shark's eggs

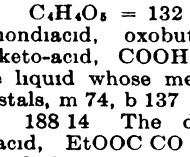
Ovoca classifier A mechanical separator for ores, which consists of a double-screw continuous conveyor

ovoflavin Vitamin B_2

ovomucin A water-insoluble globulin from egg-white

Owen process A flotation process, in which the ores are agitated in water containing 2 oz eucalyptus oil per ton

oxa- A prefix indicating an oxygen bridge, as, oxabicyclononane



oxacid Oxyacid

oxalacetic acid $C_4H_4O_5$ = 132 03 Oxysuccinic acid, butanondiacid, oxobutanedioic acid* A dibasic keto-acid, COOH CO CH_2 COOH An unstable liquid whose methyl ester forms colorless crystals, m 74, b 137 **o [ethyl] ester** $C_8H_{12}O_5$ = 188 14 The diethyl ester of oxalacetic acid, EtOOC CO CH_2 COOEt A colorless liquid, b 131 It can decompose in three different ways

(a) acid decomposition, forming CH_3OH, $(CO\text{-}OH)_2$, and CH_3COOH

(b) ketone decomposition, forming CO_2 and CH_3CO COOH

(c) carbon monoxide decomposition, forming CO and EtOOC CH_2 COOEt

oxalaldehyde Glyoxal

oxalamide Oxamide

oxalamidine $C_2H_6N_4$ = 86 2 Diamidine $NH_2C(NH)—C(NH)NH_2$

oxalanilide Oxanilide

oxalate A salt of oxalic acid, or a compound containing the divalent $(COO)_2^{--}$ radical The metallic oxalates, except those of the alkalis and magnesium, are insoluble in water **acid-** Bioxalate **bi-** or acid-, A salt containing the monovalent $HC_2O_4^-$ radical **neutral-** Oxalate

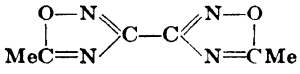
oxaldehyde Glyoxal

oxaldiamidoxime $C_2H_6O_2N_4$ = 118 2 $NH_2C(NOH)—C(NOH)NH_2$ Colorless crystals, m 196

oxaldihydroxamic acid $C_2H_4O_4N_2$ = 120 1 $HOC(NOH)—C(NOH)OH$ Colorless crystals, m 165

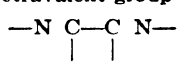
oxaldiimidedihydrazide $C_2H_8N_6$ = 116 4 Carbohydrazidine $H_2N\,NH\,C(NH)—C(NH)\text{-}NH\,NH_2$

oxalenbisazoxymethenyl The heterocyclic compound,



Colorless crystals, m 165

oxalene The tetravalent group



oxalethyline Diethyloxamide

oxalhydrazide $C_2H_6O_2N_4$ = 118 1 $NH_2NH\text{-}CO\,CO\,NH\,NH_2$

oxalic acid $C_2H_2O_4\,2H_2O$ = 126 1 Ethandioic acid, dicarboxylic acid, ethanedioic acid* A dibasic or dicarboxylic acid, HOOC COOH Colorless, monoclinic, poisonous crystals, d 1 65, m 99, soluble in water, alcohol, or ether It occurs in many plants, or is prepared by passing CO into concentrated NaOH, or by heating cellulose (sawdust) with NaOH Used extensively as a reagent (for standard solutions), in the synthesis of many compounds, as a precipitant in purifying glycerin, in the dye and textile industries, as an ink eraser, in bleaching, and in photography **diethyl-** Diethoxalic acid **chlor-** C_2HO_4Cl = 127 5

o. acid series A group of dibasic organic acids containing two carboxyl radicals, $(CO\text{-}OH)_2$, and having the general formula, $C_nH_{2n-2}O_4$ or $(CH_2)_n(COOH)_2$

oxalic acid	HOOC COOH
malonic acid	$HOOC\,CH_2\,COOH$
succinic acid	$HOOC\,(CH_2)_2\,COOH$
glutaric acid	$HOOC\,(CH_2)_3\,COOH$
adipic acid	$HOOC\,(CH_2)_4\,COOH$
pimelic acid	$HOOC\,(CH_2)_5\,COOH$
suberic acid	$HOOC\,(CH_2)_6\,COOH$
azelaic acid	$HOOC\,(CH_2)_7\,COOH$
sebacic acid	$HOOC\,(CH_2)_8\,COOH$
brassic acid	$HOOC\,(CH_2)_9\,COOH$
brassylic acid	$HOOC\,(CH_2)_{11}\,COOH$
roccellic acid	$HOOC\,(CH_2)_{14}\,COOH$

o aldehyde Oxaldehyde **o dianilide** Oxanilide **o monoamide** Oxamic acid **o monoanilide** Oxanilic acid **o monoureide** Oxaluric acid

oxalium Potassium bioxalate

oxalmethylin $C_4H_8N_2O_2$ = 116 08 Dimethyloxamide, $(CONHMe)_2$ White crystals, m 210

oxaluramide $C_3H_5O_3N_3$ = 131 1 Oxalan, oxamic acid ureide $NH_2CO\,NH\,CO\,CO\,NH_2$, m exceeds 310

oxaluric acid $C_3H_4O_4N_2$ = 132 07 Oxalic monoureide, carbamyl oxamic acid, $NH_2\,CO\,NH\,CO\,COOH$

oxalyl The divalent —CO CO— radical **o chloride** COCl COCl = 126 93 Ethandioyl chloride* A colorless liquid, m −12, b 64 decomp by water, or alcohol, slightly soluble in ether **o diacetophenone** $PhCOCH_2CO\,COCH_2COPh$ = 294 2 Colorless crystals, m 180 **o urea** Parabanic acid

oxamethane $C_4H_7O_3N$ = 117 09 Acetyloxamide, ethyloxamate, $C_2O_2NH_2(C_2H_5O)$ The ethyl ether of oxamic acid Colorless crystals, m 115, soluble in alcohol

oxamic acid $C_2H_3O_3N$ = 89 1 Oxaminic acid, oxalic acid monoamide The acid, $HOOC\text{-}CONH_2$ Colorless crystals, decomp 210 slightly soluble in water or alcohol **carbamyl-** Oxaluric acid **phenyl-** Oxanilic acid

oxamide $C_2H_4O_2N_2$ = 88 1 Ethanediamide* The amide of oxalic acid, $(CONH_2)_2$ A colorless crystalline powder, d 1 476, decomp 417, insoluble in water, alcohol, or ether

oxamides A group of compounds derived from oxamide by replacing the hydrogen atoms by alkyl or aryl radicals
$(CONHMe)_2$, dimethyl oxamide, m 210
$(CONMe_2)_2$, tetramethyl oxamide, m 80

oxamidine Amidoxime

oxamido The monovalent radical, $H_2NCO\text{-}CONH—$

oxaminic acid Oxamic acid

oxamonitrile $C_2H_2ON_2$ = 70 1 Carbamyl cyanide $NH_2\,CO\,CN$

oxamyl The monovalent radical, $H_2NCO\,CO—$

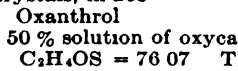
oxane Ethylene oxide

oxanilic acid $C_8H_7O_3N$ = 165 1 Phenyloxamic acid, oxalic acid monoanilide $HOOC\text{-}CONHPh$ Colorless rhombic crystals, m 149, slightly soluble in hot water, alcohol or ether, used in organic synthesis

oxanilide $C_{14}H_{12}O_2N_2$ = 240 2 $(CONHPh)_2$ Colorless scales, m 245, insoluble in water or ether, soluble in hot alcohol, used in organic synthesis

oxanthranol $C_{14}H_{10}O_2$ = 210 1 Anthrahydroquinone, $C_6H_4(COH)_2C_6H_4$ Yellow needles, m 180

oxanthrol $C_{14}H_{10}O_2$ = 210 1 5-keto-10-hydroxy-anthracene, 10-hydroxyanthrone, 5-keto-anthrol, oxanthrone

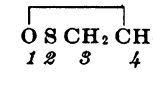


Colorless crystals, m 205

oxanthrone Oxanthrol

oxaphor A 50 % solution of oxycamphor

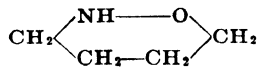
oxathietane C_2H_4OS = 76 07 The heterocyclic compound



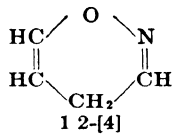
oxatollic acid $C_{16}H_{16}O_3$ = 256 2 Dibenzylglycollic acid $HOC(CH_2Ph)_2COOH$ or $CH_2\text{-}Ph\,C(OH)COOH\,CH_2Ph$ Colorless crystals, m 156

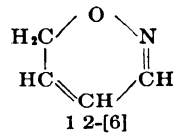
oxatyl Carboxyl.

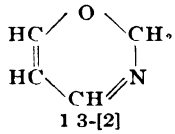
oxazidine C_4H_9ON = 87 1 A heterocyclic compound formed by the anhydrides of gamma-aldehydes and gamma ketone-acids

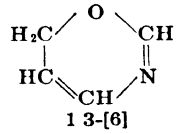


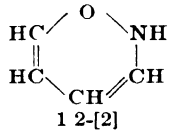
oxazine C_4H_5ON = 83 1 A series of thirteen heterocyclic compounds, *e g*,


1 2-[4]


1 2-[6]


1 3-[2]


1 3-[6]

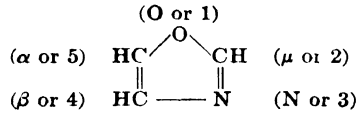

1 2-[2]

The remaining compounds are designated as 1 2-[3], 1 2-[5], 1 3-[3], 1 3-[4], 1 3-[5], 1 4-[2], 1 4-[4], and 1 4-[3], where the first and second numeral indicates the position of O and N, and the numeral in brackets the position of the additional H (as CH_2 or NH group)

1 2-[2] is *1 2*-isoxazine
1 3-[3] is *1 3*-isoxazine
1 3-[4]- is also called pentoxazol
1 4-[2]- is also called paroxazine
1 4-[4] is *1 4*-isoxazine
Cf *thiazine, benzoxazine, benzoparoxazine*

naphth- Phenoxazine **par-** 1 4-[2]-Oxazine **phen-** Phenoxazine

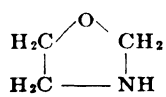
oxazole C_3H_3ON = 69 1 Furo(b)-monazole The heterocyclic compound,

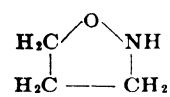


dihydro- Oxazoline **tetrahydro-** Oxazolidine **triphenyl-** Benzilam

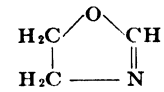
oxazoles A series of derivatives of oxazole, formed by (a) a condensation of halogen derivatives of ketones with an acid amide R—CH C(OH)Br + R'C(NH)OH, (b) by passing HCl into a mixture of aromatic aldehydes and their cyanhydrins R—CHO + R'—CH(OH)CN, (c) by the action of H_2SO_4 on nitriles and benzoin

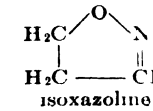
oxazolidine C_3H_7ON = 73 1 The heterocyclic compound,


oxazolidine


isoxazolidine

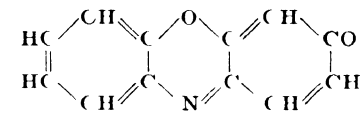
oxazoline C_3H_5ON = 71 1 The heterocyclic compounds,


oxazoline


isoxazoline

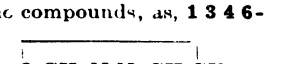
μ-amido- Ethylene urea **μ-amido-α-methylene** Propylene urea

oxazone $C_{12}H_7O_3N$ = 197 1 The heterocyclic compound,

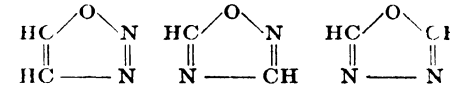


9-hydroxy- Resorufin

oxdiazine C_3H_4ON = 84 047 A series of heterocyclic compounds, as, **1 3 4 6-**


O CH N N CH CH_2
1 2 3 4 5 6

oxdiazole $C_2H_2ON_2$ = 70 1 A series of heterocyclic compounds

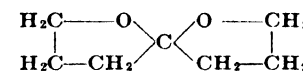


1 2 3-	1 2 4-	1 3 4-
furo(ab)diazole or diazoanhydride	furo(ab')diazole or azoxime	furo(bb')diazole or oxybiazole

1 2 5- Furazan (furo(aa')diazole)

oxethyl Ethylol The monovalent CH_2OH-CH_2— radical, (cf ethoxy-, OC_2H_5)

oxetone $C_7H_{12}O_2$ = 128 1 The heterocyclic spiro-compound,



Oxford process The separation of nickel from copper by means of sodium sulfide Cf *Mond process*

oxgall The bile obtained from the gall bladder of oxen Used in the textile industry, and in lithography and engraving

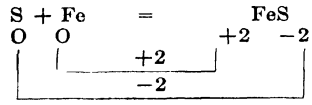
oxid Oxide

oxidase An oxidizing enzyme in animal and vegetable tissues

oxidation The act of oxidizing, or the increase of the valency of an element, cf *hydroxylation* Originally, combining with oxygen, later the term indicated also a combination with halogens or other electronegative elements More recently it has a broader meaning an augmentation of the valence number of an ion or atom as the result of the loss of negative charges as electrons, thereby, making it more electropositive See *electronation* It is the correlative term of reduction Cf *redox oxido-reduction* For examples of oxidation see *nitrogen, heavy metals, chromium* **o process** A process or reaction which increases the proportion of oxygen or acid-forming elements or radicals in a compound **o reaction** Electronation reaction A reaction in which the valence number of an element changes Every oxidation must be accompanied by a correlative reduction or decrease in the valence number

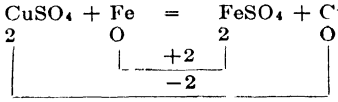
of some other element Some types of oxidation-reduction reactions are

Combination reactions



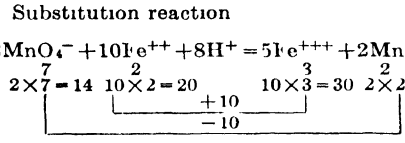
The iron is oxidized 2 steps (lost 2 electrons), the sulfur is reduced 2 steps (gained 2 electrons)

Displacement reaction



The copper is reduced (gained 2 electrons), the iron is oxidized (lost 2 electrons), the sulfate is neither oxidized nor reduced

Substitution reaction



which in its molecular form is

$$2KMnO_4 + 10FeSO_4 + 8H_2SO_4 = 5Fe_2(SO_4)_3 + 2MnSO_4 + K_2SO_4 + 8H_2O$$

Two atoms of manganese are each reduced from 7 to 2, a total gain of 10 electrons

Ten atoms of ferrous are oxidized to ferric, a total loss of 10 electrons

The potassium and sulfate remain unchanged

o -reduction indicators. See *indicators* **o value** A constant of oils The degree of oxidation (in terms of gms of I per 100 gms of sample) which occurs when a solution of a fat in carbon tetrachloride is oxidised by potassium dichromate in glacial acetic acid

oxide A binary compound of oxygen generally with a metal, M_2O (basic), or non-metal, NO_x (acid) Cf *ethers, anhydrides* **acid-** The oxygen compounds of non-metals, as SO_2, SO_3, P_2O_3, P_2O_5, etc They give the oxyacids with water **basic-** The oxygen compounds of metals, as Na_2O, K_2O, CaO, MgO, Al_2O_3 They give the bases with water **amphoteric-** The oxygen compounds of the heavy metals, such as ZnO, Fe_2O_3, etc They may form either weak acids or weak bases **hydrous-** An amorphous colloidal substance, which is neither a definite hydroxide nor a definite crystalline hydrate **inert-** Those oxygen compounds which form neither acid nor basic compounds, as CO, N_2O **neutral-** Hydrogen oxide, or water **per-** A binary compound containing the peroxide group —O O—, as H_2O_2, BaO_2 Peroxides yield hydrogen peroxides with acids, and should not be confused with dioxides, many of which do not Thus, NO_2 is a dioxide, not a peroxide **primary-** q v **prot-** The o with the fewest oxygen atoms of a series of oxides **sub-** An o lower than the commonest of a series

oxidimetry Analytical methods in which an oxidizing agent is employed for the titration of substances

oxidize To unite with oxygen or to increase the proportion of electronegative elements or radicals

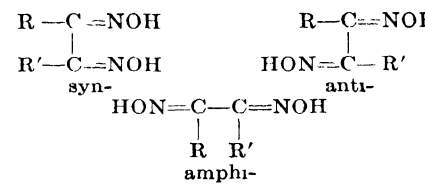
oxidizer An oxidizing agent (q v) generally in the solid state, as, $NaNO_3$ or NH_4NO_3 in explosives

oxidizing The act of oxidation or electronation **o agent** A substance that (a) yields oxygen readily, (b) removes hydrogen from a compound, or (c) attracts negative electrons The common oxidizing agents are O_2, O_3, Cl_2, Br_2, $KMnO_4$, $K_2Cr_2O_7$, $KClO_3$, HNO_3, H_2O_2 **o flame** The outer zone of a flame containing an excess of air (The inner cone contains more carbon and is the reducing flame) **o reaction** See *oxidation, electronation*

oxido-reduction An oxidation reaction (q v) considered from both the oxidizing and reducing effects **o indicators** See *indicators* **o potential** r_H or rH Reduction intensity $r_H = \log 1/pH_2$, where pH_2 is the hydrogen gas pressure in atmospheres Cf *redox, rH*

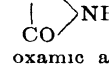
oximes A series of compounds containing the monovalent —CH(N OH) radical They are condensation products of aldehydes or ketones with hydroxylamine (See *aldoxime, ketoxime*) There are two isomeric types

acet- Acetoxime **ald-** Aldoxime **amid-** Amidoxime **di-** Ketoxime A compound containing two oxime radicals There are three types



dimethyldi- Dimethylglyoxime **form-** See *nitrolic acid* **glucose-** See *glucose* **lact-** See *lactoxime* **pent-** See *pentoxime*

o group The divalent >N OH radical

oximide C_2HO_2N = 71 1 The imide of oxalic acid,  Colorless prisms obtained from oxamic acid by dehydration with P_2O_5

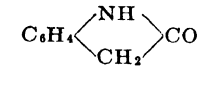
cyan- See *cyanoximide*

oximido Isonitroso The divalent radical, >N - OH **o compounds** A series of compounds containing the monovalent —NH CHO radical, or its derivatives

oximinoketone A compound of the type R CO - C NOH, they give a blue color with ferrous iron

oxin(e) 8-Quinolinol

oxindole C_8H_7ON = 133 1 α-indolinone, 2(3)-indolone, 2-ketoindoline, 2 3-dihydro-2-ketoindole The lactam of o-amino-phenolacetic acid, and a derivative of indole



Colorless needles, m 126, soluble in hot water, alcohol or ether Cf pseudo *indoxyl* **bi-** Indigotin **imino-** Imesatin **methyl-** Atroscine

oxirane. Ethylene oxide **methyl-** Propylene oxide

oxirene $CH\ CH\ O$ (ring) **methyl-** *1 2*-Epoxypropene*

oxo- A prefix indicating the presence of the ketogroup, as oxomalonic acid, HOOC CO - COOH **o compounds** Compounds having a keto group, excluding carboxylic acids, hence aldehydes, ketones, ketenes, quinones, lactones, etc

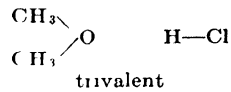
oxomalonic acid Mesoxalic acid

oxone "Oxygen cubes" Cubes of fused sodium peroxide with traces of CuO (as catalyst), used for making small quantities of oxygen in the laboratory by wetting the cubes Cf *autogenor*

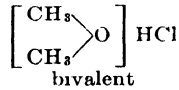
oxonite An explosive consisting of picric acid dissolved in nitric acid

oxonium compounds An addition compound or double compound (c) of an organic oxide with strong acids (HCl, $HClO_3$) or their salts ($SnCl_4$) They were at first considered to contain tetravalent oxygen (as in a), and later trivalent oxygen, coordinately combined (as in b) They are analogous to ammonium salts

tetravalent (a)



trivalent (coordinate) (b)



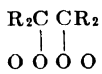
bivalent (addition compound) (c)

o ion The ion OH_3^+, which is believed to represent more accurately what is normally called the hydrogen ion (q v)

oxophenic acid Catechol

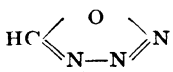
oxozone O_4 A supposed modification of oxygen containing 4 atoms of oxygen Cf *ozone*

oxozonide A group of unstable compounds formed by the addition of 4 atoms of oxygen to the double bonds of an unsaturated organic structure



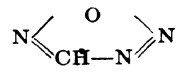
Cf *ozonide isoxozonide*

oxtriazole $CHON_3$ = 71 2 The heterocyclic compounds



1 2 3 4-

and



1 2 3 5- or iso-

oxy- (1) A prefix, infix or suffix indicating the presence of oxygen in a molecule (2) A prefix for the grouping —C—O—C— Cf *keto-, ether* (3) A misnomer for hydroxy, —OH **o acetylene** A mixture of oxygen and acetylene gases used in a blowpipe to obtain high temperatures (6000°F), it is used for cutting armor plates and welding **o hydrogen** See *oxyhydrogen* **o muriatic acid** An obsolete term for hydrochloric acid

oxyacanthine. $C_{19}H_{21}O_3N$ = 311 17 Vinetine An alkaloid from the root of *Berberis vulgaris*, barberry A white crystalline powder, m 210, soluble in alcohol, ether, or chloroform **o hydrochloride** $C_{19}H_{21}NO_3\ HCl\ 2H_2O$ = 383 - 67 Small white needles, soluble in water

oxyacetone Acetol

oxyacid An acid containing oxygen **inorganic-** A tertiary compound of an acid radical with hydrogen, as, $HClO_3$, H_2SO_4, H_3PO_4, H_4SiO_4 **organic-** An organic compound which contains both a —COOH radical and —OH group, as, CHOH COOH, glycocollic acid, or MeCOH COOH, lactic acid

oxyalizarin Purpurin

oxyamides Hydroxyamides A series of compounds containing the $—CONH_2$ and —OH radicals, as CHOH $CONH_2$, glycollamide, or MeCOH $CONH_2$, lactamide

oxyammonia Hydroxylamine

oxyammonium compounds Same as hydroxylammonium compounds (see *quaternary* amines)

oxyanthracene Anthrol

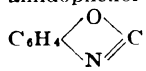
oxyazide A compound containing the $—N_3$ and —OH radicals, *e g* HO CH_2 CO—N=N_2, glycolazide

oxyazo- A prefix indicating the presence of the —N N— and —OH groups **o benzene** $C_{12}H_{10}ON_2$ = 198 2 The simplest oxyazo compound, C_6H_5 N N C_6H_4OH An orange-red crystalline powder **o compounds** An organic compound of the type, R N N - C_6H_4OH, obtained by the action of diazo compounds on phenols in alkaline solution They form a class of dyes

oxybenzene Misnomer for phenol

oxybenzoic Misnomer for hydroxybenzoic or salicylic

oxybenzoxazole $C_7H_5O_2N$ = 135 1 Carbonylamidophenol The heterocyclic compound,

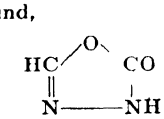


Colorless crystals, m 137

oxybenzyl Misnomer for hydroxybenzyl **o alcohol** Misnomer for salicylic alcohol

oxybiazole 1 3 4-Oxydiazole

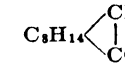
oxybiazolone $C_2H_2O_2N_2$ = 82 1 The heterocyclic compound,



oxybromide (1) An organic compound containing the —OH and —Br groups (2) The —OBr radical

oxyburserasin A substance obtained from myrrh, used medicinally

oxybutyric acid See *butyric acid* **o aldehyde** Aldol

oxycamphor $C_{10}H_{16}O_2$ = 168 1 

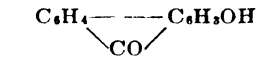
Colorless crystals, derived from camphor, m 204, slightly soluble in water, soluble in alcohol or ether, used medicinally (see *oxaphor*)

oxycannabin $C_{11}H_{11}O_4N$ = 221 1 A derivative of cannabinol

oxycanthine. Oxyacanthine

oxychinaseptol $C_{24}H_{20}O_4N_2(SO_2)$ = 464 4 Diaphtherin, oxyguinaseptol $C_6H_4(SO_2)(ONH - C_6H_6\ OH)_2$ Yellow hexagonal crystals, m 85, soluble in water or alcohol, used as an antiseptic Cf *diaphthol*

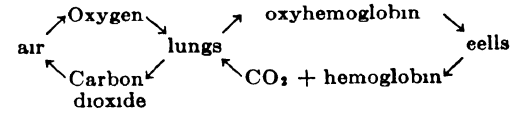
oxychloride Describing a compound which contains the —OH and —Cl radicals, or the —OCl radical
oxycholine Muscarine
oxychromatin Linin (1)
oxyconiine Conhydrine
oxydase Oxidase
oxydation Oxidation
oxydizing Oxidizing
oxyfluorenone $C_{13}H_8O_2$ = 196 1 o-oxydiphenylene ketone



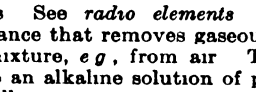
Colorless crystals, m 115
oxygal A trade name for sodium peroxide
oxygen O = 16 000 Oxygenium, vital air, sauerstoff A gaseous element, atomic number 8, which exists free in the atmosphere as O_2, and combined in many substances of the solid earth-crust It is the most abundant and most important of all chemical elements, and was Hooke's *nitre air*, first isolated Aug 1, 1774 by J Priestley (*dephlogisticated air*) and earlier (in 1773, but not published until 1777) by K W Scheele (*empyreal air*) Its role in nature was recognized by A L Lavoisier who developed the theory of combustion and oxidation A colorless gas, $d_{(air=1)}$ 1 1053, m −227, b −182, slightly soluble in water It occurs in three isotopic forms of masses 16, 17, and 18, in the proportions of 10 000 1 8 It is prepared either by fractional distillation of liquid air, or by electrolysis of water, and is shipped in steel cylinders Oxygen is the basis of atomic weights (O = 16), the valency system (O = 2), and the acid and base system (cf *ammonia system*) It is used medicinally in pulmonary diseases and anemia, with nitrous oxide ethylene, or other anesthetics, and with hydrogen, acetylene, or illuminating gas for producing high temperatures for welding, and melting metals **active-** Ozone, O_3 **allotropic-** Ozone, oxozone **hydroxyl-** The oxygen of the hydroxyl group **ketonic-** The oxygen of the >CO group **liquid-** See *liquid o* **radio-** A short-lived isotope obtained by bombardment of o with deuterons or alpha particles See *radio elements* o **absorbent** A substance that removes gaseous oxygen from a gas mixture, *e g*, from air The most common are an alkaline solution of pyrogallic acid, or metallic copper in ammoniacal solution of cuprous chloride Others are

	Absorpt rate
chromous sulfate reagent	100 %
cuprous chloride reagent	4 %
quinone hyposulfite	4 %
potassium pyrogallate	2 3 %

o **carrier** A catalytic substance that absorbs oxygen molecules and splits off oxygen as atoms o **difluoride, o fluoride** OF_2 = 54 00 A gas, which forms at low temperatures a yellow liquid, $d_{-190°}$ 1 65, m −223 8, b −146 5
oxygenase An enzyme that enables atmospheric oxygen to be utilised by the organism or in the system in which it occurs
oxygenate To enrich with oxygen
oxygenated water Water saturated with oxygen gas
oxygenation Saturation with oxygen
oxygenator Any apparatus for saturating or impregnating substances with oxygen
oxygenium The Latin name for oxygen
oxygenize (1) Oxygenate (2) Oxidize
oxyhematoporphyrin A pigment derived from oxyhemoglobin, and closely allied to urohematoporphyrin, sometimes found in urine
oxyhemocyanin The oxidized form of hemocyanin
oxyhemoglobin, oxyhæmoglobin Hematoglobulin, hematocrystallin The red pigment of the blood corpuscles of animals, it carries the oxygen to the individual cells of the body, and removes the carbon dioxide from them later



Molecular weight, 16 669, it contains 1 324 cc O_2 per gram
oxyhydrase An enzyme in vegetable and animal secretions that decomposes water to H^+ and OH^-
oxyhydrazides A series of organic compounds which contain the —OH group and the —$NHNH_2$ radical *E g*, $HOCH_2CONHNH_2$, glycolhydrazide HOCHMeCONHNH$_2$, lactohydrazide
oxyhydrogen An extremely explosive mixture of oxygen and hydrogen o **blowpipe** A burner in which a jet of oxygen is inside a jet of hydrogen, thus ensuring complete combustion of the two gases and an extremely hot flame o **flame** A blowpipe flame obtained by burning hydrogen with oxygen, which gives a temperature of 5000°F o **light** The "lime" light produced by heating calcium oxide with the oxyhydrogen blowpipe
oxyhydroquinone $C_6H_3(OH)_3$ = 126 1 1 2 4-Trihydroxybenzene, 2 4-dihydroxyphenol, a-hydroxy-hydroquinol Colorless crystals, m 140
-oxyl A suffix denoting the RO— group, as, methoxyl, MeO—, phenoxyl, PhO— Cf *hydroxyl*
oxylactone A lactone containing a —OH radical, as



CH CH$_2$OH, oxyvalerolactone
oxylepidine Dibenzoyl *stilbene*
oxyleucotin $C_{34}H_{32}O_{12}$ = 632 2 A crystalline principle from paracoto bark
oxylith A mixture of sodium peroxide and bleaching powder, used to generate oxygen for welding purposes
oxymalonic acid Tartronic acid
oxymel A medicated honey, containing clarified honey (80 %), acetic acid (10 %) and water (10 %)
oxymethoxyallylbenzene Eugenol
oxymethylconiferin Syringenin
oxymethylcresoltannin Cretaform
oxymethylene Formaldehyde o **diphosphoric acid** See *diphosphoric acid*
oxymorphine Dehydromorphine
oxymuriate Chlorate
oxymuriatic acid Chloric acid
oxyn A dihydroxy peroxide glyceride, a crystalline constituent of tung oil
oxynaphthoic acid $C_{11}H_8O_3$ = 188 1 α-naphthol carbolic acid, $C_{10}H_6(OH)COOH$ Colorless crystals, m 186, slightly soluble in water,

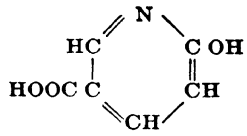
soluble in alcohol, ether, chloroform, or bicarbonate solutions, used medicinally as a disinfectant and antizymotic

oxynaphthoxazime Mukogen

oxynarcotine $C_{22}H_{23}NO_8$ = 429 14 White needles, soluble in alcohol

oxyneurine Betaine

oxynicotinic acid $C_6H_5O_3N$ = 139 1 2-hydroxypyridine-5-carboxylic acid



Colorless crystals, m 303 Cf *oxypicolinic, oxyquinolinic* acid

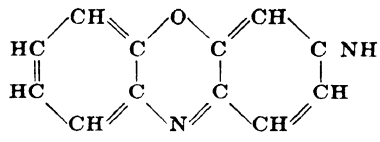
oxynitrilase An enzyme that decomposes hydroxynitriles to aldehydes

oxynitriles A group of organic compounds containing the —OH and —CN radicals *E g*, HO CH_2 CN, ethanolnitrile, glycollic nitrile, HO CHMe CN, ethidene lactic nitrile

oxynitroso Nitrito

oxyphenazone Resorufin

oxyphenoxazime $C_{12}H_8ON_2$ = 196 1 The heterocyclic compound,



Cf *resorufin*

oxyphenoxazone Resorufin

oxyphenyl Hydroxyphenyl, the radical, HO-C_6H_4— Cf *phenoxy*

oxyphile A cell structure that can be stained with acid dyes

oxyphor Oxycamphor

oxyphthalic acid α-Hydroxyphthalic acid

oxypicolinic acid $C_6H_5O_3N$ = 139 1 4-hydroxy-pyridine-2-carboxylic acid Colorless crystals, m 250 (see *oxynicotinic acid*)

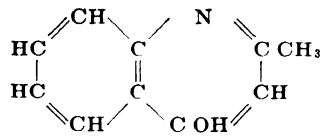
oxyproline $C_5H_9O_3N$ = 131 1 γ-Hydroxy-α-pyrrolidine-carboxylic acid An amino acid derived from gelatin or other proteins

oxypurinase An enzyme that oxidizes purine bodies

oxypyridine Pyridone

oxyquercetin Myricetin

oxyquinaldine $C_{10}H_9ON$ = 159 1 The heterocyclic compound,



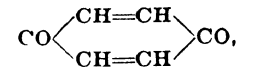
oxyquinaseptol Diaphtherin

oxyquinazoline Quinazolone

oxyquinoline C_9H_6N OH = 146 1 A hydroxy derivative of quinoline **o carboxylic acid** Kynurenic acid **o potassium sulfate** Chinosol **o sulfate** $(C_9H_7ON)_2H_2SO_4$ = 390 2 A yellow crystalline powder of saffron-like odor, m 175, soluble in water Used medicinally as a disinfectant and antiseptic in eye-washes, gargles, and nasal sprays **o sulfonic acid** Diaphthol

oxyquinolinic acid $C_6H_5O_3N$ = 139 1 2-hydroxypyridine-5 6-dicarboxylic acid (see *oxynicotinic acid*)

oxyquinones A group of derivatives of



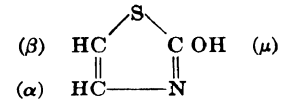
in which one or more of the hydrogen atoms are replaced by a hydroxy, methoxy, or ethoxy group

oxysalt A salt of an oxyacid

oxysparteine $C_{15}H_{24}ON_2$ = 248 4 An oxidation product of the alkaloid sparteine Colorless crystals, m 49, soluble in water, alcohol, or ether, used medicinally as a heart stimulant

oxysuccinic acid Malic acid

oxythiazole C_3H_3ONS = 101 2 μ-Hydroxy-metathiazole The heterocyclic compound,



methyl- β-methyl-μ-oxythiazole, 5-methyl-o Colorless crystals, m 160, soluble in water **phenyl-** α-phenyl-μ-oxythiazole, 4-phenol-o Colorless crystals, m 204, soluble in water

oxy-Tobias acid *2*-Naphthol-*1*-sulfonic acid

oxytocic A drug that increases the expulsive power of the uterus, as ergot and pituitrin

oxytocin α-Hypophamine

oxytoluol Cresol

oxytoxin An oxidation-product of a toxin, cf *oxytocin*

oxytropism The response of living cells to oxygen

oz Abbreviation for ounce or ounces *ozs* is incorrect **oz ap** Abbreviation for apothecaries' ounces = ℥ **oz av** Abbreviation for avoirdupois ounce **oz fl** Abbreviation for fluid ounce **oz t** Abbreviation for troy ounce

ozamin Benzopurpurin A red aniline dye

ozocerite Mineral wax, native paraffin, fossil wax, ozokerite A native mixture of hydrocarbons, translucent yellow, brown to greenish masses, soluble in carbon disulfide Used as an insulating material, for paints, leather polish, sealing wax, candles, etc **purified-** Ceresin

ozogen Hydrogen peroxide

ozokerite Ozocerite

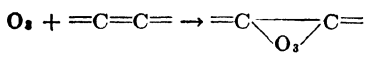
ozonation Impregnation or saturation with ozone (cf *ozonidation*)

ozonator Ozonizer Any instrument or device in which ozone is generated

ozone O_3 = 48 000 A modification of oxygen gas produced usually by a silent electric discharge in air or oxygen A faint blue gas of intense odor, $d_{(air=1)}$ 1 658, b −119, decomp 270, soluble in water, oil of turpentine or oil of cinnamon Used as an antiseptic, bactericide and oxidizing agent, and for bleaching oils, fats, textiles, and sugar solutions Cf *oxozone* **o paper** A filter paper impregnated with potassium iodide and starch, which turns blue on exposure to ozone, also a filter paper impregnated with indigo solution Cf *thallium ozone paper*

ozonidation To convert into an ozonide Cf *ozonization*

ozonides A series of compounds of ozone with unsaturated organic compounds containing a double bond



They form thick oily, unstable liquids Cf *ozozonide isozonide*

ozonization To treat with ozone Cf *ozonidation*

ozonize To sterilize with ozone, *e g*, drinking water

ozonizer (1) An apparatus for applying ozone to wounds (2) Ozonator Cf *Siemens o*

ozonolysis The treatment of hydrocarbons with ozone

ozotetrazone Vicinal *tetrazine*.

P

P (1) The symbol for phosphorus (2) An abbreviation for pressure, P_T at constant temperature, P_V at constant volume (3) Principal series of spectrum lines, as ^1P, ^2P (4) The sixth shell or orbit of electrons in the atom Cf *periodic chain, Bohr's theory* (5) Parachor

p (1) An abbreviation for *para* (2) The electrons responsible for the principal series of lines in the spectrum (3) Potential

p p m Parts per million

π, Π The Greek letter "pi" (1) An abbreviation for *peri-*, q v (2) The mathematical constant 3 1415 See *radius*

ψ Ψ The Greek letter "psi" (1) An abbreviation for pseudo (2) The symbol for the electric field of Schrodinger's atom

φ, ϕ, Φ The Greek letter 'phi" An abbreviation for phenyl

p_H, pH, P_H A symbol for the logarithm of the reciprocal of the hydrogen-ion concentration, C_H or $[H^+]$, hence, $p_H = \log \frac{1}{C_H}$

p-H Para-hydrogen (see *hydrogen molecule*)

Pa The symbol for protoactinium

Paal's method Reduction by hydrogen gas, with palladium as a catalyst

pachnolite The mineral $NaF\ CaF_2\ AlF_3\ H_2O$

pachyrhizid $C_{30}H_{24}O_{10}$ = 544 22 A glucoside obtained from *Pachyrhizus angulatus*

pacite Arsenopyrite

pack fong German silver

packing (1) A filling material (2) Crowding together **atomic-** The crowding of atoms which have lost electrons from some of the shells, and hence can approach each other more closely Such condition is assumed to exist in the interior of certain stars, which have an enormous density (up to 50,000 times that of water) Cf *spectral classification* **nuclear-** The crowding of hydrogen and helium nuclei and electrons within the atomic nucleus Cf *p effect*

p effect A loss of mass due to the crowding of protons and electrons in the atomic nuclei, as, in the hypothetical case $4H \rightarrow He$, where the atomic weight diminishes from $4 \times 1\ 008$ = 4 032, to 4 002 Cf *mass-energy cycle, cosmic radiation* **p fraction** An atomic constant which measures the forces holding electrons and protons together It is the deviation per unit mass of the isotopic weight from whole numbers (in parts per 10,000)

Element	*Packing fraction* $\times 10^4$	*Isotopic weight or mass*
H	77 8	1 00778
He	5 4	4 00216
Li^6	20 0	6 012
Li^7	17 0	7 012
B^{10}	13 5	10 0135
B^{11}	10	11 0110
C	3	12 0036
N	5 7	14 008
O	0	16 0000
F	0	19 0000
Ne^{20}	0 2	20 0004
Ne^{22}	2 2	22 0048
P	−5 6	30 9825
Cl^{35}	−4 8	34 983
Cl^{37}	−5 0	36 980
A^{36}	−6 6	35 976
A^{40}	−7 3	39 971

paddle A straight iron tool used for mixing and stirring ores in a furnace **p agitator** A stirring device for keeping solids in suspension during a reaction, or while being dissolved

paddy Threshed rice

padutin Kallikrein

pae, pæ- See *pe-*

paeonine Peonine

paeonol Peonol

pagodite Pinite The mineral $2Al_2O_3,K_2O,-3H_2O,5SiO_2$

pail A small bucket, sometimes graduated, for measuring liquids

paint A suspension of a finely-ground pigment in a vehicle, such as linseed oil, varnish, or turpentine The basis of nearly all paint is a white pigment (white lead, zinc oxide, barytes, etc) to which one or more colored pigments are added Cf *pigments* **luminous-** A suspension of zinc sulfide or barium sulphide in nitro-cellulose lacquer **water-** An aqueous mixture of pigment with casein or other glue

p mill A grinder that grinds to 200 mesh **p oils** An oil used for thinning paints, as, linseed oil, walnut oil, tung oil, poppy seed oil **p rock** Ocher **p remover** A preparation used to remove paint from a painted surface **p thinner** Turpentine or turpentine substitutes

paired electrons An electron couple, or a set of two valence electrons that forms the non-polar bond between two atoms, each atom furnishing one of the electrons in the pair Cf *twin electrons*

palaeontology Paleontology

palau An alloy of palladium and gold, used as a platinum substitute

paleontology. The science that treats of prehistoric forms of life as revealed by fossil remains of plants and animals

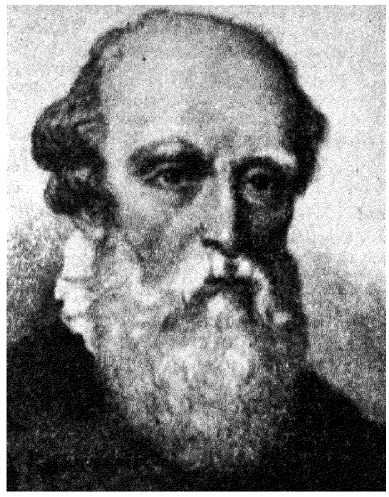
palicourine A crystalline alkaloid from *Palicourea* species, order Rubiaceae

Palissy, Bernard 1499–1589 A French naturalist and leader in chemical technology and scientific thought, noted as forerunner of Boyle

palite $C_2H_2O_2Cl_2$ = 128 9 Chloromethylchloroformate, $ClCOOCH_2Cl$ A poison gas used during the World War **super-** Superpalite

palladic Describing a compound containing tetravalent palladium, as, p dioxide, p disulfide

palladichloride A double salt of the type M_2PdCl_6 or $2MCl\ PdCl_4$



Bernard Palissy.

palladious. Palladous.

palladium. Pd = 106.7. A noble metal of the platinum group, atomic number 46, discovered in 1803 by Wollaston. A silver-white, ductile, malleable metal, d.11.4, m.1556, b.2300, insoluble in water or acids. It occurs native and alloyed with platinum metals; used in alloys with gold or platinum in dentistry and jewelry, and with copper or silver in watches, fountain pens, pencils, mirrors, and surgical instruments. Metallic palladium (as palladium black or sponge) is used as a catalyst and hydrogen absorbent. There are two series of compounds: palladous (valency 2) and palladic (valency 4). **allo-** A hexagonal or cubic variety of p., formerly confused with potarite. **p. alloys.** Any alloy of palladium with another noble metal; as, gold (palau), rhodium (rhotanium). **p. asbestos.** Asbestos coated with metallic palladium; used in gas analysis for absorption of hydrogen. **p. black.** A black powder of finely-divided palladium; used as a catalyst in the hydrogenation of oils. **p. bromide.** $PdBr_2$ = 266.5. Palladous bromide. A brown powder, insoluble in water. **p. chloride.** $PdCl_2, 2H_2O$ = 213.7. Palladous chloride. A dark-brown, hygroscopic, crystalline powder, soluble in water or acids. Used as a reagent for malic acid, cocaine or iodine; for the detection of mercury vapor; as a reagent for CO in gas analysis; medicinally, as a local germicide; in photography for toning; for porcelain prints, marking inks, and for coating instruments. **p. cyanide.** $Pd(CN)_2$ = 158.7. Palladous cyanide. A yellow solid, unstable to heat. **p. dioxide.** PdO_2 = 138.7. Palladic oxide. A black powder, decomp. 200, insoluble in water. **p. disulfide.** PdS_2 = 170.8. Palladic sulfide. A dark-brown powder; insoluble in water, soluble in nitric acid. **p. family.** The elements Ru, Rh and Pd of group 8 of the fourth period of the periodic table. **p. gold.** Porpezite. A native gold containing up to 10% palladium. **p. hydroxide.** $Pd(OH)_2$ = 140.7. Palladous hydroxide. A brown powder; insoluble in water (cf. *leptynol*). **p. iodide.** PdI_2 = 360.5. Palladous iodide. A black powder, m.100, b.360; insoluble in water, soluble in potassium iodide solution. **p. monoxide.** PdO = 122.7. A black powder, decomp. 875; insoluble in water. **p. monosulfide.** PdS = 138.8. Palladous sulfide. A black powder; insoluble in water. **p. nitrate.** $Pd(NO_3)_2$ = 230.7. Palladous nitrate. A brown, rhombic, crystalline powder; soluble in water but hydrolysed in dilute solutions; used as a reagent for ptomaines and for separating of Cl and I. **p. oxides.** See *p. monoxide, p. dioxide.* **p. potassium chloride.** See *potassium palladichloride, potassium palladochloride.* **p. sodium chloride.** Na_2PdCl_4 = 294.6. Sodium palladous chloride. A double salt; red hygroscopic crystals, soluble in water. Used as a reagent for gases (methane, carbon monoxide and iodine). **p. sponge.** A gray spongy mass of finely-divided palladium. Used in gas analysis, and as a catalyst for hydrogenation. **p. sulfate.** $Pd(SO_4)2H_2O$ = 238.8. Palladous sulfate. Brown crystals; soluble in water. **p. sub-sulfide.** Pd_2S = 245.5. An insoluble grey solid. **p. tube.** A glass tube filled with p. asbestos or p. sponge; used in gas analysis to absorb hydrogen.

pallado. Palladous.

palladous. Palladious. Describing compounds containing divalent palladium; as, palladium chloride, nitrate, or sulfate.

pallamine. Colloidal palladium.

pallas. An alloy of gold, palladium and platinum which is harder than platinum.

pallasite. A meteorite, consisting of a Ni-Fe sponge enclosing olivine.

palm. A tree of the order Palmae. **p. butter.** P. oil. **p. grease.** P. oil. **p. oil.** Oleum palmae, palm butter, palm grease. A semi-solid oil expressed from the crushed and fermented fruit of the West African oil palm, *Elaeis guineensis*, and other species. It consists of the glycerides of palmitic, oleic, and stearic acids and free palmitic acid; d.0.859–0.870, saponification value 196–205, m.33–46. Used in the manufacture of soap, candles, butter substitutes and lubricants. **p. kernel cake.** The residue which removes after expressing palm nut oil; used as a cattle food. **p. kernel oil.** Palm nut oil. **p. nut oil.** Palm kernel oil. A yellowish, fatty oil expressed from the crushed fruits of the West African oil palm, d.0.952, m.26–36, which consists of the glycerides of palmitic, oleic, and stearic acids. Used in the manufacture of soap and chocolate; in pharmacy for emulsions. **p. wax.** A yellow wax obtained from *Ceroxylon andicola*, a palm of tropical America (Ecuador); used as a substitute for bees-wax.

Palmae. Palm family, a group of tropical trees.

Areca catechu	areca nut
Serenoa serrulate	sabal
Arenga saccharifera	jaggery palm sago
Borassus flabellifer	palmyra sago
Caryo urens	toddy palm sago
Cycas circinalis	sago
Copernicia cerifera	carnauba
Ceroxylon andicola	ceroxylin, palm wax
Metroxylon species	sago
Calamus draco	dragon's blood
Elaeis guineensis	palm oil
Cocos nucifera	coconuts coconut oil

See also, *raffia, tagud nut coyol date palm, sago*

palmarosa oil Pamorusa oil An essential oil d 0 885–0 896, from gingergrass *Andropogon schoenanthus*, of South Africa, used as adulterant for oil of rose It contains perilla alcohol, geraniol and esters

palmellin The red coloring material, resembling hemoglobin, from the fresh water algae, *Palmella cruenta*

palmetto A tannin material from sabal, the partly-dried fruit of *Serenoa serrulata*, a tree of Georgia and Florida Used in tanning leather

palmic Palmitic

palmin A purified coconut fat used in the manufacture of butter substitutes

palmitamide $C_{16}H_{33}ON$ = 255 27 Palmitic acid amide, hexadecanamide* A colorless solid, m 93

palmitate Hexadecanate*, cetylate A salt of palmitic acid, which contains the monovalent $C_{15}H_{31}COO—$ radical

palmitic acid $C_{16}H_{32}O_2$ = 256 3 Hexadecanoic acid*, *n*-hexadecoic acid, palmic acid, cetylic acid, *n*-hexadecylic acid, ethalic acid, $C_{15}H_{31}COOH$, a saturated, fatty acid which occurs in many vegetable fats and oils Colorless needles, d 0 853 m 62, decomp by further heat, insoluble in water, soluble in alcohol or ether Used in the manufacture of soap **hydroxy-** Juniperic acid **p cyanide** Palmitonitrile

palmitin (1) $C_{51}H_{98}O_6$ = 807 1 Tripalmitin, the tripalmitic acid ester of glycerin, $C_3H_5(C_{15}H_{31}COO)_3$, which occurs in many vegetable fats and oils A colorless fatty mass, d 0 866, m 61, insoluble in water, soluble in alcohol, ether, chloroform, or benzene Used in the manufacture of soap (2) A glyceride of palmitic acid, as, monopalmitin, dipalmitin

palmitinic acid Palmitic acid

palmitoleic acid Zoomaric acid

palmitolic acid $C_{15}H_{27}COOH$ = 252 3 7-Hexadecynoic acid* An unsaturated fatty acid, in oils and Japan wax Colorless needles, m 47, insoluble in water, soluble in alcohol or ether

palmitone. $C_{31}H_{62}O$ = 450 65 *16*-Hentriacontanone* The ketone of palmitic acid, obtained by distillation with lime

palmitonitrile $C_{15}H_{31}CN$ = 237 3 Palmitic cyanide, hexadecanenitrile* Colorless scales d 0 832, m 30, b_{100mm} 251, insoluble in water, soluble in alcohol or ether

palmityl The monovalent radical, $C_{15}H_{31}CO—$, derived from palmitic acid. **p alcohol** Cetyl alcohol **p chloride** $Me(CH_2)_{14}COCl$ = 274 70 Hexadecanoyl chloride* Colorless liquid or crystals, m 11

palmoil Palm oil

Palmquist apparatus A portable gas analysis apparatus for the determination of carbon dioxide in the atmosphere

palmyra The palm, *Borassus flabellifer*, cultivated in Southern Asia The *wood* is used for rafters, the *leaves* for thatch, writing paper, mats, baskets and brushes, the *fruits* are roasted as food, the *sap* is used in making toddy and jaggery sugar, the *fibre* from the base of the leaves is used for brushes, and the young *seedlings* are eaten or ground to a fine flour

pamorusa Palmarosa

pan (1) A cylindrical vat for crushing or amalgamating gold ore (2) A flat iron tray for washing gold from sand and dirt (3) A flat container or tray, as, a balance pan, incinerating pan

pan- A prefix indicating all, or the whole

panabase. Tetrahedrite

panacea A universal remedy, generally applied to a quack medicine or cure-all

panacon $C_{22}H_{19}O_8$ = 317 2 A colorless crystalline substance from ginseng, the roots of *Aralia* or *Panax quinquefolium*

Panama bark Quillaja

panaquinol $C_{12}H_{25}O_9$ = 313 2 A bitter principle from ginseng, the root of *Panax quinquefolium* An amorphous yellow powder, soluble in water or alcohol Cf *panacon*

panase The digestive enzymes of pig pancreas A light, yellowish-white powder of slight odor and mucilaginous taste, used in medicine

panax (1) Ginseng (2) A genus of araliaceus plants

panchromatic Sensitive to light of all colors, (see *chromatic, pantachromatic*)

panclastite An explosive, nitrogen tetroxide dissolved in a combustible liquid, such as carbon disulfide

pancreas A gland below the stomach of mammals, it secretes a limpid, colorless fluid for the digestion of proteins, fats and carbohydrates

pancreatic juice The secretions of the pancreas containing the digestive enzymes and ferments, pancreatin, trypsin, amylopsin, steapsin, rennin, and invertin in alkaline solution Cf *pancreatin*

pancreatin Pancreatinum A mixture of the enzymes of the pancreas of warm-blooded animals It is obtained from the fresh pancreas of the hog or ox, as a cream-colored amorphous powder of faint odor and meat-like taste, which is slowly and partly soluble in water, but insoluble in alcohol, and should convert not less than 25 times its own weight of starch into water-soluble split-products Used medicinally, and contains amylopsin, trypsin and steapsin Cf *holadin* **p powder** A peptonizing powder

pandermite $Ca_2B_6O_{11}\ 3H_2O$ A native calcium borate used for the manufacture of boric acid

Paneth, Fritz 1887– A German physicist, noted for his work on radioactivity **P 's rule** A radio-element will be adsorbed by a solid substance if its electronegative radical can form, with the adsorbing substance, a compound that is relatively insoluble

paniculatine $C_{29}H_{35}O_7N$ = 509 28 An alkaloid, m 263, from the seeds of *Panicularia* (*Glyceria*) species, Gramineae of North America

pannic acid $C_{11}H_{14}O_4$ = 210 1 A constituent of rhizoma pannae Colorless crystals, m 192 Cf *pannol*

pannol $C_{11}H_{14}O_4$ = 210 1 A constituent of *Aspidium athamanticum*, a Filiceae Cf *pannic acid*

pansupari A mixture of betel and areca nuts and lime, used for chewing in India

pansy The dried herb of *Viola tricolor*, used as the fluid extract, as an expectorant and alterative

pantachromatic Existing in two or more colors, entirely achromatic, (cf *panchromatic*)

pantachromism The property of a compound that can exist in two or more differently-colored forms

pantal A corrosion-resisting aluminum alloy containing 4 2 % copper, 0 3–0 6 % manganese, 0 5–0 9 % magnesium

pantocaine $C_{14}H_{21}N_2O_2$ = 249 1 The β-dimethylamino ester of 4-butylamino benzoic acid, $Me(CH_2)_3NH\ C_6H_4\ COO(CH_2)_2NMe$ A local and spinal anesthetic, similar to procaine

pantochromism Pantachromism

pantogen Protyl

pantograph A device for copying diagrams etc to any scale It consists of a set of adjustable levers that connect a pencil with a tracing guide or stylus

pantomorphism The perfect symmetry displayed by crystals

pantopone A mixture of the hydrochlorides of the opium alkaloids as they occur in opium A yellowish-gray amorphous powder, soluble in water, used in medicine

paoferro The inner bark of the ironwood tree of Brazil, used as an antidiabetic

paopereira The bark of a Brazilian tree, used as a febrifuge

papain Papayotin, papase, caricin, carase, vegetable pepsin A protease or digestive ferment from the fruit of the papaw, *Carica papaya*, a tree of South America It is a grayish powder, soluble in water or glycerin, and an extremely active ferment for proteins (including fibrin) in alkaline or acid solution, used in medicine

papase Papain

Papaveraceae Poppy family, a group of herbs with a milky, narcotic juice, the source of many alkaloids

Papaver somniferum	opium, chundoo, kusamba, mudat, poppy capsules, poppy seeds
Papaver rhoeas	rhoeadine
Argemone mexicana	argemonine
Chelidonium majus	celandine
Eschscholtzia californica	ionidine
Glaucium flavum	glaucine
Sanguinaria canadensis	sanguinaria
Stylophorum diphyllum	stylophorum

papaveraldine $C_{20}H_{19}O_5N$ = 353 2 The ketone of papaverine

papaveric acid Rhoeadic acid $C_{16}H_{13}NO_7$ = 331 11 An oxidation-product of papaverine, m 233 (decomp)

papaverine $C_{20}H_{21}O_4N$ = 339 3 Tetramethoxybenzylisoquinoline An alkaloid from opium Fine, white rhombic prisms or needles, odorless, tasteless, m 148, insoluble in cold water, slightly soluble in alcohol, ether, or chloroform, used medicinally as a narcotic Cf *lodal* **p hydrochloride** $C_{20}H_{21}O_4N\ HCl$ = 375 8 Colorless crystals, soluble in water, used in medicine

papaverinol $C_{20}H_{21}O_5N$ = 355 2 A hydroxypapaverine

papaveroline $C_{16}H_{13}O_4N$ = 283 2 Tetrahydroxybenzylisoquinoline A derivative of papaverine, in which the methoxy groups are replaced by hydroxy groups

papaw (1) The edible fruit of papaya (2) Erroneously applied to pawpaw, q v

papaya Papaw, melon tree The tropical shrub or tree, *Carica papaya*, of the order Passifloraceae, which yields a delicious fruit and milky juice containing proteolytic enzymes (papain), a milk curdling ferment, caricin, myrosin and carpain Used by natives to make tough meat tender Cf *papayotin, caricin*

papayotin The dried milky juice of papaya that contains papain

paper A fabric which chiefly consists of the fibers of cellulose, *e g* , obtained from wood pulp, cotton, straw or esparto **alkannin-** A filter paper dipped in alkannin solution, and used as a test paper **art-** A paper coated on one or both sides with a mixture of a white or colored pigment (*e g* , satin white) and an adhesive (*e g* , casein), and dried and calendered to a high finish Used for printing from fine-screen half-tone blocks Cf *chromo-p* **asbestos-** A thin asbestos board or a tissue made from asbestos fibres **azolitmin-** A filter paper dipped into a solution of azolitmin, used in place of litmus paper **bank-, bond-** A thin strong writing paper **blueprint-** q v **carbon-** q v **chromo-** An art paper, usually with a duller finish **congoblue-** q v **coordinate-** q v **dahlia-** q v **dialyzing-** A parchment paper used for dialyzing **drying-** An absorbent paper **emery-** A paper coated with abrasive material **filter-** A porous, unsized paper used as an absorbent and for filtering **glass-** An abrasive p coated with broken glass **glazed-** A paper coated with a filler (*e g* , barytes) and highly calendered It has a shiny surface and is used in analytical operations for transferring precipitates **imitation art-** A paper with a high finish, obtained by addition of a high proportion of loading and calendering Cf *art p* **lens-** A soft tissue paper used for wiping the lenses of microscopes **linen-** A paper made from linen rags **l -faced-** A paper that has been embossed with linen, an impression of which is retained on its surface **litmus-** A filter paper impregnated with red or blue litmus solution used as a test paper for acids and alkalis **niter-** A paper impregnated with saltpeter **ozone-** See *ozone* **paraffined-** A p saturated with hot paraffin, used for electrical insulation, waterproofing, etc **parchment-** A paper treated with conc sulfuric acid or zinc chloride, it is water- and grease-proof, and used in dialyzing solutions **polarity-** q v **sand-** q v **silver nitrate-** q v **starch-** q v **test-** A filter paper impregnated with some indicator solution and generally used to determine the acid or basic character of a solution or the presence of a certain substance (see *indicators, test papers*) **tissue-** A very thin paper **turmeric-** A filter paper dipped in turmeric solution, used to identify boric acid (red color) **varnished-** A p treated with varnish, used for electrical insulation, or for labels **vulcanized-** See horn *fiber* **wax-** A paper made waterproof by treating it with paraffin wax

p analysis See *Herzberg's stain* **p board** (1) A thick sheet of paper pulp mixed with size and filling materials Cf *pasteboard, millboard* **p coal** A variety of brown coal that occurs in thin layers **p colors** Aniline dyes used for coloring paper **p filter** A cone made of filter pulp, or a thimble made of thick filter paper **p pulp** The mixture of fibres and water from which paper is deposited by drainage on wire mesh Cf *chemical-, mechanical-, soda-, sulfite- and sulfate-pulp, Herzberg's stain* **p spar** A variety of calcite, which occurs in thin paper-like plates

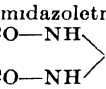
papier maché A substance used for moulded articles, made by boiling old paper with water

and glue, and soaking the semi-dried product in linseed oil

paprika A finely-ground variety of red pepper used as a spice, it is rich in ascorbic acid (vitamin C)

para- A prefix (1) derived from the Greek "beyond" or "opposite," which indicates the 1 4-position (para-compounds) of the benzene ring, (2) indicating an *even* rotational quantum number, as in *para*-hydrogen, or *para*-nitrogen, (3) to denote polymerization, as, paraformaldehyde, (4) to indicate the amount of water, as in paraperiodic acid, (5) to show a relationship, as in paracasein **p compounds** See usually under the parent compounds

Para arrowroot Tapioca

parabanic acid $C_3H_2O_3N_2,H_2O$ = 132 07 Oxalylurea, imidazoletrione, the ureid of oxalic acid,  Colorless plates, m 227 (decomp), slightly soluble in water, soluble in alcohol or ether **dimethyl-** Cholestrophan

parabituminous Applied to a gas-coal having good caking properties

parabola A plane curve, each point of which is equidistant from a straight line (axis) and a central point (focus) Such a curve will resemble a circle at some points and a straight line at others Cf *elliptic*

paraboloid The surface traced by a parabola when its vertex is always on another parabola **p condenser** A spherical mirror having an elongated focus, used on microscopes

parabuxin $C_{24}H_{48}ON_2$ = 380 4 An alkaloid in common garden box, *Buxus sempervirens*, an Euphorbiaceae

paracasein Casein digested with rennin

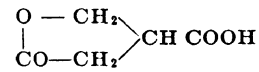
paracellulose A variety of cellulose from the pith of plants

Paracelsus 1493–1541 Philippus Aurelius Theophrastus Paracelsus Bombastus von Hohenheim A Swiss physician and alchemist, the founder of pharmaceutical chemistry, and advocate of chemical as opposed to vegetable remedies Cf *iatrochemistry*

parachor The quantity $P = M\gamma^{\frac{1}{4}}(D - d)$, where γ is the surface tension, M the molecular weight and D and d the densities of a compound in the liquid and vapor state, respectively, at the same temperature Thus the parachor is an expression of the molecular volume, and equals 0 78 × critical volume A comparison of the parachors of liquids is equivalent to a comparison of their molecular volumes at temperatures at which they have equal surface tensions Since the parachor is an additive constant for saturated compounds it is used to determine chemical constitution, *e g* ,

H = 17 1				F = 25 7	
C = 4 8	N = 12 5	O = 20 0		Cl = 54 3	
Si = 12 0	P = 37 7	S = 48 2		Br = 69 0	
				I = 91 0	
double bond = 23 2		*three-ring* = 15 5			
triple bond = 46 4		*four-ring* = 11 6			
		five-ring = 9 3			
		six-ring = 7 7			

Thus the increase in parachor for a molecule is 23 2N/Z, where N is the number of hydrogen atoms needed to saturate, and Z the number of atoms in the ring

paraconic acid $C_5H_6O_4$ = 130 0 Itamalic acid-γ-lactone, tetrahydro-*5*-oxo-*3*-furan carboxylic acid The heterocyclic compound,  Colorless crystals, m 58 Cf *citraconic acid* **dimethyl-** Terebic acid **phenyl-** Phenyl paraconic acid

paraconine $C_8H_{15}N$ = 125 1 An alkaloid obtained by heating butyric aldehyde with ammonia, a colorless liquid with a stupefying odor, b 170

paracoto The dried bark of an unidentified tree of Northern Bolivia Used as the fluid extract, as a substitute for coto bark, q v It contains cotoin, paracotoin, leukotine, oxyleukotine, protocotoin and essential oils

paracotoin $C_{12}H_8O_4$ = 216 1 An active principle derived from paracoto, yellow crystals, m 150, soluble in alcohol

paracotoinic acid $C_{12}H_8O\,H_2O$ = 186 1 An amorphous substance obtained by boiling paracotoin with potassium hydroxide

paracyanogen $(CN)_6$ = 156 12 An insoluble solid, which sublimes if heated

paradiazine Pyrazine

paradichlorobenzene See *benzene*

paradimethylaminobenzaldehyde $C_9H_{11}ON$ = 149 1 $C_6H_4(CHO)NMe_2$ Used as a reagent for detecting indole, skatole, pyrrole, and other organic compounds

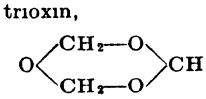
paradioxybenzene Hydroquinone

paraffin (1) See *paraffins* (2) A white, waxy, solid substance, d 0 890, m 43–65, insoluble in water, acids or alkalis, soluble in alcohol, ether, or chloroform P occurs native in ozocerite, peat, and bituminous coal, and is a constituent of petroleum from which it is distilled It consists of a mixture of hydrocarbons, used in the manufacture of candles, waxed paper, matches, lubricants, oil crayons, and for waterproofing wood and cork (3) See *kerosene* **liquid-** Petrolatum **p bath** Molten paraffin **p oil** Petrolatum **p scale** A crude paraffin **p wax.** Paraffin (2)

paraffins (1) Alkanes (2) A group name for the saturated aliphatic hydrocarbons of the methane series, C_nH_{2n+2} **iso-** An aliphatic saturated hydrocarbon containing one —CHMe— group or a side chain **neo-** An aliphatic saturated hydrocarbon containing one —CMe_2— group **normal-** An aliphatic saturated hydrocarbon containing only CH_3— and —CH_2— groups **meso-** An aliphatic saturated hydrocarbon containing two —CMe_2— groups, as, mesohexane, $Me_2CH—CHMe_2$

paraffinum Paraffin (2)

paraform Paraformaldehyde

paraformaldehyde $(CH_2O)_3$ = 90 04 Paraformaldehydum, paraform, triformol, trioxymethylene, trioxin,  A colorless amorphous powder, m 150, soluble in water, insoluble in alcohol or ether, used as an antiseptic Cf *paraldehyde*

parafuchsin $C_{19}H_{18}N_3Cl$ Para rosaniline chloride, $(C_6H_4NH_2)_2{=}C{=}C_6H_4{=}NH\,HCl$ A dye Cf *pararosaniline*

paraglobulin Fibroplastin, serum-globulin A globulin from blood-serum and lymph It is precipitated as a white amorphous substance on passing carbon dioxide through diluted blood-serum

paragonite $Al_2NaH_2Si_3O_{12}$ A silica mineral (q v) of the mica group Cf *muscovite*

Paraguay tea Maté

parahemoglobin A crystalline form of hemoglobin

parahiston A protein from thymus, rich in sulfur

parahydrogen See *hydrogen molecule*

paralactic acid Sarcolactic acid

paralbumin A protein from ovarian cysts

paraldehyde $(C_2H_4O)_3$ = 132 1 A polymer of acetaldehyde A colorless, transparent liquid, of strong pungent odor, d 0 994, m 10, b 124, soluble in water Used as a reagent for alkaloids and fuchsin, medicinally, as a hypnotic and sedative Cf *metaldehyde, aldol*

paraldol $C_8H_{16}O_4$ = 176 12 A polymer of aldol, m 82, of the type $(C_4H_8O_2)_2$

paraleucaniline $C_{19}H_{19}N_3$ = 289 28 The leuco-base corresponding with pararosaniline

parallax The apparent displacement of an object by a change in the position of the observer, *e g* , the cause of error in reading the liquid meniscus in a buret

parallel (1) Running side by side, always having the same direction, but separated by equal distances (2) Electrical connections such that the like poles of a number of units are connected to one other, or to the same terminal (cf *series*)

parallelosterism The relationship which exists between isomorphous groups and their chemical compositions or physical properties

paralyser Paralyzer

paralysol MeC_6H_4OK A mixture of cresol and potassium cresolate Colorless crystals, m 146, insoluble in water, used medicinally as an antiseptic

paralyst Paralyzer

paralyzant A substance that causes paralysis

paralyzer. An agent that prevents a chemical reaction, a catalytic poison

param $C_2H_4N_4$ = 84 2 Cyanoguanidine A condensation product of cyanamide, obtained by heating it to 150, $N{\equiv}C\ NHC(\ NH)NH_2$, m 204, soluble in water, alcohol or ether

paramagnetic A substance that has magnetic properties greater than those of air, as, iron, cobalt, and nickel Its magnetic permeability is thus greater than unity

paramagnetism The property of being attracted by a magnet, as opposed to diamagnetism

paramecium A genus of unicellular animals or protozoa, often used in biological experiments

paramide Mellimide

paramorph A crystal that has changed physically but not chemically

paramorphine Thebaine

paramorphism The physical change of a mineral from one modification to another, without a change of chemical composition, a rearrangement of molecular structure

paramucic acid $C_6H_{10}O_8$ = 210 1 An isomer of mucic acid

paramucosin $C_{12}H_{23}O_{10}N$ = 341 3 A substance from the salivary proteins

paramyelin $C_{38}H_{75}O_9NP$ = 720 7 A white, solid mass, isolated from brain and nerve substance

paramylum $C_6H_{10}O_5$ = 162 1 A carbohydrate isolated from certain protozoa

paranaphthalene An early name for anthracene

paranephrine Adrenalin

paranitraniline $NO_2C_6H_4NH_2$ = 138 2 Paranitroaniline A yellow, crystalline powder, m 148 3, soluble in alcohol or ether Used as a reagent for ammonia, uric acid, saccharin, lignin, and bile pigments and in the manufacture of dyes

parapectic acid $C_{24}H_{34}O_{23}$ = 690 3 An oxyacid developed from pectose during the ripening of fruits

parapeptone Syntonin

paraplasm (1) The more liquid portions of the protoplasm of a cell (2) The non-living part of protoplasm

Paraquay tea Maté

paraquinanisol $C_{10}H_9ON$ = 159 1 A synthetic alkaloid used medicinally as an antipyretic

paraquinoid Quinoid

parared A red aniline dye obtained from p-nitraniline

pararosaniline $C_{19}H_{19}ON_3$ = 305 3 Triaminotriphenyl carbinol $(NH_2C_6H_4)_3C\ OH$ An organic base that forms brilliant red-colored salts with acids, and is used extensively as a dye Colorless leaflets, m 188, insoluble in water, soluble in dilute acids, alcohol, or ether **hexamethyl-** Methyl violet **p chloride** Parafuchsin **p dyes** A group of dyes derived from pararosolic acid, *e g* , pararosaniline, methyl violet, triphenylpararosaniline, etc

pararosolic acid Aurin

parartrose $C_{120}H_{192}O_{40}N_{30}S$ A proteose obtained by digestion of wheat

parasite Any organism that lives on and obtains its nourishment from another living animal or vegetable organism (cf *saprophyte, epiphyte*), some cause disease They may be grouped into *Phyto*parasites, or *vegetable* parasites, such as bacteria and fungi, and *Zoö*parasites or *animal* parasites, such as protozoa and metazoa (worms, etc) Each of these is again divided into occasional, temporary, or obligate, and constant, stationary or facultative parasites

parasiticide An agent that destroys parasites, *e g* , sulfur, mercury, β-naphthol, kerosene

parasitotropic A compound that acts specifically on protozoa (see *organotropic*)

parasorbic acid $C_6H_8O_2$ = 112 1 An acid obtained from the berries of the mountain ash, sorbus

paratartarics Racemic forms

parathesin Benzocaine

parathyrin The active principle of the parathyroid gland

parathyroid One of the small glands beside the thyroid gland **p gland** The dried or desiccated exterior parathyroid gland of the ox, free from fat A light yellow powder of peculiar odor, which is slightly soluble in water, used in medicine as a nervine

paraxanthine $C_7H_8O_2N_4$ = 180 2 *1 7*-Dimethylxanthine, urotheobromine, a leukomaine in urine A colorless crystalline powder, soluble in water, used in medicine It is an isomer of theobromine and theophylline **amino-** Paraxine

paraxine $C_7H_{10}O_2N_5$ = 196 2 Dimethylamino-p-xanthine White crystals, m 226, soluble in water, used medicinally as a diuretic

paraxylene. See *xylene.*

parchment. A specially-prepared animal skin. **imitation-, vegetable-** P. paper.

p. paper. Vegetable parchment. A paper that has been treated with conc. sulfuric acid and is waterproof and grease resistant.

paregoric. A flavored camphorated tincture of opium, used for cough mixtures.

pareira. Perieira. The dried root of *Chondrodendron tomentosum*, a Menispermaceae of South America which contains the alkaloid bebeerine; used medicinally.

pareirine. Pereirine.

parenchyma. The principal constituent of the thin cell-wall tissue of vegetable matter.

parent substance. A compound from which derivatives or substitution products can be obtained.

parhelium. A form of helium in which both electrons move in one orbit; it gives the principal spectral line, 20.528 Ångström units.

pariantite. An asphalt from the pitch lake in Trinidad.

paricine. $C_{16}H_{18}ON_2$ = 254.3. An amorphous alkaloid from cinchona bark.

paridin. $C_{16}H_{28}O_7$ = 332.3. A glucoside from *Paris quadrifolia*, a Liliaceae. Cf. *paristyphnin.*

parietic acid. Chrysophanic acid.

parietin. Physcion.

pariglin. Smilacin.

parilla. Sarsaparilla. **yellow-** Menispermum.

parillic acid. Parillin.

parillin. $C_{40}H_{70}O_{18}$ = 838.6. Parillic acid. A glucoside from the sarsaparilla root. Colorless needles or scales (cf. *smilacin*).

parinaric acid. $C_{18}H_{28}O_2$ = 276.22. An unsaturated acid from the kernel fat of *Parinarium laurinum*, a Rosaceae.

Paris black. Lamp black. **P. blue.** Ferric ferrocyanide. **P. green.** $Cu(C_2H_3O_3)_2.3Cu(AsO_2)_2$. Schweinfürter green, copper acetoarsenite. A green pigment used as an insecticide in spraying plants. **P. red.** (1) Colcothar. (2) Minium. **P. violet.** Methyl violet. **P. yellow.** Lead chromate.

parisite. A native fluoride and carbonate of the cerium metals; brownish-yellow hexagonal pyramids.

paristyphnin. $C_{36}H_{64}O_{18}$ = 808.6. A glucoside in the root of *Paris quadrifolia*, the one-berry, a common European herb. Cf. *paridin.*

Parkes, Samuel. 1761–1825. An English technical chemist, noted for his writings and industrial methods. **P. process.** A method of refining argentiferous lead by liquation, followed by the addition of zinc to the molten mass, and skimming the surface crust which contains silver and zinc. The silver is recovered by distilling the zinc, and the lead purified by electrolysis.

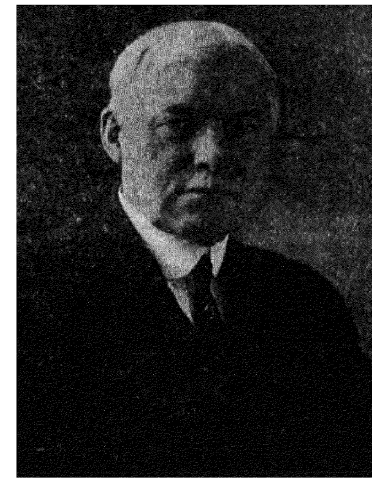
parkine. An alkaloid from the seeds of *Parkia biglandalosa*, a Leguminosae of Africa (nitta tree).

Parma blue. A triphenylrosaniline dye. **p. violet.** Rosaniline violet.

parodyn. Antipyrine.

paroxazine. *1.4.*[*2*]-Oxazine.

Parr, Samuel Wilson. 1857–1931. An American chemist noted for research in calorimetry and fuel technology. **P. apparatus.** A device for determining the total carbon in coal, coke, and other fuels by means of a calorimeter and gas burets.



Samuel Wilson Parr.

parsec. An astronomical unit of distance: the distance of a star whose annual parallax is 1 second of an arc. 1 parsec = 3.08×10^{13} km. = 19.2×10^{12} miles = 3.26 light years = 206,265 astronomical units (distance of earth to sun).

parsley. The umbelliferous plant *Carum* (*Apium*) *petroselinum* or *Petroselinum sativum.* It contains an essential oil and a camphor (apiol). Cf. *petroselinum.* **p. camphor.** Apiol. **p. fruit.** Parsely seeds. **p. leaves oil.** An essential oil from the leaves of p., d.0.900–0.925, greenish-yellow and of strong parsley odor; it contains apiol. **p. oil.** An oil distilled from parsley seeds. A colorless or pale-green liquid, d.1.07, insoluble in water, soluble in alcohol, ether, or chloroform; used in medicine, and contains apiol and pinene. **p. root.** Petroselini radix. The dried root of parsley; used medicinally as a fluid extract. **p. seeds.** Petroselinum. The seeds of parsley, used medicinally as a fluid extract, and contain apiol.

parthenicine. Parthenine.

parthenine. An alkaloid from *Chrysanthemum* (*Parthenium*) *hysterophorum*, a Compositae of the Gulf States and West Indies; used medicinally as an antipyretic.

parthenogenesis. Development of the egg without previous fertilization by a male agency. Cf. *agamy.*

partial. Fractional. A proportion of the whole. **p. pressure.** The fraction of the total pressure exerted by each constituent of a gas mixture. The sum of the partial pressures is equal to the total pressure; hence, the partial pressures are proportional to the concentrations of the individual gases in a mixture (see *Dalton's Law*). **p. valence.** An excess valence or fractional valence of a compound, responsible for the formation of addition compounds. Cf. *coordinate valence.*

particle. A small quantity of matter. **alpha-** Helium nucleus. **beta-** Electron. **colloidal-** See *colloids.* **gamma-** A misnomer for cathode rays. **nuclear-** See *subatomic p.* **subatomic-** Nuclear p. One of the "building stones" of matter, *i.e.*,

	Mass of $_{18}^{1}{}_{00}$ H	Mass of 1 H
Charge −1....	*electron* (*negatron*) e^- or −	(*neg. proton*)
Charge 0.....	*neutrino* (*photon*) $_0n^0$	*neutron* $_0n^1$
Charge +1....	*positron* (*oreston*) e^+ or +	*proton* *p* or $_1H^1$

Also the *deuteron* (*diplon*) of mass 2, and the *alpha-particle* of mass 4. Cf. *nuclear reactions.*

particle distribution. See *Perrin equation.*

parting. In assaying: the dissolution of silver from gold by means of nitric acid. **p. acids.** The nitric acids of various strengths used in the stages of the parting process.

partinium. An alloy of tungsten and aluminum.

partition. The distribution of a substance or ions between two immiscible liquids, or between a liquid and a gas. **p. coefficient.** Distribution coefficient, see *Perrin equation.* **p. law.** *Nernst's law.*

partridge berry. (1) Squaw vine. (2) Gaultheria.

Partz cell. A voltaic cell (2.06 volts), which consists of an anode of amalgamated zinc in a solution of magnesium sulfate, and a cathode of carbon in a solution of potassium dichromate.

parvoline. $C_9H_{13}N$ = 135.2. **alpha-** 2-ethyl-3.5-dimethylpyridine. A ptomaine from decaying fish or meat. An oily, amber-colored liquid, with the odor of hawthorn blossoms, b.188. **beta-** See *parvuline.*

parvuline. $C_9H_{13}N$ = 135.2. v-Tetramethylpyridine, β-parvoline. A homolog of pyridine, and an isomer of parvoline in coal tar. An amber-colored liquid, b.228.

Pascal, Blaise. 1623–1662. A French scientist and philosopher. **P.'s law.** The pressure applied to a liquid at any point is transmitted equally in all directions; the pressure in a liquid not subjected to external forces is equal at all points.

Paschen, F. A German physicist noted for his work on atomic structure. **P. galvanoscope.** A sensitive milli-amperemeter. **P. series.** The spectrum lines produced when electrons fall from an outer orbit to the third ring: $\frac{1}{\lambda} = N\left(\frac{1}{3^2} - \frac{1}{n_2{}^2}\right)$. Cf. *Balmer* and *Lyman series, energy levels, Bohr theory.*

pasque flower. Pulsatilla.

passiflora. Passion-flower.

Passiflorinae. An order of plants comprising the families: *Passifloraceae, Caricaceae, and Begoniaceae.*

passion-flower. Passiflora. The dried herb of *Passiflora incarnata,* a Passifloraceae of North America. Used medicinally as the fluid extract, as a sedative; the juice of its fruit is a beverage.

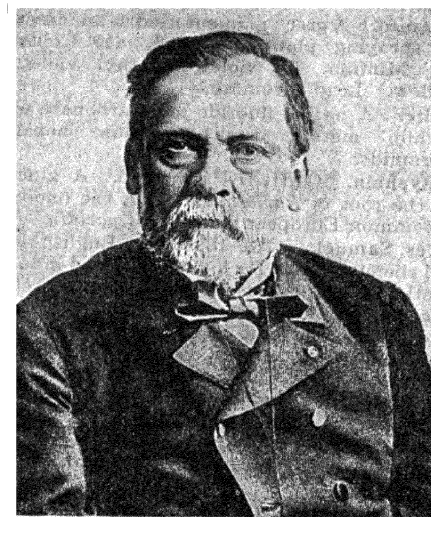
passive. Not active. **p. immunization.** The process by which the blood serum of an actively-immunized animal is injected into another animal, and protection against bacterial invasions conferred (immunization by an immune serum). **p. iron.** Iron or other metal rendered non-corrodible by treatment with heat or strong acids, *e.g.,* conc. nitric acid. This property is sometimes lost by mechanical shock. **p. state.** Passivity.

passivity. An inertness exhibited by substances under conditions in which chemical activity is to be expected; *e.g.,* certain metals will not dissolve in acids of high concentration while in the dilute acids they dissolve rapidly. The explanation is the formation of a thin layer either (a) of peroxide, (b) of oxygen, or (c) of salt, which prevents direct contact of acid and metal. Mechanical shock destroys this layer. Cf. *zone.*

paste. (1) A tenacious substance for cementing; or any viscid glue used for fastening paper on paper, boards, wood, metal, or glass. (2) A pharmaceutical preparation containing various antiseptics for external use. (3) A preparation containing poisons for exterminating vermin and rats. (4) A mixture of clay and water for making stoneware and porcelain. (5) The matrix or mineral substances in which other minerals are embedded. **dextrin-** Mix. 8 pds. of dextrin in 1 gallon cold water and let stand for 24 hours. Dissolve separately in warm water 2 oz. alum, 6 oz. glucose, 6 oz. glycerin, and add to dextrin; add ½ oz. formaldehyde and dilute the mixture to 2 gallons. **London-** A mixture of equal parts sodium hydroxide and slaked lime, moistened with alcohol. **phosphorus-** A rat poison made of phosphorus and flour. **Vienna-** A mixture of sodium hydroxide and slaked lime, moistened with water.

p. blue. Prussian blue. **p. board.** Cardboard formed by pasting fairly high-grade outer layers of paper (a pasting) on to a lower-grade middle layer or layers. It differs from an ordinary board, which is formed directly in layers on a board machine without an adhesive.

Pasteur, Louis. 1822–1895. A French chemist noted for his research on stereochemistry, fermentation and bacteria. He established



Louis Pasteur.

the connection between bacterial growth and disease, and laid the foundation of immunology. **P. filter.** See *filter.* **P. flask.** A glass flask with a neck nearly 6 times as long as the diameter of the flask. At a third of its length the neck is constricted and bent downwards (about 25°); the neck is then expanded again

for some distance, then again constricted The end bends upward On the opposite side from the bent neck there is a tubular outlet It is used for bacterial cultures

pasteuring Pasteurizing

pasteurization A partial sterilization of organic fluids by heating at 65°C for not less than thirty minutes Cf *Stassanization* **flash-** Continuous p by passing the liquid through a coil surrounded by live steam

pasteurized milk A milk that has been partly sterilized by heating at not less than 145°F (63°C) and not more than 150°F (66°C) for at least 30 minutes, and then immediately cooled to a temperature of not more than 55°F (13°C)

pasteurizer A machine used for the process of pasteurization

pasteurizing The process of preserving organic fluids by the destruction of the contained ferments and fungi by heating at 60°–70°C

pastil, pastille A lozenge, a sugared confection, or an aromatic mass burnt as incense or fumigant

pasting See *pasteboard*

patchoulene $C_{15}H_{24}$ = 204 19 A sesquiterpene, d 0 930, b 256, from patchouli oil

patchouli Patchouly The herb, *Pogostemon patchouli*, a Labiatae of India, used in perfumery, it has a very persistent odor **p oil** An essential oil from the leaves of patchouli A yellow liquid of aromatic odor, d 0 970, insoluble in water, soluble in alcohol or ether, containing cadinene, eugenol, cinnamic aldehyde, and other terpenes, used in perfumery

patchoulin $C_{15}H_{26}O$ = 222 2 A terpene from patchouli oil Colorless crystals, m 59, b 296

patchouly Patchouli

patent (1) A grant conveying public lands from the Government, *e g* , for mining purposes (2) Letters of patent Any process, method, or device that has been accepted as new by the Patent Office and is thereby, protected under the patent laws for a number of years (3) Evident, not hidden **provisional-** An official application for a patent, which gives temporary protection until the final patent is granted at a relatively small cost **p blue** A phenylated rosaniline disulfonic acid, used as a redox indicator **p yellow** PbO $PbCl_2$ Mineral yellow A yellow pigment, which consists of lead oxide and lead chloride

Patera process A method of producing silver from its ores by chloridizing, roasting and leaching with water and then with sodium hyposulfite which dissolves the silver, precipitation with sodium sulfide, and finally by heating the silver sulfide

path (1) Orbit (2) The course or track along which electrons, ions, or molecules move The fog-condensation method of C T R Wilson enables the trails of α-particles, electrons from β-rays and cathode rays, and the ionization caused by the passage of x-rays to be recorded photographically **free-** The average distance between collisions in the travel of a molecule in a gas or liquid

pathochemistry Chemical pathology That branch of biochemistry which deals with the chemical changes of the living organism in a diseased condition

pathogen Any microorganism, bacterium, or protozoon that produces disease

pathogenic Describing an agent that produces disease

pathologic Pertaining to a diseased condition **p reaction** A chemical test used in the diagnosis of disease

pathology A branch of medicine that deals with the nature of disease, especially with the functional (physiological) and structural (morphological) changes produced by disease **experimental-** The study of artificially-produced disease in the animal organism **phyto-** The study of plant diseases

patina The thin and often multicolored coat of oxides formed on metallic surfaces

patronite A native vanadium sulfide, V_2S_3

pattern (1) A design or arrangement of symbols or figures (2) A model from which a cast is made **crystal-** A space-lattice of crystal structure, q v **Laue-** See *Laue diagram*

Pattinson process A method of partly separating silver from lead, by fractional crystallization of the argentiferous lead and removal of the separated, molten, silver-free lead crystals This method has been superseded by the Parkes process, q v

paucine $C_{27}H_{38}O_5N_5$ = 512 3 An alkaloid from the seeds of *Pentaclethra macrophylla*, a Leguminosae of Africa Yellow scales, m 126, insoluble in ether or chloroform **p hydrochloride** $C_{27}H_{39}O_5N_5\ 2HCl\ 6H_2O$ = 693 4 Colorless needles, m 245, slightly soluble in water

pauco nuts Graine d'owala The fruits of *Pentaclethra macrophylla*, an African Leguminosae, which contains the alkaloid paucine

Pauli's principle Exclusion principle A theory which limits the number of electrons in a shell or orbit No two electrons can have, simultaneously, all four quantum numbers the same For the first two shells the values for the possible two and eight electrons are

	K shell		L shell							
n	1	1	2	2	2	2	2	2	2	2
l	0	0	0	0	1	1	1	1	1	1
m_l	0	0	0	0	−1	−1	0	0	1	1
m_s	$-\frac{1}{2}$	$+\frac{1}{2}$	$-\frac{1}{2}$	$+\frac{1}{2}$	$-\frac{1}{2}$	$+\frac{1}{2}$	$-\frac{1}{2}$	$+\frac{1}{2}$	$-\frac{1}{2}$	$+\frac{1}{2}$

where

n = principal quantum number (*energy level*)
l = azimutal quantum number (*translation*)
m_l = magnetic quantum number
m_s = equatorial quantum number (*spinning*)

Cf *correspondence principle* **P rule** The atomic nucleus has alternately odd and even numbers of alpha particles, hence the following transformation takes place by adding or subtracting

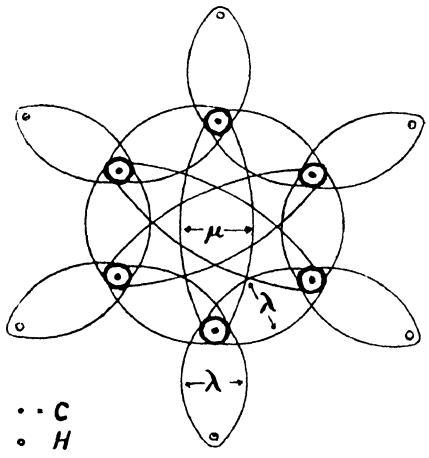
$$B^{11} \rightarrow C^{14} \text{ or } Be^{10}$$
$$B^{10} \rightarrow C^{13} \text{ or } Be^{9}$$

and the range of values is defined by

$l = 0, \quad , (n-1)$
$m_l = -l, -l-1, \quad 0, \quad l-1, l$
$m_s = -\frac{1}{2}$ and $+\frac{1}{2}$

where l is usually one unit lower than k of the old quantum theory

Pauling, Linus C 1901– An American chemist noted for work on molecular and atomic structure **P structure** A model of the benzene molecule based on an electronic conception of the inter-atomic bonds Each bond results from two electrons moving in



Pauling structure of benzene

orbits around the two nuclei of the atoms they join In the figure each curve represents the orbits of two electrons, the smaller orbits are called λ orbits, the larger μ orbits

paullinio tannin $C_{38}H_{36}O_{20}$ = 800 2 Guarana-tannin White crystals from the seeds of *Paullinia cupana*, a Sapindaceae of Brazil, the seeds are used similarly to cacao

pavemal The phenylethylbarbiturate of papaverine, used as a hypnotic

pavine $C_{20}H_{23}O_4N$ = 341 2 *2 4*-dihydropapaverine White needles m 201, soluble in chloroform, sparingly soluble in ether

Pavy's solution A modified Fehling's solution consisting of (A) 4 158 gm $CuSO_4$ in 500 cc water, and (B) 20 4 gm sodium potassium tartrate, 20 4 gm KOH, 300 cc strong NH_4OH, and water to make 500 cc Mix in equal parts Used for determining sugars, a solution of which is titrated into the boiling Pavy solution till the blue color vanishes Cuprous oxide is not precipitated as with ordinary Fehling's solution, q v

pawpaw The seeds of the edible fruit of *Asimina triloba* an Anonaceae of the eastern United States, used as an emetic, cf *papaw*

pay ore An ore, rock, earth, or gravel that can be worked with profit

Payen, Anselme 1795–1871 A French chemist noted for industrial processes (decolorizing with charcoal) and writings (*Course de Chimie*)

Payne's process Paynization A method of making wood fire-proof by successive treatments with ferrous sulfate and calcium chloride baths

paynize To treat wood according to Payne's process

payta Krameria

paytine $C_{21}H_{24}ON_2$ = 320 2 An alkaloid, m 156, from cinchona bark

Pb The symbol for lead

Pd The symbol for palladium

pe- A syllable in the names of chemical compounds which indicates a higher degree of saturation or of hydrogenation, as, collidine and copellidine, pyridine and piperidine

peach The fruit of *Prunus persica*, a Rosaceae, used as food **p aldehyde** γ-Undecalactone **p bark** The bark of p , used as a sedative **p kernel oil** The expressed oil of peach kernels A yellow liquid, d 0 915, m −15 saponification value 189–192, iodine value 93 5, insoluble in water, soluble in alcohol, ether, or chloroform Used as an adulterant for almond oil, and for flavoring **p leaves.** The dried leaves of the p tree, used as a diuretic and stimulant

peacock copper Bornite

peanut The edible seeds of *Arachis hypogaea*, a leguminous plant of the temperate zones **p hull meal** Ground p shells used as fertilizer, 1 5–2 5 % nitrogen **p oil** Arachis oil, ground-nut oil, earth-nut oil, oil of katchung A yellow oil expressed from peanuts, d 0 916, saponification value 188–196, iodine value 103–104, insoluble in water, soluble in alcohol, ether, chloroform or benzene Used as a substitute and adulterant of olive oil, and in the poorer grades of soap Cf *Bellier's test* *hypogaeic acid* **p. ore.** Wolframite

pear oil An alcoholic solution of amyl acetate, used in flavoring

pearl A calcareous secretion from various species of mollusks, chiefly the oyster **artificial-** (1) Culture p (2) Synthetic p **culture-** A natural pearl produced by artificial stimulation of the oyster, as, the insertion of a small grain of sand, watermite or worm **imitation-** An imitation of natural pearls that does not aim to produce the natural structure and composition, but only the outside appearance as alabaster coated with p essence **synthetic-** A pearl that has been made synthetically by slow precipitation from a gelatinous or albuminous solution of certain salts

p alum A specially prepared aluminum sulfate for paper manufacture **p ash** An impure calcined potassium carbonate **p essence** A product obtained from fish scales *e g*, of European minnow or herring, used to obtain a highly lustrous coating, as, on imitation pearls **p hardening** Gypsum used as a paper "filler" **p mica** Margarite **p opal** An opaque, bluish-white, lustrous variety of opal **p powder** A form of bismuth oxychloride, used as a cosmetic **p sinter** A modification of silica **p spar** Brown spar A dolomite with pearly luster **p stone** Perlite **p white** (1) Lithopone (2) Calcium sulfate for use in the paper industry (3) A form of bismuth subnitrate, $Bi(OH)_2NO_3$, used medicinally, and formerly as a cosmetic

pearlite Perlite

pearly Pearl like, having the appearance or luster of pearls

peastone Oolite

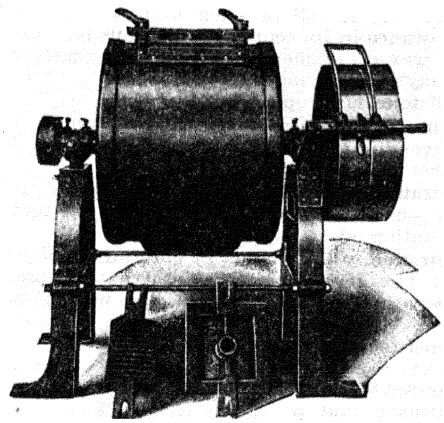
peat A dark, brown, amorphous soil produced by the decomposition of plants in moist places, especially in swamps It consists of carbon, hydrogen, and oxygen, used as fuel, and medicinally as a mud-bath, also as fertilizer Partly dried peat contains

Water	25 %
Ash	3 %
Woody fiber	50 %
Humus acids	22 %
Nitrogen	1 5–2 5 %

Cf. *dopplerite, ulmic acid, ulmin.* **p. coal.** A substance intermediate between peat and lignite; soft coal. **p. coke.** A carbonized peat, or peat charcoal produced by destructive distillation. **p. gas.** A hydrocarbon gas obtained by distillation of peat. **p. tar.** A tar obtained during the distillation of peat. **p. wax.** Mona wax. A black wax extracted by benzol or alcohol from peat; used as a substitute for montan wax in polishes.

pebble. A very small stone, worn round by the action of water. **Brazilian-** A rock-crystal or quartz, from which lenses are sometimes cut.

p. mill. A power-driven steel cylinder with a lining of porcelain, burr stone, iron or steel, and



Pebble mill.

ed a little less than half full with flint pebbles, porcelain or metal balls for pulverizing or mixing materials. Cf. *ball mill, mixer, agate mill.* **p. powder.** A gunpowder (see illustration) pressed into large cubical grains.

PeCe. A German trade name for the substance corresponding with nylon.

peck. Pk. A dry measure or unit of capacity in the British and United States systems: 1 peck = 0.25 bushel = 2 gallons.

pectase. A nitrogeneous ferment, occurring with pectose in fruits, that converts pectin into pectic acid; used to clarify fruit juices.

pectate. A salt of pectic acid.

pectenine. An alkaloid from the cactus, *Cereus poespitosus* or *Cereus pecten*, of Mexico. It is a tetanic poison.

pectic acid. $C_{17}H_{24}O_{18}$ = 484.2. A dibasic acid obtained from ripe fruits and vegetables. It forms a jelly with calcium salts, and the setting of jams and fruit preserves depends on this property. Pectic acid is formed from pectins by various enzymes, or by long boiling with dilute alkali. **para-** See *parapectic acid.*

pectinase. An enzyme that coagulates pectins by converting them to pectic acid.

pectinol. A commercial brand of pectase.

pectinose. Arabinose.

pectins. A group of compounds, formed from the protopectin of unripe fruits; its function in ripe fruits is for the cementation of individual cells. On hydrolysis it forms pectic acid in overripe fruits, which, in turn, gives the fruit juices the property of jelling.

pectization. Gelatinization or jellification.

pectize. To gelatinize.

pectocellulose. A substance from raw flax, which yields pectic acid and cellulose.

pectograph. The pattern obtained by the drying of colloidal solutions in a film on a glass plate.

pectography. The study of pectographs.

pectolinarigenin. $C_{13}H_{14}O_6$ = 314.1. *5.7*-dihydroxy-6.4′-dimethoxyflavone. Yellow needles, m.215, slightly soluble in alcohol. Cf. *pectolinarin.*

pectolinarin. $C_{29}H_{34}O_{15}$ = 622.3. A glucoside from the flowers of *Linaria vulgaris*, Linn., m.240 (decomp.), hydrolysed by acid to glucose, rhamnose and pectolinarigenin.

pectolite. Ratholite. A hydrated acid silicate of calcium and sodium, $4CaO.Na_2O.6SiO_2$, H_2O.

pectolysis. The clearing of fruit juices by the decomposition of pectin by pectase.

pectosase. An enzyme which separates the middle lamella of plants from the cell walls; cf. *pectase.*

pectose. A polysaccharide; the pulp of unripe fruits and vegetables, from which pectins are derived on ripening.

pectosinic acid. $C_{32}H_{23}O_{31}$ = 903.2. An amorphous acid substance derived from pectose by treatment with alkalis. It forms jelly-like amorphous salts, soluble in dilute acids.

pedesis. Brownian movement.

pedology. The science of the soil.

peganine. Vasicine.

peganite. Variscite.

Peganum harmala. The commonest weed of the Russian and Siberian steppes. Its seeds contain the two alkaloids, harmaline and harmine, which are used in the Orient in the preparation of a red dye, turkey-red.

pegmatite. Giant granite. An igneous rock which consists of coarse-grained mixtures of quartz, feldspar, muscovite, tourmaline, biotite, and other minerals. Some pegmatites contain lithia minerals, rare earth, tin, tungsten, tantalum, or uranium minerals, and are used as a source of these.

pegnin. A mixture of milk sugar and rennet; used medicinally in stomachic disturbances.

pegu catechu. Catechu.

pelagic. Pertaining to the deep sea; as, a pelagic deposit formed far from land at the bottom of the ocean. (Opposed to littoral.)

pelagite. The mineral, $xMnO_2,yFe_2O_3.2H_2O$.

pelargonaldehyde. $C_9H_{18}O$ = 142.1. Nonanal*, n-nonylicaldehyde, $C_8H_{17}CHO$, in citron oil; used in synthetic perfumes.

pelargone. *9*-Heptadecanone*.

pelargonic acid. $C_9H_{18}O_2$ = 158.2. Nonanoic acid*, n-nonoic acid, nondecylic acid, octane carboxylic acid, n-nonylic acid, $C_8H_{17}COOH$. An oxidation-product of oleic acid, and a constituent of oil of *Pelargonium roseum.* Colorless leaflets, d.0.91, m.12, b.253, soluble in water, alcohol or ether; used as a flavoring.

pelargonidin. $C_{15}H_{10}O_5.HCl$ = 306.53. An anthocyanidin (q.v.) from the flowers of *Pelargonium* species (Geraniaceae.)

pelargonin. Pelargonidin glucoside. An anthocyan from dahlia, geranium and other flowers. **p. chloride.** $C_{27}H_{31}O_{15}Cl.4H_2O$ = 702.7. A pigment closely allied to that from scarlet pelargonium.

pelargononitrile. Nonane nitrile*.

pelargonyl. Nonanoyl*. The radical $C_8H_{17}CO$—, from pelargonic acid. **p. chloride.** Nonanoyl chloride*.

pelidisi The ratio $10W/cm^3$, where W is the weight in grams and cm the sitting height of a person It is used in the calculation of normal diets

Péligot, Eugène Melchior 1811–1872 A French chemist noted for work on alcohols, sugars, uranium and chromium **P blue** A hydrated copper oxide, used as a pigment **P salt** Probably the potassium salt of the unknown chlorochromic acid, $K(CrO_3Cl)$, obtained by heating potassium dichromate with conc hydrochloric acid **P tube** A calcium chloride tube or U-tube with three bulbs, one in each arm, and one in the bend

pelitic Applied to rocks such as are or were originally, composed essentially of clay (*e g*, slate)

pellagra Lesions of the mucous membrane resulting from a deficiency of certain vitamins (q v)

Pelletan, Pierre 1782–1845 A French chemist noted for his *Dictionnaire de Chimie* (1821–1824)

Pelletier, Pierre Joseph 1788–1842 A French pharmacist who discovered toluene and several alkaloids (with Caventou) Cf *Peltier*

pelletierine $C_8H_{15}ON$ = 141 1 Punicine A pyrrolidine alkaloid obtained from the root bark of pomegranate, *Punica granatum* A brown, oily liquid, insoluble in water, soluble in alcohol or ether, used as anthelmintic **iso-** An alkaloid which occurs with pelletierine in the root bark of pomegranate **pseudo-** $C_9H_{15}ON$ = 153 2 Yellow crystals, soluble in water or alcohol

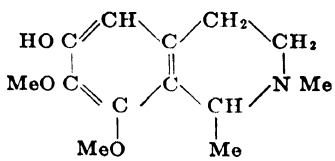
p hydrochloride A brown syrup, soluble in water, used medicinally **p sulfate** A brown syrupy liquid, soluble in water or alcohol, used as a teniacide **p tannate** A yellow-brown mass, slightly soluble in water, used as an anthelmintic

pellicle (1) A scum or thin skin, as, on the surface of a bacterial growth or the cortical layer of plants (2) The crust which forms over the surface of a saturated solution during evaporation

pellitory root Pyrethrum

pellote (Mex peyotl) Mescal buttons

pellotine $C_{13}H_{19}O_3N$ = 237 2 An alkaloid from pellote, the dried cactus *Anhalonium williamsi* of Mexico Colorless crystals, m 110, slightly soluble in water, used medicinally as a hypnotic



Cf *mescaline* **p hydrochloride** $C_{11}H_{13}ON(OMe)_2 HCl$ = 273 6 The hydrochloride of pellotine Colorless crystals, soluble in water, used as a hypnotic

pelopium A supposed element, isolated by Rose in 1846 from tantalite, and probably impure niobium

peloponium Columbium

pelosine Bebeerine

pelotherapy Treatment by the external application of natural products, as, mud, peat, etc

Peltier, Jean Charles Athanase 1785–1845 A French watch-maker and experimenter

P effect If a current is sent through a circuit containing a thermocouple, heat is given out at one junction, and absorbed at the other junction Thus it is the reverse of the thermo-electric current (cf *Kelvin-* and *Joule-effect*) **coefficient of-** The ratio of the quantity of heat applied to the quantity of electricity obtained from a thermocouple (Cf *Pelletier*)

pemphigus alcohol $C_{34}H_{70}O_2$ = 510 5 A solid, m 100–105, from the wax of the insect, *Pemphigus xylostei*

pemphygic acid $C_{34}H_{68}O_3$ = 524 5 An oxyacid, $C_{33}H_{66}(OH)COOH$, m 101, from the wax of the insect, *Pemphigus xylostei*

penatin Notatin

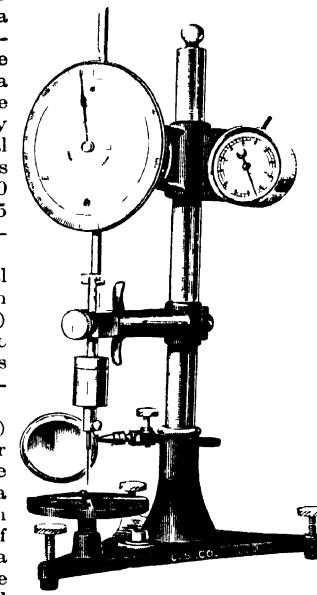
pencil (1) A roll or stick that contains some substance in its center, as, a litmus p, vaseline p, wax p, or menthol p (2) An aggregation of rays of light meeting in a point

pencilstone Pyrophyllite

pendulum A suspended disk or weight that moves to and fro, at a rate depending on fixed laws, used as a measure of time

penetrating Entering deeply or piercing under the surface **p odor** A strong, pungent or irritating odor

penetration (1) The act of entering or piercing (2) The distance in 0 1 mm, that a standard needle enters into a solid, like wax, paraffin etc (3) The consistency of a material expressed as the distance that a standard needle passes vertically into a material under conditions of loading (100 gm), time (5 sec) and temperature (25°C) (4) The focal distance or depth of a lens (5) The passage of radiations through materials, as, x-rays



Penetrometer

penetrometer (1) A device for measuring the hardness of a substance from the depth of penetration of a standard needle into the material to be tested, under a given load at definite temperature and in a certain time (see figure) (2) A device for measuring the penetrating powers of x-rays

penicillamine $C_5H_{11}O_4N HCl$ (?) An optically-inactive degradation-product of penicillin

penicillic acid $C_8H_{10}O_4$ = 170 1 An optically-inactive keto-methoxy hexenoic acid A fluorescent product of the mutarotation of penicillin, hexagonal plates m 175 (decomp), slightly soluble in water, produced by many *Penicillium* species

penicillin The active principle of the mold *Penicillium notatum* It has a selective bac-

teriostatic effect on certain Gram + bacteria in high dilutions **p -A** Notatin

penicilliopsin $C_{30}H_{24}O_8$ = 512 2 Mycoporphyrin A pigment obtained in orange needles, m 330, from the mycelia of molds

Penicillium A genus of Ascomycetes, fungi of the mildew group **p glaucum** Blue mould The common mould (*e g*, of bread) It excites alcoholic fermentation, and is used to effect a separation of d- and l-tartrates from racemic mixtures, since the d-isomer is acted on faster than the l-

pennine Penninite

penninite Pennine A green crystalline chlorite from the Pennines

pennone $C_9H_{18}O$ = 142 1 Tetramethyl pentanone $CMe_3 CMe_2 CO Me$ Colorless crystals, m 63, b 167

pennyroyal A popular name for (1) *Hedeoma pulegoides* of North America, (2) *Mentha pulegium* of Europe **p oil American-** The essential oil of *Hedeoma* species (Labiatae), d 0 920–0 935, containing pulegone and hedeomol **European-** The essential oil of *Mentha pulegium*, d 0 930–0 960

pennyweight (dwt) A unit of weight in the English system, 1 pennyweight = 24 grains = 0 05 troy ounce = 1 5552 grams 1 pennyweight of 24 k gold normally has a value of $1 0335 or 4 25 shillings (4^s 3^d)

Pensky-Martens apparatus An instrument for determining flash-points

pent(a)- A prefix derived from the Greek, indicating five

penta-amino- A prefix indicating the presence of five amino groups in an organic compound See *pentamino-*

penta-atomic Pentatomic

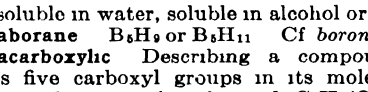
pentabasic Describing a compound that has five hydrogens which are replaceable by bases or metals

pentabromo- Describing a compound that has five bromine atoms in its molecule **p benzene** C_6HBr_5 = 472 6 Colorless needles, m 159, insoluble in water, soluble in alcohol or ether

pentaborane B_5H_9 or B_5H_{11} Cf *boron hydrides*

pentacarboxylic Describing a compound that has five carboxyl groups in its molecule, as, propinyl pentacarboxylic acid, $C_3H_3(COOH)_5$

pentacene $C_{22}H_{14}$ = 278 11 Benzo-[β]-naphthacene, β-1-dibenzoanthracene The hydrocarbon



pentacetate A mixture of amyl alcohol and amyl acetate (80 %), b 128–148

pentachloro Indicating a compound that has five chlorine atoms in its molecule **p aniline** $C_6Cl_5NH_2$ = 265 33 Colorless needles, m 232, soluble in alcohol or ether **p benzene** C_6HCl_5 = 250 3 Colorless needles, d 0 769 m 85, b 275, insoluble in water, soluble in ether or alcohol **p ethane** CCl_3CHCl_2 = 202 3 A colorless liquid, d 1 834, m −22, b 161, insoluble in water, soluble in alcohol or ether, used as a solvent

pentacid A base that contains five hydroxyl groups, and therefore is capable of neutralizing five hydrogen ions

pentacosane $C_{25}H_{52}$ = 352 4 A hydrocarbon from beeswax, m 54, insoluble in water

pentacosamic acid Cerebronic acid

pentacyclic Describing a molecule possessing five atomic rings, or a ring of five atoms

pentad Any element or radical having a valency of five

pentadecane* $C_{15}H_{32}$ = 212 3 Normal pentadecane A saturated aliphatic hydrocarbon A colorless liquid, d 0 769, m 10, b 270, insoluble in water, soluble in alcohol or ether It occurs in the oil from the rhizomes of *Kampheria galanga* **p carboxylic acid** Palmitic acid

pentadecanoic acid $C_{15}H_{30}O_2$ = 242 23 Isocetic acid, n-pentadecoic acid, n-pentadecylic acid, $C_{14}H_{29}COOH$ A colorless solid, m 54, d $_{100mm}$ 257, occurring in agaricus

pentadecanol* $C_{15}H_{31}OH$ = 228 25 Pentadecyl alcohol Colorless crystals, m 44

pentadecanone* $C_{15}H_{30}O$ = 226 23 A group of ketones, as **2-** or methyl tridecyl ketone **3-** or ethyl dodecyl ketone **8-** Diheptyl ketone, caprylone, $[Me(CH_2)_6]_2CO$ Colorless crystals, m 40, b 178, soluble in alcohol

pentadecyl The monovalent $C_{15}H_{31}$— radical derived from pentadecane **p alcohol** Pentadecanone

pentadiene* C_5H_8 = 68 06 **1 2-** Ethylallene, $CH_2 C CH CH_2 CH_3$ Colorless liquid, b 45 **1 3-** α-methyl bivinyl, piperylene, $CH_3 CH-CH CH CH_3$ Colorless liquid, d 0 696, b 43 **1 4-** $(CH_2 CH)_2CH_2$ Colorless liquid, d 0 6594, b 26 Cf *pentinene* **p carboxylic acid** Sorbic acid

pentadienone C_5H_6O = 82 05 Divinyl ketone, $(CH_2 CH)_2CO$ **diphenyl-** Styryl ketone

pentadigalloyl-glucose $C_{76}H_{52}O_{46}$ = 1700 4 A tannin from Chinese nut galls α- Light brown mass, soluble in water, β- less soluble in water

pentadiine C_5H_4 = 64 03 The diacetylene, HC C CH$_2$ C CH

pentaerythrite $C(CH_2OH)_4$ = 136 12 A liquid, m below −18, b 160 5

pentaerythritol $C_5H_{12}O_4$ = 136 12 An isomer of pentaerythrite, a colorless solid, m 253

pentaethylbenzene $C_{16}H_{26}$ = 218 2 C_6HEt_5 A colorless liquid, d 0 89, m −20, b 277, insoluble in water

pentagalloyl glucose $C_{41}H_{32}O_{26}$ = 940 2 A tannin occurring as a yellow mass, soluble in water

pentaglucose Pentose

pentaglycol $Me_2C(CH_2OH)_2$ = 104 12 A solid, m 129 b 206, soluble in water

pentahydro- A prefix indicating the presence of five hydrogen atoms, or five additional hydrogen atoms, as, pentahydropyrane

pentahydroxy- A prefix indicating the presence of five hydroxy groups **p benzene** $C_6H_6O_5$ = 158 0 The aromatic penta-atomic phenol $C_6H(OH)_5$ **p pentane** $C_5H_7(OH)_5$ = 152 12 A liquid, b 102

pentaiodo- A prefix indicating the presence of five iodine atoms in the molecule, as, pentaiodobenzene, C_6HI_5

pental C_5H_{10} = 70 1 Trimethylethylene, β-isoamylene, the unsaturated hydrocarbon, $Me_2C{=}CHMe$ A colorless liquid, d 0 678, b 38, insoluble in water, soluble in alcohol, ether or chloroform Used medicinally as a hypnotic and anesthetic, and in the manufacture of tert amyl alcohol

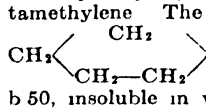
pentaline Pentachloroethane

pentamethyl- A prefix indicating the presence of five methyl groups in molecule **p benzene** $C_{11}H_{16}$ = 148 0 The aromatic hydrocarbon, C_6HMe_5 Colorless crystals, m 56, b 230,

insoluble in water **p benzoic acid** Me_5C_6COOH = 192 2 Colorless needles, m 210, soluble in water, alcohol or ether **p phenol** Me_5C_6OH = 164 1 Colorless needles, m 125, b 267, insoluble in water, soluble in alcohol

pentamethylen- A prefix indicating the presence of five methylene groups in a molecule

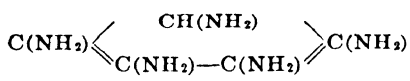
pentamethylene (1) The bivalent radical, $-CH_2(CH_2)_3CH_2-$ (2) C_5H_{10} = 70 1 Tetrahydrocyclopenten, cyclopentane, cyclopentamethylene The saturated ring compound,



A colorless liquid, b 50, insoluble in water, soluble in alcohol or ether It is a constituent of Russian and Caucasian petroleums **hydroxy-** Cyclopentanol* **keto-** Cyclopentanol*

p amine Piperidine **p bromide** *1 5*-Dibromopentane **p diamine** Cadaverine **p oxide** Tetrahydropyran

pentamino- A prefix indicating the presence of five amino groups in the molecule **p benzene** $C_6H(NH_2)_5$ = 153 1 Colorless needles, soluble in water, insoluble in alcohol or ether **p pentol** $C_5H_{11}N_5$ = 141 1 Pentamino-cyclopentadien



pentane* C_5H_{12} = 72 12 Amylhydride A saturated hydrocarbon of the methane series A colorless liquid, d 0 634 b 36 2, insoluble in water, soluble in alcohol or ether Used as an anesthetic, in refrigeration, and for filling thermometers **iso-** Secondary- Dimethyl ethyl methane, *1 1 2*-trimethyl ethane, Me_2CHCH_2Me A colorless liquid, b 30, d 0 622 **normal-** Pentane **secondary-** Iso- **tertiary-** CMe_4, tetramethylmethane A colorless liquid or gas, b 10, a constituent of coal oil and gas **amino-** Amylamine **bromo-*** Amyl bromide **chloro-*** Amyl chloride **ethoxy-*** Amyl ethyl ether **iodo-*** Amyl iodide **methoxy-*** Amyl methyl ether **tetrahydro-** Cyclopentane

p carboxylic acid Caproic acid **p -diamine, 1 5-** Cadaverine **p dicarboxylic acid*** Pimelic acid **p dioic acid*** Glutaric acid **p dioic acid** Glutaric acid **p dione*** Acetylacetone **p lamp** A source of illumination in photometric work Cf *Harcourt lamp* **p thermometer** A capillary filled with colored pentane, used as a thermometer for low temperatures

pentanediol* $C_5H_{12}O_2$ = 104 09 **1 2-** α-n-Amylene glycol, $Me(CH_2)_2CHOH\ CH_2OH$ Colorless liquid, d 0 980, b 212 **1 4-** γ-Pentyleneglycol, $MeCHOH(CH_2)_2CH_2OH$ Colorless liquid, d 0 9954, b $_{20mm}$131 **1 5-** Pentamethylene glycol $CH_2OH(CH_2)_3CH_2OH$ An oily liquid, d 0 994, b 239 **2 3-** Methyl ethylethylene glycol, β-n-amylene glycol, $MeCH_2(CHOH)_2Me$ Colorless liquid, d 0 9945, b 187

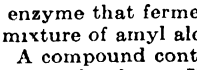
pentanethiol* $C_5H_{12}S$ = 104 15 Amylmercaptan, $Me(CH_2)_4SH$ A colorless liquid, d 0 857, m −76, b 126, insoluble in water

pentanoic acid* Valeric acid **γ-keto-** Levulinic acid

pentanol* Amyl alcohol

pentanone* A ketone derived from pentane, as *2*-pentanone (*methyl propyl ketone*), 3-pentanone (*diethylketone*) **phenyl-** Butylphenylketone **tetramethyl-** Pennone

pentarsenole As_5H = 375 9



pentase An enzyme that ferments pentoses

pentasol A mixture of amyl alcohols, b 116–136

pentasulfide A compound containing five atoms of sulfur in the molecule, as, K_2S_5 or Et_2S_5

pentatomic Describing (1) A molecule that consists of five atoms (2) A ring compound that has five atoms in the ring, as, cyclopentane (3) An acid that has five replaceable hydrogen atoms (4) A base, alcohol, or phenol that has five hydroxyl groups

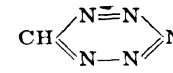
pentatriacontane* $C_{35}H_{72}$ = 492 56 The hydrocarbon $Me(CH_2)_{33}Me$ White crystals, d 0 782, m 75, b $_{15mm}$331

pentavalent An atom or group of atoms that has a valency of five

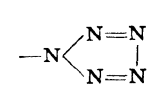
pentazane Pyrrolidine

pentazdiene A compound derived from HN N - NH N NH

pentazine CHN_5 = 83 3 The heterocyclic compound,



pentazyl The monovalent radical,



pentene* (1) Amylene (2) Cyclopentane

pentenedioic acid Glutaconic acid

pentenic acid $C_5H_8O_2$ = 100 06 Pentenoic acid* **1 2-** or α- Propylideneacetic acid, γ-methylcrotonic acid $EtCH\ CHCOOH$ A colorless liquid, d 0 990, m 10, b 201 **2 3-** or β- Ethylidenepropionic acid, $MeCH\ CH\ CH_2COOH$ A colorless liquid, d 0 987, b 194 **3 4-** or γ- Allylacetic acid, $CH_2\ CH(CH_2)_2COOH$ A colorless liquid, d 0 984 m −18, b 189 **1-** See *angelic, senecioic* and *tiglic* acid **dimethyl-** *Teracrylic acid* **methyl-** See *pyroterebic acid*

pentenoic acid* Pentenic acid

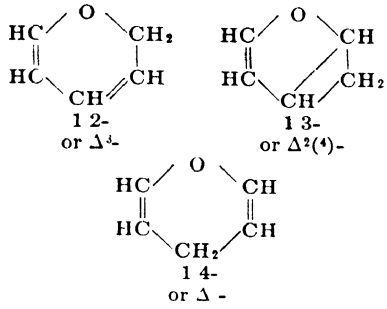
pentenol* $C_5H_{10}O$ = 86 06 A group of unsaturated alcohols **1-p -3** *1*-Penten-*3*-ol, ethylvinylcarbinol, $CH_2\ CH\ CHOH\ CH_2\ Me$ Colorless liquid, d 0 840, b 114 **3-p -2** Dimethylpropenylcarbinol, $Me\ CHOH\ CH\ CH\text{-}Me$ Colorless liquid, d 0 834, b 112 **4-p -1** β-Allylethylalcohol, $CH_2OH(CH_2)_2CH\ CH_2$ A liquid, d 0 863, b 140 **4-p -2** Allylmethylcarbinol, $Me\ CHOH\ CH_2\ CH\ CH_2$ A liquid, d 0 834, b 116

pentenyl Describing a series of radicals derived from amylene, as,

Δ^1- $\rightarrow CH\ CH(CH_2)_2Me$
Δ^2- $-CH_2CH\ CHCH_2Me$

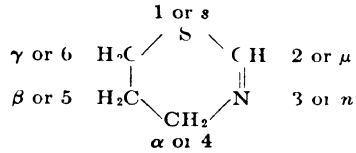
pentevalent Pentavalent

pentfurane C_5H_5O = 81 1 The heterocyclic compounds



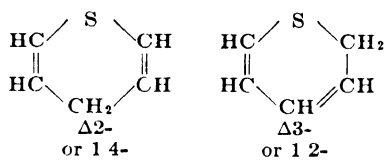
1 2- or Δ^{3}- 1 3- or $\Delta^{2(4)}$- 1 4- or Δ -

penthiazoline C_4H_7SN = 101 1 The heterocyclic compound



penthiofurane Penthiophene

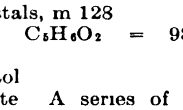
penthiophene C_5H_6S = 98 0 Penthiofurane The heterocyclic compounds



pentine Pentyne* **p dioic acid** Glutinic acid

pentinene C_5H_8 = 68 07 A diolefine Me C - C CH_2, isomeric with valerylene, piperylene and pentadiene

pentinic acid $C_6H_8O_3$ = 128 1 α-ethyltetronic acid



Colorless crystals, m 128

pentinoic acid $C_5H_6O_2$ = 98 1 MeCH C - CCOOH

pentite Pentitol

pentitol Pentite A series of five pentatomic alcohols $CH_2OH(CHOH)_3CH_2OH$, derived from the pentoses, two are optically-active See *adonite, arabite, xylite* **methyl-** Rhamnite

pentlandite A native iron and nickel sulfide (Fe Ni)S

pentobarbital $C_{11}H_{18}N_2O_3$ = 226 1 Nembutal ethyl-*1*-methylbutyl-barbituric acid White crystals, m 128–130, used as a hypnotic

pentoic acid Valeric acid

pentol Cyclopentadiene

pentonic acid A series of pentavalent monobasic acids of the type, $CH_2OH(CHOH)_3COOH$ See *arabonic, ribonic, xylonic acids*

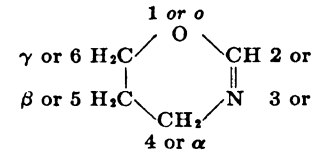
pentosans A group of gums or resins (*hemi-* or *pseudocelluloses*) which are hydrolysed to pentoses, as, araban, xylan They are constituents of cell membranes of plants, and occur in straw, wood, coffee and chocolate **methyl-** Gums which yield methylpentoses on hydrolysis

pentose Pentaglucose A monosaccharide or sugar containing five carbon atoms, $C_5H_{10}O_5$ They are not fermented by yeast See *arabinose, lyxose, ribose, xylose* **methyl-** See *rhamnose, rhodeose, fucose*

pentoside A nuclein in some proteins of the general composition $A\,OP(OH)O_2\,B$, where A is a purine body and B a pentose, e g guanosin

pentoxazol 1 3[4]-Oxazine

pentoxazoline C_4H_7ON = 85 1 The heterocyclic ring compound,



phen- Phenpentoxazoline

pentoxide A binary compound which contains five atoms of oxygen, as nitrogen pentoxide, N_2O_5

pentoxime $C_5H_5O_5N_5$ = 215 2 A homolog of fulminuric acid, the cyclic compound, C NOH—C NOH / C NOH—C NOH > C NOH, it contains five oxime groups

pentrite $C_5H_8N_4O_{12}$ = 316 0 Tetranitroerythrite, $C(CH_2O\,NO_2)_4$ A high explosive

penturonic acid $C_5H_8O_6$ = 164 0 Any trihydroxy aldehyde acid, $CHO(CHOH)_3COOH$, derived from pentoses Cf *uronic acids*

pentyl Amyl **p acetate** Amyl acetate **p amine** Amylamine

pentylene Pentadiene

pentylidene Amylidene

pentyne* C_5H_8 = 68 06 **1-** *n*-Pentine, propylacetylene HC C$(CH_2)_2$Me A colorless liquid, d 0 722, m −95, b 40 **2-** Ethylmethylacetylene, 2-pentine, Me C C Et A liquid, d 0 687, m −101, b 56 **p dioic acid** Glutinic acid

Penzold's reagent A solution of diazobenzosulfuric acid and potassium hydroxide, used as a reagent for sugar in urine

peonin Aurine

peonine An alkaloid from the rhizome of peony, *Paeonia officinalis*, a Ranunculaceae, used medicinally as an antispasmodic

peonol $C_9H_{10}O_3$ = 166 1 An aromatic ketone from the root of *Paeonia montana*, a Japanese plant, colorless, long needles, of pleasant aromatic odor, m 50

pepo Pumpkin-seed

pepper Piper The dried fruit of *Piper* species **black-** The dried unripe fruits of *Piper nigrum*, a Piperaceae of tropical countries It contains piperine, chavicine, essential oils and a resin, and is used as a condiment and in the manufacture of pepper oil **cayenne-** Red p **long-** The dried, unripe fruit of *P longum*, used as carminative and stimulant **Jamaica-** Pimenta **red-** The dried and ground unripe fruits of *Capsicum frutescens*, a Solanaceae It contains an oleoresin, used as a condiment and medicinally **Spanish-** Red p **white-** A black pepper that has been deprived of the black outer skin of the seeds, it is milder than black pepper **wild-** Mezereon

p oil An oil extracted from the fruits of *Piper nigrum* A pale yellow liquid, d 0 87–0 91, insoluble in water, soluble in alcohol or ether It contains cadinene, phellandrene, and dipentene

peppermint Mentha piperita The dried leaves and flowering tops of *Mentha piperita*, a Labiatae of temperate zones Used medicinally as the fluid extract, for flavoring, and in the manufacture of peppermint oil and menthol **p camphor** Menthol **p oil** An essential oil obtained by distilling peppermint A colorless liquid of strong agreeable odor, d 0 91, insoluble in water soluble in alcohol, ether, or chloroform It contains 50–90 % menthol Grades American, Chinese, English, Italian, Japanese, and Spanish, used for flavoring, medicinally as a stimulant and antispasmodic, and in perfumery

pepsase Pepsin

pepsin Pepsase Acid-proteinase An enzyme of gastric juice that hydrolyses proteins to proteases, peptones, and peptides, preferably in acid (HCl) solution It is obtained from the fresh stomachs of healthy pigs, as fine, amorphous, white powder or grains, slightly hygroscopic and partly soluble in water, soluble in very dilute HCl, insoluble in alcohol One part of pepsin should be able to digest not less than 3000 parts of freshly-coagulated egg-albumen, used medicinally as a digestive **vegetable-** Papain

pepsinate To mix with pepsin

pepsinogen The mother substance or zymogen of pepsin in the cells of the stomach glands

peptide A compound of aminoacids, see *polypeptide* **p group** The bivalent radical —CO NH—

peptization The liquefaction of a gel to a sol, the change from a jelly to a liquid

peptizator An agent that causes the liquefaction of a gel

peptize To dissolve or liquefy a jelly or gel

peptolysis The hydrolysis of peptone to aminoacids

peptolytic An agent that splits peptones

peptone A group of simple proteins, soluble in water and able to diffuse through parchment They are not coagulated by heat, and are formed by the action of pepsin on albuminous bodies Cf *gastric digestion* Chemically the peptones are a mixture of proteoses and amino acids which resemble polypeptides **beef-** Meat **p casein-** Milk **p gelatin-** A peptone obtained by digestion of gelatin **meta-** A digestion-product of peptones **milk-** A light-brown powder obtained by digestion of casein, soluble in water, and used as nutrient for convalescents **meat-** An extract made from fresh, lean beef and treated with the digestive juices of the pancreas 1 gm represents 10 gm of lean beef A brown powder, soluble in water, used as a nutrient and in bacteriology for culture media **para-** Syntonin **silk-** A peptone obtained from silk, and used in biochemical tests **true-** Tryptone

peptonization The process of converting proteins into peptones

peptonize To change into peptone

peptonizing powder Pancreatin powder **p tube** A parchment tube used for dialyzing proteins

peptotoxine A ptomaine from decomposing proteins

per- A prefix derived from the Latin "per" meaning through, and indicating (1) "very" or more than ordinary, as, peracidity, (2) "above" or "beyond," as, permanganate It denotes an indefinitely large amount of the substance or radical to which it refers

peracetic acid $C_2H_4O_3$ = 76 03 Me CO O OH, an isomer of methyl acid carbonate, $MeHCO_3$

peracid, per- -acid (1) A member of a group of inorganic acids containing oxygen in the form of peroxide, or an element in its highest valency, as, perboric acid, persulfuric acid, perchloric acid, permanganic acid (2) Organic peracids Organic acids in which the radical, —CO O OH, is assumed to exist True peracids give H_2O_2 with dilute sulfuric acid, and sometimes ozone with concentrated sulfuric acid They are sometimes confused with acids containing "hydrogen peroxide of crystallization" Cf *peri-acid*

peracidity Excessive acidity

peractivin Trade name for p-toluene sulfomonochloride, used as mild oxidant in textile bleaching

perborate A salt of a perboric acid containing the BO_3^- or $B_4O_8^-$ radicals In general they are oxidizing agents resembling hydrogen peroxide, and are used for bleaching, cleaning, and disinfecting **meta p** A salt of the type MBO_3

perboric acid The hypothetical acid, HBO_3, from which perborates are derived This is actually meta perboric acid, perboric acid being the acid of the salt $Na_2B_4O_8,10H_2O$

perbunan Trade name for a co-polymer of butadiene and styrene, related to buna, q v

perbutan Trade name for a co-polymer of butadiene and acrylic nitrile, related to buna, q v

percaine $C_{19}H_{28}O_2N_3$ = 330 22 α-butyl-oxy-cinchoninic acid, diethyl-ethylenediamide, nupercaine Colorless crystals, m 97, soluble in water or alcohol, used as a spinal analgesic

percarbide A binary compound of carbon containing an excess of carbon

percarbonate A salt of the hypothetical percarbonic acid containing the divalent radical, $C_2O_6^{--}$ They decompose in aqueous solution to hydrogen peroxide and carbonates

percarbonic acid The hypothetical acid, $H_2C_2O_6$, from which the percarbonates are derived

percentage Parts in a hundred parts, as, 6 % means 6 parts in 100 parts, 6 grams in 100 grams, or 6 pounds in 100 pounds The percentages of the constituents of a compound can be calculated from the formula of the compound Let the symbols represent the atomic weights, and M the molecular weights, then the percentage can be found for NaCl by Na + Cl = M, 23 + 35 5 = 58 5 Hence, in 58 5 parts of salt there are 23 parts of sodium and 35 5 parts of chlorine In 100 parts therefore

58 5 23 100 x (x % Na = 39 4 %)

58 5 35 5 100 y (y % Cl = 60 6 %)

perch Rod

perchlorate A salt of perchloric acid containing the ClO_4^- radical

perchlorethane Hexachlorethane

perchlorether $(C_2Cl_5)_2O$ = 418 6 Decachlorethylether Colorless scales, d 1 90, m 69, decomp by heat

perchlorethylene Tetrachlorethylene

perchloric acid $HClO_4$ = 100 5 A monobasic acid of heptavalent chlorine, its highest state of oxidation, d_{22° 1 76, m −35, b 60_{mm} 39 A colorless liquid, d 1 12, which contains 20 % $HClO_4$ in water Used as an oxidizing agent, in electro-analysis, for the destruction of organic material, and as a reagent for potassium **p anhydride** Chlorine heptoxide, Cl_2O_7 **p ether** Ethylperchlorate **p hydrate** $HClO_4, H_2O$ = 118 49 An explosive solid, m 50 **p dihydrate** $HClO_4, 2H_2O$ = 136 51 A liquid, b 203, used as an oxidizing agent (72 4 % p acid)

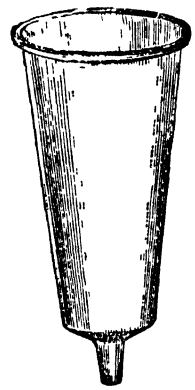
perchloride A chloride that contains more chlorine than the corresponding normal chloride

perchromate One of the intensely colored salts derived from perchromic acid There are two series of salts of the general types $MCrO_5$ (deep blue) and M_3CrO_8 (deep orange-brown) They are rapidly decomposed in aqueous solution, but more stable in ether

perchromic acid $HCrO_3$ = 101 1 and H_3CrO_8, $2H_2O$ or $(OH)_4Cr(O\,OH)_3$ = 219 06 Two acids containing heptavalent chromium, formed by the addition of hydrogen peroxide to a chromate solution (blue color), decomp rapidly Below −15°C the H_3CrO_8 forms deep blue crystals

percin A ptomaine from perch and pike, containing 78 % arginine

percolate (1) To strain or pass through fine interstices, as, water percolates through stone To extract the soluble matter from drugs by the passage of water through the powdered drug (2) The solution obtained by percolation



Percolator

percolater Percolator

percolation The process of extracting the soluble constituents of a substance by a slow stream of solvent Generally used in the extraction of drugs that are ground and packed into the percolator the height of the powder should be three times its diameter

percolator A conical, long glass vessel, with tubulated bottom used for the extraction of drugs **p bottle** A wide-mouthed graduated bottle in which the percolate is collected

percrystallization The crystallization of a solute from a solution dialyzing through a membrane (such as collodion)

percussion The act of striking a sharp blow **p cap** A detonator or primer **p figure** Strike figure The radiating lines formed in certain minerals by striking them with a sharp hammer **p powder** Fulminating powder An explosive that ignites by percussion

perdistillation Distillation through a dialyzing membrane Cf *pervaporation*

pereira Pareira

pereirine $C_{19}H_{24}ON_2$ = 296 2 Pareirine An alkaloid from the root of *Geissospermum laeve*, a tree of tropical America that yields the pereiro bark A brown amorphous powder, m 119, insoluble in water, soluble in alcohol or ether, used as a quinine substitute Cf *geissine, vellosine*

pereiro bark The bark of *Geissospermum laeve*, a tree of tropical America, used medicinally as a tonic and antipyretic

perezol A 0 5 % alcoholic solution of pipitzahoic acid Used as an indicator in volumetric analysis, acids, colorless, alkalis, deep orange

perezon Pipitzahoic acid

perferrate (1) A misnomer for ferrate, M_2FeO_4 (2) An intensely green-colored unstable compound of hepta- or octa-valent iron, $MFeO_4$

perforated plate A porcelain plate with small holes, usually inserted in a funnel and covered with filter paper for the rapid filtration of solutions

perfringen The gas-gangrene antitoxin

perfume A volatile fragrant substance resembling in odor a flower, blossom, herb, or other odoriferous substance It may be classified as (a) *natural*, if obtained by extraction of flower, blossom, or plant, (b) *artificial*, if a mixture of natural oils or oil constituents, (c) *synthetic*, if a mixture of synthetically produced substances Cp *essential oils, odors, terpenes, flavors*

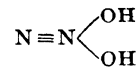
perfusion The passage of a fluid through spaces

pergamyn An artificial parchment paper (German)

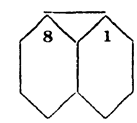
pergenol Solid hydrogen peroxide A mixture of sodium perborate and bitartrate which, with water, gives hydrogen peroxide

perhydrate (1) Ortizon (2) Peroxy-hydrate

perhydrol (1) A 30 % solution of hydrogen peroxide, ten times stronger than the ordinary solution It is known as "100 volumes" or (inaccurately) as "100 %" hydrogen peroxide (q v), because it evolves 100 times its volume of O_2 (2) A supposed combination of two hydroxyl groups with an inert element or compound, as,



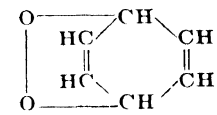
peri- *π* A prefix derived from the Greek "about" or 'around," meaning around **p acid** *1*-Naphthylamine-*8*-sulfonic acid **p bridge** A bond between the first and eighth carbon atom of naphthalene **p position** The *1 8*-position of the naphthalene ring



periclase A native magnesium oxide, MgO, which occurs in aggregates of small cubes

pericline Albite

pericyclo A bond or valency that extends partly around a ring, as,



peridote A variety of olivine used as a gem

peridotites A group of crystalline, igneous rocks, of which olivine is the chief constituent

perigee The point in the moon's orbit at which it is nearest the earth, (cf *apogee*)

perihelion The point of the orbit of a heavenly body at which it is nearest to the sun, cf *aphelion* Applied to the electron in its relation to the nucleus

perikinetic Concerning Brownian motion Cf *orthokinetic*

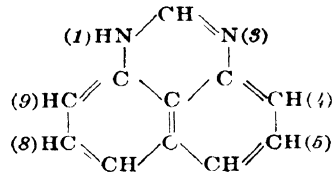
perilla alcohol $C_{10}H_{16}O_4$ = 200 12 A colorless solid from palmarosa and naal oils Cf *perilla*

perillaldehyde $C_{10}H_{14}O$ = 150 0 $C_6H_8CMe\text{-}CH_2CHO$ Cf *peryllartine*

perilogic series The allologic series of pyrene $C_{10}H_8$, $C_{16}H_{10}$, $C_{22}H_{12}$, etc

perimeter The sum of the lengths of the bounding lines of a figure

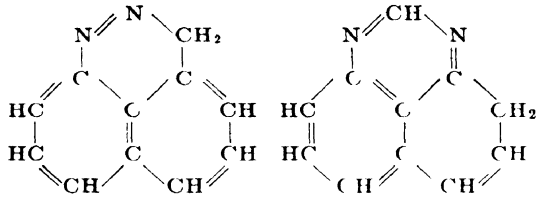
perimidine $C_{11}H_8N_2$ = 168 1 The heterocyclic compound,



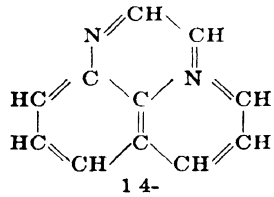
perimidyl A group of eight isomeric radicals, $C_{11}H_7N_2$—, derived from perimidine

perimorph A mineral that encloses another mineral The antonym of *endomorph*

perinaphthodiazine $C_{12}H_8N_2$ = 180 1 N-naphthodiazine A group of isomers of naphthodiazine and naphthisodiazine

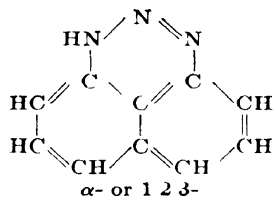


1 2- 1 3-

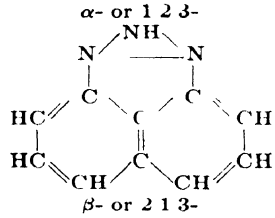


1 4-

perinaphthotriazole $C_{10}H_7N_3$ = 169 2 ¶ π-Naphthotriazole A series of compounds isomeric with naphthotriazole and naphtisotriazole



α- or 1 2 3-



β- or 2 1 3-

period (1) A regular interval or division, (as a period of time) elapsing between a regularly-recurring phenomenon (2) A period of elements in the periodic system, q v (3) A family of closely-related elements with consecutive atomic numbers, as, 24 Cr — 29 Cu, or 59 Pr — 71 Lu (4) A geologic measure See *geologic era* **damping-** See *damping-* **decay-** See *period of decay* **gold-** The elements Os, Ir, Pt, Au **half-, half life-** See *p of decay* **incubating-** The time necessary for the full development of a bacterial culture **iron-** Iron family The elements Mn, Fe, Co, Ni, forming the central portion of the third period of the periodic system **life-** (1) Period of decay (2) The time during which an atom or molecule is in the activated or excited state See *damping lingering p* **long-** The 3rd, 4th, or 5th p of t periodic system **platinum-** The elements (Ir, Pt, Au, and Hg, form a part of the fifth peri of the periodic system **rare earth-** The e ments with atomic numbers 58–72, cerium hafnium, form the central part of the fifth peri of the periodic system **short-** Either of t 1st or 2nd p of the periodic system **silve** The elements Ru, Rh, Pd, Ag, and Cd form t central part of the fourth period of the perioc system **transitional-** (1) One of the trios transitional elements, q v , of the eighth perioc group (2) One of the three series of elemen from Ti to Ni, Zr to Pd or Hf to Au **uraniur** The sixth period of the periodic system, whi consists of the radioactive elements

period of decay The time required for the d integration of one-half of a quantity of a radi active element into its next transmutati product, see *radioactive element* (table)

periodate A salt of periodic acid which contai the IO_4^- radical

periodic (1) Pertaining to a regularly-recurri event phenomenon, or characteristic (2) Pe taining to the highest valency of iodine, as *acid* **p acid** $HIO_4\,2H_2O$ or H_5IO_6 = 228 Colorless monoclinic crystals, m 130, decom 140, soluble in water Its salts are the peri dates **p chain** An arrangement of the oxyg cal elements according to increasing atomic weights or numbers in a continuous sequence It can be divided into six sections (periods each of these again subdivided (sub-period- If the valencies of each element are plot against the atomic weights a characteristic cu- is produced In the table shown this arran ment is used to indicate the electronic structu of the atoms Cf *ionic number* **p law** (Mendeleeff law The properties of the elemen change periodically when the elements a arranged in increasing order of atomic numbe (2) Moseley's law The properties of the e ments are a periodic function of their atom numbers as illustrated in the p chain, p spir p system, and p table **p precipitatic** *Liesegang rings* **p properties** Those prop ties of elements, which when plotted again their atomic weights show the relationship of t elements as exemplified in the periodic tab They include, valency, atomic volumes, atom heats, wavelengths of x-ray spectra, compres bilities **p spiral** Helix Chemica A graph cal representation of the periodic system in t form of a curve, which illustrates the relationsh of elements (see figure) **p system** A natur classification of all elements into one syste from which their properties can be deduced a unknown elements and their properties pr dicted There are 92 elements from hydrog to uranium (inclusive) The periodic syste can be represented in various ways uni-dime sionally, in the form of a chain (see *period chain*), two-dimensionally, as a spiral or helix which the chain is bent so that elements wi similar properties come together, three-dime sionally, as a spatial model Besides the graphical representations there are vario tables and charts which express one or more the features of the periodic system **p tab** An arrangement of the periodic system as a tab which was developed independently in 1869 D Mendeleeff and in 1870, by Lothar Meyer an in a crude form, by Newlands, q v

periodicity (1) The occurrence of a phenomenon at regularly-recurring intervals, as of time See *periodic properties* (2) The occurrence of similar properties in a group of chemical elements in the periodic system

peripheral Situated near or at the surface, or on the circumference of a curvilinear figure

periphery The surface or outer part, in particular, the circumference

periplocin $C_{30}H_{48}O_{12}$ = 600 5 A glucoside from the bark of *Periploca graeca*, an Asclepiadaceae A yellow amorphous powder, m 205, soluble in water or alcohol, used medicinally as a heart tonic

periplogenin $C_{23}H_{34}O_5$ = 390 2 The aglucone of periplocin similar in structure to strophanthidin, but having a CH_3 group instead of CHO See *cholane derivatives*

periscope Altiscope An arrangement of lenses and mirrors which enables an observer to see over intervening obstacles without being seen himself

periscopic Applied to lenses having a concave-convex surface, like a meniscus

perisphere The "atmosphere" surrounding a molecule, ion, or radical in which it makes its influence felt Cf *molecular diagram*

peristalsis The rhythmic contractions of the intestines by which their contents are propelled through, mixed with digestive enzymes, and partly absorbed

THE PERIODIC CHAIN

Periods	At No	Name	Electrons in orbits K L M N O P	Valence or polar numbers − (5) +
(1)	(2)	(3)	(4)	
	1	Hydrogen	1	1 H 1*
	2	Helium	2 0	He
Ia	3	Lithium	2 1	Li 1*
	4	Beryllium	2 2	Be 2*
	5	Boron	2 3	3 B 3*
t	6	Carbon	2 4	4 C 4*
	7	Nitrogen	2 5	3* 1 N 1 2 3 4 5
	8	Oxygen	2 6	2* O
Ib	9	Fluorine	2 7	1*F
T	10	Neon	2 8 0	Ne
IIa	11	Sodium	2 8 1	Na 1*
	12	Magnesium	2 8 2	Mg 2*
	13	Aluminum	2 8 3	Al 3*
t	14	Silicon	2 8 4	4 Si 4*
	15	Phosphorus	2 8 5	3* P 1 3 4 5
	16	Sulfur	2 8 6	2* S 2 4 6
IIb	17	Chlorine	2 8 7	1*Cl 1 3 5 7
T	18	Argon	2 8 8 0	A
IIIa	19	Potassium	2 8 8 1	K 1*
	20	Calcium	2 8 8 2	Ca 2*
	21	Scandium	2 8 8 3	Sc 2 3*
t	22	Titanium	2 8 8 4	Ti 2 3 4*
	23	Vanadium	2 8 10 3	V 2 3*4 5
	24	Chromium	2 8 11 3	Cr 2 3*4 6
	25	Manganese	2 8 13 2	Mn 2*3 4 6 7
	26	Iron	2 8 13 3	Fe 2 3* 6 7
III′	27	Cobalt	2 8 15 2	Co 2*3 4
	28	Nickel	2 8 16 2	Ni 2*3
	29	Copper	2 8 17 2	Cu 1 2*
	30	Zinc	2 8 18 2	Zn 2*
	31	Gallium	2 8 18 3	Ga 3*
t	32	Germanium	2 8 18 4	4 Ge 4*
	33	Arsenic	2 8 18 5	3* As 1 3 5
	34	Selenium	2 8 18 6	2* Se 2 4 6
IIIb	35	Bromine	2 8 18 7	1*Br 1 3 5 7
T	36	Krypton	2 8 18 8 0	Kr
IVa	37	Rubidium	2 8 18 8 1	Rb 1*
	38	Strontium	2 8 18 8 2	Sr 2*
	39	Yttrium	2 8 18 8 3	Y 2 3*
t	40	Zirconium	2 8 18 8 4	Zr 2 3 4*
	41	Columbium	2 8 18 10 3	Cb 2 3*4 5
	42	Molybdenum	2 8 18 10 4	Mo 2 3 4*5 6
	43	Masurium	2 8 18 12 3	Ma 2 3*4 6 7
	44	Ruthenium	2 8 18 12 4	Ru 2 3 4* 6 7 8

THE PERIODIC CHAIN—(*Continued*)

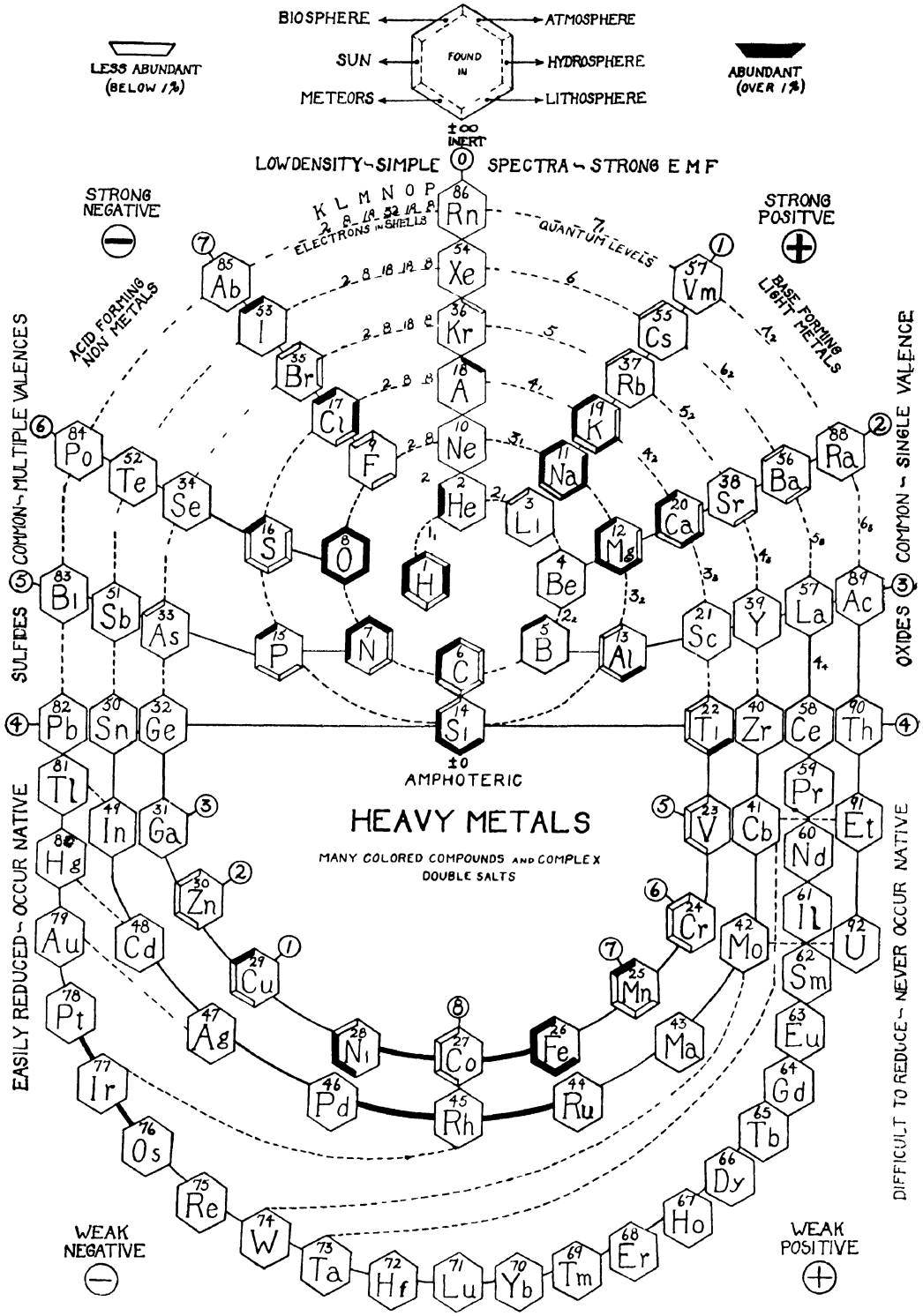
Periods	At No	Name	Electrons in orbits K L M N O P Q	Valence or polar numbers − (5) +
(1)	(2)	(3)	(4)	(5)
IV′	45	Rhodium	2 8 18 14 3	Rh 2 3*4 6
	46	Palladium	2 8 18 16 2	Pd 2* 4
	47	Silver	2 8 18 18 1	Ag 1*2
	48	Cadmium	2 8 18 18 2	Cd 2*
	49	Indium	2 8 18 18 3	In 3*
t	50	Tin	2 8 18 18 4	4 Sn 2 4*
	51	Antimony	2 8 18 18 5	3 Sb 3 5*
	52	Tellurium	2 8 18 18 6	2* Te 4 6
IVb	53	Iodine	2 8 18 18 7	1*I 3 5 7
T	54	Xenon	2 8 18 18 8 0	Xe
Va	55	Cesium	2 8 18 18 8 1	Cs 1*
	56	Barium	2 8 18 18 8 2	Ba 2*
	57	Lanthanum	2 8 18 18 8 3	La 2 3*
t	58	Cerium	2 8 18 18 8 4	Ce 2 3 4*
	59	Praseodymium	2 8 18 20 8 3	Pr 2 3*
	60	Neodymium	2 8 18 21 8 3	Nd 2 3
	61	Illinium	2 8 18 22 8 3	Il 2 3
	62	Samarium	2 8 18 23 8 3	Sm 2 3
	63	Europium	2 8 18 24 8 3	Eu 2 3
	64	Gadolinium	2 8 18 25 8 3	Gd 2 3
V″	65	Terbium	2 8 18 26 8 3	Tb 2 3
	66	Dysprosium	2 8 18 27 8 3	Dy 2 3
	67	Holmium	2 8 18 28 8 3	Ho 2 3
	68	Erbium	2 8 18 29 8 3	Er 2 3
	69	Thulium	2 8 18 30 8 3	Tu 2 3
	70	Ytterbium	2 8 18 31 8 3	Yb 2 3
	71	Lutecium	2 8 18 32 8 3	Lu 2 3
t	72	Hafnium	2 8 18 32 8 4	Hf 2 3 4*
	73	Tantalum	2 8 18 32 8 5	Ta 3 4 5*
	74	Tungsten	2 8 18 32 10 4	W 2 3 4*5 6
	75	Rhenium	2 8 18 32 12 3	Re 2 3 4 6 7
	76	Osmium	2 8 18 32 12 4	Os 2 3 4* 6 8
V′	77	Iridium	2 8 18 32 14 3	Ir 2 3 4 6 7
	78	Platinum	2 8 18 32 14 4	Pt 2 4* 6
	79	Gold	2 8 18 32 16 3	Au 1 3*4
	80	Mercury	2 8 18 32 18 2	Hg 1 2*
	81	Thallium	2 8 18 32 18 3	Tl 1* 3
t	82	Lead	2 8 18 32 18 4	Pb 2* 4
	83	Bismuth	2 8 18 32 18 5	Bi 1 3* 5
	84	Polonium	2 8 18 32 18 6	Po 2 4 6
Vb	85	Alabamine (Eline)	2 8 18 32 18 7	Ab(El) 1 3 5 7
T	86	Radon	2 8 18 32 18 8 0	Rn
VIa	87	Virginium (Verium)	2 8 18 32 18 8 1	Vm(Ve) 1
	88	Radium	2 8 18 32 18 8 2	Ra 2*
	89	Actinium	2 8 18 32 18 8 3	Ac 2 3
	90	Thorium	2 8 18 32 18 8 4	Th 2 4*
	91	Ekatantalum	2 8 18 32 18 11 2	Et 2 3 5
	92	Uranium	2 8 18 32 18 12 2	U 2 4 5 6*
	93	(Transuranium, Ekarhenium)	2 8 18 32 18 13 2	
	94	(Ekaosmium)	2 8 18 32 18 14 2	

(1) *The Roman numerals indicate the period or the number of orbits of the atoms The small letters indicate the sub-periods, thus, a—the electropositive elements* (light metals), *and b—the electronegative elements* (non-metals), *T indicates the terminals of a period* (noble gases), *and, t, the transitional elements* (carbon group), *′—the* heavy metals and *″—the* rare earth metals

(2) *and* (3) *Show the atomic number and the name of the element*

(4) *Indicates the distribution of the electrons in the K, L, M, N, O, P, and Q orbits A change of an electron from one of these orbits gives rise to the corresponding radiations*

(5) *Indicates the valency or polar numbers of the elements The numbers to the left of the symbol indicate the number of electrons which that particular atom captures to form the octet The number to the right of the symbol indicates the number of electrons which the atom can give up The numbers with asterisks are the principal valencies*

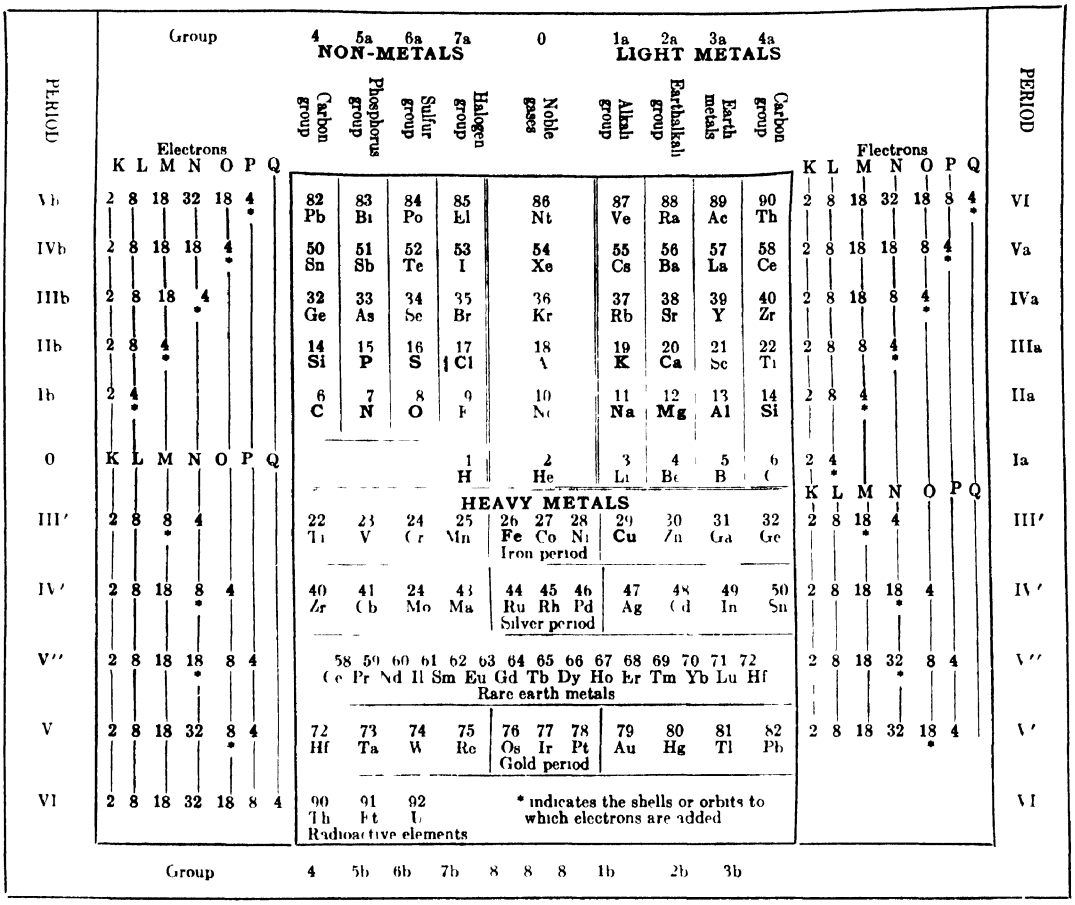


Periodic spiral

which illustrates the relationship between the chemical and physical properties and the occurrence of the elements, thus (*see next page*)

In the upper half of the diagram *All elements have low density (below 4 0), simple spectra, strong e m f , and generally a single valence* Upper left *Elements are acid-forming and negative, e g , attract additional electrons* Upper center *Elements are inert, e g , have a complete octet* Upper right *Elements are base-forming or positive, e g , give up their valence electrons*

In the lower half of the diagram *All elements have greater density (above 4 0), complex spectra, weak e m f , and generally many valencies, they are amphoteric and may gain or lose electrons* The abundance of the elements is shown by the hexagons as indicated at the top of the table



Periodic system

This new form of table is derived from the periodic spiral and indicates atomic structure, group and period relationship and the classification of the elements, thus

In the upper half of the table *All elements in the vertical direction are related to each other* Group relation *predominates, and additional electrons are added to the outermost orbit, hence valence and physical and chemical properties change rapidly in passing to succeeding atomic numbers*

In the lower half of the table *All elements are related in the horizontal direction* Period relation *predominates, and additional electrons are added to the second or third inner orbit, hence valence and properties do not change greatly in passing to succeeding atomic numbers*

peristaltics An agent or drug that increases the intestinal movements

peristaltin $C_{14}H_{18}O_8 = 314.2$ A glucoside from the bark of *Rhamnus purshiana*, (cascara sagrada) A yellow-brown, hygroscopic, crystalline powder, soluble in water or alcohol, used medicinally as a peristaltic

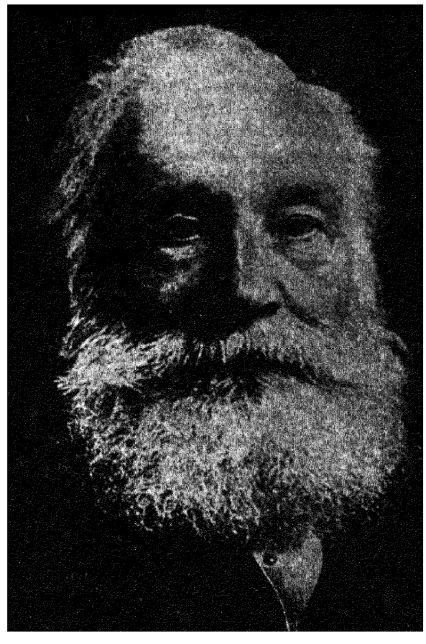
periston A colloidal solution containing polymerised vinyl pyrrolidone (hemodyn) and inorganic salts, used to raise blood pressure temporarily, and (in Germany during World War II) as a stable blood substitute

Perkin Sir William Henry 1838–1907 An English chemist noted for his work in the synthesis organic of dyes He made the first synthetic dye, mauvein in 1856 **P 's reaction** The formation of unsaturated acids of the cinnamic type by the condensation of aromatic aldehydes with fatty acids in the presence of acetic anhydride, as,

$$Ar\,CHO + CH_3COONa = Ar\,CH{=}CH\,COONa + H_2O$$

P 's violet Mauvein

perlite Pearlite (1) A volcanic glass (2) A eutectic mixture of soft α-ferrite (87 %) and hard cementite (13 %) containing 0 9 % carbon, formed during the slow cooling of molten steel



Sir William Perkin.

(From Moore, "History of Chemistry," McGraw-Hill Book Company, New York, N. Y.)

The mass contains the phases α-ferrite, cementite and graphite.

perloline. $C_{36}H_{22}O_3N_4$ = 730.3. An alkaloid from perennial ryegrass (*Lolium perenne* L.), soluble in alcohol or chloroform, slightly soluble in acetone, ether or water. Solutions in chloroform are golden-yellow, with a green fluorescence which is visible in concentrations of $1:5 \times 10^6$.

permalloy. A magnetic alloy of nickel (30–80 %) and iron.

permanent. Everlasting, fixed, and enduring. **p. gas.** A gas that cannot be liquefied or condensed by pressure alone. **p. white.** Precipitated barium sulfate.

permanganate. A salt of permanganic acid of the type, $MMnO_4$. They are dark purple in color, good oxidizing agents and many are disinfectants. **p. ion.** The negatively charged MnO_4^- radical, which imparts a purple color to a solution.

permanganic acid. $HMnO_4$ = 120.0. An acid derived from heptavalent manganese, stable only in dilute solutions; decomp. to manganese dioxide and oxygen.

permanganyl. The monovalent MnO_3^- radical. **p. chloride.** MnO_3Cl = 138.39. A green-brown liquid which emits purple fumes in moist air and explodes if heated. It is the acid chloride of permanganic acid. **p. fluoride.** MnO_3F = 121.93.

permeability. (1) The ability to pass or penetrate a substance or membrane. (2) The quantity of air flowing through a body in unit time under standard conditions of area, thickness and pressure. Cf. *porosity, osmosis.* **magnetic-** See *magnetic permeability.*

permeable. Pervious or porous. **semi-** Allowing the passage of some substances but not of other substances; as, a semi-permeable membrane.

permeate. To penetrate or pass through the pores of a body without rupture of its parts.

perminal. A trade name for a sodium alkylnaphthalene sulfonate; used as a wetting agent.

permissible explosive. See *explosive.*

permittivity. Dielectric constant.

permivar. An alloy of 45 % Ni, 25 % Co and 30 % Fe which has a high magnetic permeability and a low hysteresis loss; used in the cores of loading coils for telephone circuits.

permutation. (1) Substitution, *e.g.*, of radicals. (2) Transmutation.

permutite. $Na_2Al_2H_6Si_2O_8$. An artificial sodium aluminum silicate, (zeolite), obtained by melting aluminum silicate, sodium carbonate and sand together. A granular powder, used for softening water, as the sodium can be replaced by calcium, magnesium, iron, or manganese. It can be regenerated by a strong solution of sodium chloride: (a) hard water + Na-permutite = soft water + Ca-permutite. (b) Ca-permutite + NaCl = $CaCl_2$-solution + Na-permutite. **natural-** A zeolite mineral, boronite or refinite, used for water softening. Cf. *regeneration.* Also used for estimating ammonia in blood and urine.

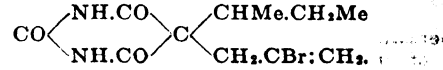
permutoid reaction. A reaction analogous to the permutite process for softening water; *i.e.*, double decomposition between a soluble and insoluble substance.

pernambuco. Lima wood, Nicaragua wood. The red wood from *Caesalpinia echinata*, a Leguminosae, used in dyeing.

pernitric acid. HNO_4. An acid of doubtful existence.

pernocton. Pernoston.

pernoston. $C_{11}H_{15}O_3N_2Br$ = 303.03. β-bromoallyl-*sec.* butylbarbituric acid, pernocton.



A colorless solid, m.132, soluble in alcohol, and used as a hypnotic preanesthetic.

Pernot furnace. A reverberatory puddling furnace with a circular inclined hearth, used in making steel.

peronine. $C_{24}H_{25}O_3N.HCl$ = 411.8. Benzylmorphine hydrochloride. A colorless, odorless powder, slightly soluble in water, soluble in alcohol; used as a narcotic.

perosis. Displacement of the ankle-joint of chickens, due to manganese deficiency.

perosmic. A compound of octavalent osmium. **p. acid.** See *osmic acid.*

Pérot lamp. A mercury-vapor lamp; used as a light source for polariscopes, spectroscopes and other optical measuring instruments.

peroffskite. The mineral $CaTiO_3$.

peroxidase. (1) An enzyme of vegetable origin that splits hydrogen peroxide into water or metal peroxides into the corresponding oxide and oxygen. (2) A substance which activates peroxides. Cf. *catalase.*

peroxide. (1) Superoxide. A derivative of hydrogen peroxide or a compound containing the bivalent —O—O— or =O_2 group, in which two oxygen atoms are singly linked. They liberate hydrogen peroxide with acids and are strong oxidizing agents; as H_2O_2, Na_2O_2, or BaO_2. (2) Used loosely for dioxides (q.v.) which liberate oxygen with acids. **acid-** A compound of the type $(RCO)_2O_2$. **p. of hydrogen.** Hydrogen peroxide.

peroxy- A prefix indicating an acid or its salt derived by substitution from hydrogen peroxide
peroxydisulfuric acid Persulfuric acid
peroxydol Sodium perborate
perparaldehyde $C_6H_{12}O_4$ = 148 1

A thin oil, m 9°C, b $_{12mm}$45, insoluble in water, soluble in organic solvents
perpetuum mobile Perpetual motion A device that is supposed to run without power
perphosphoric acid $H_4P_2O_8$ = 194 03 A crystalline solid
perrhenate A compound of the type $MReO_4$, colorless, and except those of Ag, Tl, K Rb and Cs, soluble in water
perrhenic acid $HReO_4$ = 251 32 A colorless, stable powder
Perrin Jean –1942 A French chemist and physicist noted for his researches in colloidal chemistry and atomic structure **P equation** A mathematical equation which connects the gas laws with the distribution of particles in a colloidal system such as an emulsion or suspension

$$\frac{4}{3}\pi r^3 g\,(D - d)h = \frac{RT}{N}\ln\frac{n_1}{n_2}$$

where r is the radius of the particles, D their density and d the density of the medium, g, gravitational acceleration, n_1 and n_2 the number of particles per unit volume in two layers of liquid which are a distance, h, apart, N, Avogadro's number, R the gas constant and T, the absolute temperature
perry A fermented beverage made from pear juice, analogous to cider from apple juice
persalt A salt having the highest valence number of an acid-forming element, as, perchromate, permanganate perchlorate
perseite Perseitol
perseitol $C_7H_{16}O_7$ = 212 2 Perseite A heptavalent alcohol $CH_2OH(CHOH)_5CH_2OH$, from the leaves and fruits of *Laurus persea*, Lauraceae, a tropical tree Colorless needles, m 188, slightly soluble in water or alcohol It occurs as l- and d- optically active compounds
perseulose $C_7H_{14}O_7$ = 210 11 A keto-heptose, m 110, produced by sorbose bacteria from perseitol
Pershbecker furnace A rotating furnace, heated by wood, for roasting mercury ores
Persian red Indian red
persilicic An acid or acidic rock that contains more than 60 % of silica
persimmon The fruit-bearing trees *Diospyros virginiana* of North America and *D kaki* of China and Japan (Ebenaceae)
persio Orchil
personal equation The differences in reading scientific measuring instruments or in the findings of chemical operations, that are due to temperamental or other inherent qualities or habits of the observers
persorption The intimate and almost molecular mixture of a gas and solid due to absorption, *e g*, nitrogen on charcoal Cf *sorption*
Persoz, Jean François 1805–1868 A French technical chemist and noted author **P 's solution** A solution of basic zinc chloride (10 gm $ZnCl_2$, 10 cc H_2O, 2 gm ZnO) able to dissolve silk but not wool
perspex Trade name for a transparent polymerised methyl acrylate plastic, n_D 1 4949–1 4986, softening point 120
perstoff Diphosgene
persulfate A salt derived from persulfuric acid, which contains the $=S_2O_8$ radical, made by the electrolysis of sulfate solutions

$$Na_2SO_4 + SO_4^{--} = Na_2S_2O_8 + 2(-)$$

persulfide A sulfide that contains more sulfur than is required by the normal valency of the element, as, Na_2S_2
persulfuric acid $H_2S_2O_8$ = 194 14 An acid obtained by electrolyzing sulfuric acid, $(HO\text{-}SO_2O)_2$ It occurs in lead accumulators, and is a strong oxidizing agent
perthio The divalent radical $=S=S$
perthiocarbonates Salts of the type Na_2CS_4 formed from a solution of carbon disulfide in alkali disulfides
pertusarene $C_{60}H_{100}$ = 820 78 A solid hydrocarbon from the lichen, *Pertusaria communis*
Peru apple Stramonium **P balsam** Indian balsam A reddish brown balsam from *Myroxylon (Toluifera) pereirae*, a Leguminosae of tropical America, used medicinally and contains 60 % cinnamein
peruol Benzyl benzoate
peruscabin Benzyl benzoate
peruvian balsam Peru balsam **p bark** Cinchona
peruvin Cinnamic alcohol
peruviol Nerolidol
pervaporation The evaporation of a liquid through a dialyzing membrane, such as collodion or parchment
pervesterol A sterol (q v) isolated from the fat of algae
pervious Allowing the passage of fluids Permeable, passable
perylene $C_{20}H_{12}$ = 252 2 The pentacyclic hydrocarbon $C_{10}H_6{=}C_{10}H_6$, $\alpha\alpha\alpha'\alpha'$-dinaphthylene, m 274
peryllartine $C_{10}H_{15}ON$ = 165 1 Perillaldehyde-α-antialdoxime $C_6H_8CMe{:}CH_2{:}CHNOH$ A compound which is 2000 times sweeter than sugar Cf *perillaldehyde*
pestle A blunt, rounded instrument, for pounding drugs or chemicals in a mortar or ores in a stamp mill
petalite $LiAl(Si_2O_5)_2$ A native lithium aluminum silicate
petalon The hypothetical disk-shaped nucleus of helium
pethidine The ethyl-hydrochloride of 1-methyl-4-phenyl piperidine-4-carboxylic acid An aspirin substitute
Petit, Alexis Therese 1791–1820 A French physicist, noted as an investigator of specific heats Cf *Dulong-Petit law*
petitgrain oil An essential oil distilled from the leaves and fruits of *Citrus bigardia* A yellowish liquid resembling neroli oil, d 0 887–0 90, insoluble in water, soluble in alcohol or ether Used in perfumery to adulterate neroli oil, contains linalool, limonene and esters **p citronier oil** The essential oil from the unripe fruits of *Citrus medica*, d 0 869–0 878, it contains citral, and esters of linalool
Petri dish A flat, shallow, circular glass dish, used for bacterial cultures
petrifaction Mineralization, silification The process of changing organic matter into stone or stone-like substances by the gradual infiltration and replacement of the tissues by mineral matter

petrified wood Fossil wood that has been gradually changed into stone by the slow infiltration of silica, the minutest details of its organic structure being preserved

petrify To convert into stone

Petroff reagent A sulfonic-acid of non-paraffinic hydrocarbons A by-product obtained in the refining of petroleum oils with fuming H_2SO_4, used as a catalyst in the manufacture of fats by Twitchell's method

petrographical Pertaining to the description of rocks and stones

petrography The branch of science that deals with rocks and stones as aggregates of minerals, and their chemical and physical examination and description Cf *petrology*

petrohol Isopropyl alcohol synthesized by hydration of propylene from petroleum cracking stills

petrol (1) Motor spirit or gasoline The fraction of crude petroleum distilling between 40–150°C It consists chiefly of C_6H_{14}, C_7H_{16}, and C_8H_{18} (2) Petroleum ether

petrolate A general term for products derived from petroleum, q v

petrolatum Petroleum jelly, vaselin, paraffin ointment, cosmolin fossolin, adeps mineralis, yellow petrolatum A purified mixture of semi-solid hydrocarbons obtained from petroleum as a yellow jelly-like mass, d 0 82–0 85, m 34–54 soluble in alcohol, ether, or chloroform Used externally as an ointment base for lubricating, for cleaning compounds, greasing materials, rust prevention and leather dressing **liquid-** A colorless, non-fluorescent odorless, and tasteless mixture of liquid hydrocarbons from petroleum, d 0 88–0 89 Used medicinally under various trade-names as an internal lubricant **yellow-** Petrolatum **white-** Albolene A decolorized petrolatum used as an ointment base **p album** Petrolatum, white **p jelly** Petrolatum **p liquidum** Liquid p

petrolene (1) Asphalt (2) Malthene Those oily or soft constituents of bitumen which are soluble in petroleum spirit

petroleum (1) Mineral oil, rock oil, coal oil, earth oil, seneca oil, crude oil, naphtha A native mixture of a solution of gaseous, liquid and solid hydrocarbons, forming a thick, brown or yellow oil, obtained from wells, springs, and lakes, d 0 78–0 97 (extreme limits 0 65–1 07), insoluble in water soluble in alcohol ether, or chloroform (2) The fraction of crude petroleum distilling at 150–300°C **p asphalt** The residues from Trinidad petroleum **p coke** The residue from the distillation of petroleum, used in metallurgical processes, in carbon pencils, and in making dry batteries It may contain vaselin or paraffin wax **p ether** See *petroleum fractions* **p fractions** The products obtained by the fractional distillation of petroleum

B P	*Composition*
0°C, cymogen	C_4H_{10}
18–21°C, rhigolene	C_4H_{10}, C_5H_{12}
40–60°C, petroleum ether	C_5H_{12}—C_6H_{14}
60–200°C gasolene	C_6H_{14}—$C_{10}H_{22}$
70–90°C, naphtha	C_6H_{14}—C_7H_{18}
90 120°C, ligroin	C_7H_{16}—C_8H_{18}
120–150°C, benzine	C_8H_{18}—C_9H_{20}
150–300°C, kerosene, coal oil, photogene	C_9H_{20}—$C_{16}H_{34}$
over 300°C, lubricating oils light	C_{12} to C_{20}
medium	C_{16} to C_{22}
heavy	C_{18} to C_{26}
300°C, paraffin oil, liquid petrolatum, albolene, stanolax, nujol, etc	C_{10} to C_{18}
M P	
38–50°C, vaselin, petrolatum, petroleum jelly	C_{20} to C_{22}
45–65°C paraffin, parowax, cerolene	C_{23} to C_{28}
50–80°C, paraffin wax	C_{27} to C_{30}

In practice, however, the various fractions or "cuts" are

(1) below 200°F at 1 atm , gasolene or naphtha	2–80 %
(2) from 200–275°F at 1 atm , kerosene or coal oil	3–25 %
(3) all vacuum fractions to 40 mm , gas oil (η below 50 sec)	7–50 %
(4) light lubricating oil (η = 50–99)	2–15 %
(5) medium lubricating oil (η = 100–199)	3–20 %
(6) viscous lubricating oil (η exceeds 199)	0–22 %

where η is the Saybolt viscosity in seconds **p furnace** An oil burner **p jelly** Petrolatum **p naphtha** Benzine **p ointment** Petrolatum **p pitch** Asphalt **p refining** The industrial processes concerned with the separation of the many constituents of petroleum, including cracking decolorizing, distilling, filtering, and skimming of the various products **p spirit** Ligroin

PETROLEUM

(Approximate typical composition)

A Paraffin base mainly C_nH_{2n+2} (from C_4H_{10} to $C_{35}H_{72}$), small amounts of C_nH_{2n} ($C_{21}H_{42}$ to $C_{26}H_{52}$) and C_nH_{2-x} Sulfur occurs as thiophanes, $C_nH_{2n}S$

	%C	%H	%N	%O	%S
Pennsylvania[1]	85	14	0 05	1 4	1 0
Midcontinent[6]	84	13	0 8	0 04	0 8
Ohio[1]	84	13	0 2		0 7
Canada[2]	83	13	0 15		0 4

B Naphthene base (or *asphalt base*) mainly C_nH_{2n} (naphthenes and olefines), moderate

	%C	%H	%N	%O	%S
East Indian Islands[3 5]	87	12	0 3	0 3	0 4
Argentine	87	11	0 5	0 5	0 5
Roumania	86	13			0 2
Russia[4]	86	12	0 2	1 0	0 2
California[3 4]	86	11 5	1 1		0 8
Galicia	85	14	0 5	0 3	0 2
Texas[3 4]	85	12	0 5	0 5	1 2
Colombia[4 5]	85	12	0 5		
Japan[4]	84	13	1 0	1 0	0 5
Mexico[6]	83	11	0 5	1 5	4 0

[1] rich in paraffins, [2] rich in olefines, [3] rich in asphalts, [4] rich in naphthenes, [5] rich in aromatic hydrocarbons, [6] contains both, paraffins and naphthenes

amounts of C_nH_{2n-x}, where x is 2, 4, 6, 8, etc up to 20, also some aromatic hydrocarbons, little or no C_nH_{2n-2}

The World output in 1940 was 278 million tons, chiefly from U S > Venezuela > Russia > Roumania > Iraq > Dutch East Indies > Mexico

petroline A paraffin obtained by distillation of Indian petroleum

petrology Lithology A branch of science that deals with the origin, (petrogeny) structure, and composition (petrography) of rocks and stones

petromortis Garage poison

petroselic acid Petroselinic acid

petroselinic acid $C_{18}H_{34}O_2$ = 282 37 ϵ-Octadecenic acid, $Me(CH_2)_{10}CH\ CH(CH_2)_4COOH$ An unsaturated fatty acid and isomer of oleic acid, in parsley seeds

petroselinum (1) Parsley The dried herb of *Petroselinum sativum*, an umbelliferous plant, used medicinally and in cooking (2) Parsley seeds, q v

petrosilane $C_{26}H_{42}$ = 282 5 A saturated hydrocarbon, m 69, in the unsaponifiable matter of parsley oil

petrosilex Chert A hard siliceous rock or flint stone, used for grinding pottery materials

petrous Hard or stone-like

petrox Petroxolin

petroxolin Petroxolinum liquidum, liquid petrox, petrolatum saponatum liquidum A paraffin oil that has been saponified with ammonium oleate A yellowish-brown liquid, insoluble in water, miscible with alcohol, ether, or chloroform, used medicinally in external preparations

Pettenkofer, Max von 1818–1901 A German chemist, noted for his research in medical chemistry and hygiene **P test** (1) A test for bile acids in urine made by dropping the material into a mixture of sugar and sulfuric acid A crimson color indicates the presence of bile acids (2) The determination of carbon dioxide in air by absorption in a known volume of standard baryta solution, and titration of the excess with alkali

petzite A native silver and gold telluride, $(Ag, Au)_2Te$

peucedanin $C_{16}H_{16}O_4$ = 272 1 Imperatorin A principle derived from the root of *Peucedanum officinale*, an umbelliferous plant (hog fennel), used medicinally as a diuretic

pewter An alloy 83–75 % tin and 0–20 % lead, with 0–7 % antimony and 0–4 % copper, that was used extensively for household utensils, it contains no lead

P F Abbreviation for phenol-formaldehyde plastic

Pfeiffing reagent A fat-splitting catalyst made by the action of sulfuric acid on aromatic hydrocarbons and castor oil Cf *Twitchell*

Pfeufer's green A bluish-green dye obtained from the fungus, *Chlorospenium aeruginosum*, by extraction with chloroform

pfund German for pound

pH, pH The symbol for the logarithm of the reciprocal of the hydrogen ion concentration $pH = \log 1/C_H^+$

Ph Abbreviation for phenyl, C_6H_5—

Ph B. Abbreviation for British Pharmacopoeia (B P)

Ph C Abbreviation for Pharmaceutical Chemist

Ph D Abbreviation for Doctor of Philosophy

Ph G Abbreviation for Graduate of Pharmacy

phacolite Chabazite

phacometer An instrument used for measuring the refractive index of a lens

phaeo-, phæo- See *pheo-*

phagocytes The cells of an organism which envelop and digest any invading microorganism or harmful cells, two types **fixed-** those located in the connective tissue (endothelial cells), and **motile-** those that move in the blood and lymph (leukocytes)

phagocytolysis The destruction of phagocytes by bacteria or other microorganisms

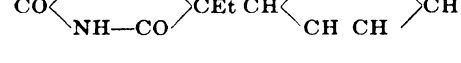
phagocytosis The destruction of microorganisms, as bacteria or protozoa, by the phagocytes or scavengers of the body Cf *Metshnikoff*

phagolysis The destruction or dissolution of phagocytes

phallin A toxic protein from *Amanita phalloides*, a poisonous mushroom, it causes hemolysis

phanerogamia The large group of flowering plants which produce seeds

phanodorn $C_{12}H_{16}N_2O_3$ = 236 2 Cyclobarbital, cyclohexenyl-ethyl barbituric acid



A white crystalline powder, m 171–174, slightly soluble in water, soluble in alcohol, used as a hypnotic

Phar D Abbreviation for Doctor of Pharmacy

Phar M Abbreviation for Master of Pharmacy

pharaoh's serpents A stick of mercuric thiocyanate, q v When ignited it glows and swells to a voluminous ash that resembles a moving worm or serpent, during its formation It liberates N_2, CS_2 and Hg-vapor and leaves a gray residue of *mellon*, q v

pharmaceutic Pertaining to drugs **p chemistry** The analysis of drugs, microscopically and chemically, and the isolation of their active constituents

pharmacist An apothecary or druggist

pharmacodynamics A branch of science that deals with the effects of drugs on living organisms

pharmacognosy A branch of science that deals with the identification, physical properties and quality of crude drugs

pharmacolite A native calcium arsenate, $CaHAsO_4\ 2H_2O$

pharmacologist One who studies drugs and their effects on living organisms

pharmacology That branch of science dealing with drugs, their origin and composition (*pharmacy*), identification (*pharmacognosy*), and effects on living organisms (*pharmacodynamics*)

pharmacopeia, pharmacopœia Lists of drugs and chemicals issued by the governments of many countries It contains a description of each drug, its composition, tests for identification and purity, and its medicinal doses Substances listed are called "official" or "officinal," and must have the specified degree of purity if intended for medical use

Ph Arg = Farmacopoeia Nacional Argentina
Ph Austr = Pharmacopoeia Austriaca
Ph Belg = Pharmacopoeia Belgica
Ph Brit = British Pharmacopoeia B P
Ph Chil = Farmacopea Chilena
Ph Dan = Pharmacopoeia Danica
Ph Españ = Farmacopea official Española
Ph Fenn = Pharmacopoeia Fennica

Ph Fr = Codex Medicamentarius Gallicus
Ph Germ = Deutsches Arzneibuch D A
Ph Graec = Pharmacopoeia Graeca
Ph Helv = Pharmacopoeia Helvetica
Ph Hisp = Farmacopoeia official Española
Ph Hung = Pharmacopoeia Hungaria
Ph Ital = Farmacopoeia ufficiale del regno d'Italia
Ph Japon = Pharmacopoeia Japonica
Ph Mex = Nueva Farmacopoeia Mexicana
Ph Ndl = Pharmacopoeia Nederlandica
Ph Norw = Pharmacopoeia Norvegica
Ph Pol = Polish Pharmacopoeia
Ph Port = Pharmacopoeia Portuguezá
Ph Rom = Pharmacopoeia Romana
Ph Ross = Pharmacopoeia Rossica
Ph Serv = Pharmacopoeia Servica
Ph Svec = Svenska Farmacopen
Ph Ven = Pharmacopoeia Venezolana
U S P = United States Pharmacopoeia

In addition to these official lists there are in use
N F = National Formulary (U S A)
N N R = New and Non-official remedies, (American Medical Association)
B P C = British Pharmaceutical Codex
E P = The Extra Pharmacopoeia (British)

The pharmacopoeias in use in different countries besides those mentioned above are
Brazil = Ph Fr, Ph Port and Ph Hisp
Central America = Ph Fr, Ph Hisp, and Ph Mex
China = Native druggists use the old encyclopedia, Pen-tsao-kang-mu and foreign druggists their home-country pharmacopoeia
Cuba = Ph Fr, U S P
Peru = Ph Fr, U S P, and Ph Hisp
Turkey = Ph Fr, and Ph Germ

Cf *dispensatory, formulary*

pharmacophore An organic radical supposed to be the active group of a drug and to combine with a group of the protoplasm (See *glucophore, osmophore, chromophore*)

pharmacosiderite A native arsenate of iron

pharmacotherapy The treatment of diseases with drugs

pharmacy The art of preparing drugs for medicinal use

phase (1) A solid, liquid or gaseous homogeneous substance, that exists as a distinct and mechanically-separate portion in a heterogeneous system, hence, any homogeneous parts of a system that are separated from one another by definite physical boundaries

gaseous mixture	single phase
liquid solution	single phase
solid solution	single phase
two immiscible liquids	two phases
each solid	one phase

Cf *colloid, zones, micelle* (2) The succession of electrical impulses of an alternating current (3) A stage in the growth of microorganisms (4) A subdivision of the changes occurring in protoplasm during karyokinesis, q v **activatory-** The active stage or the rapid growth of an organism, especially bacteria **continuous-** External or enclosing phase The surrounding or dispersion medium in a heterogeneous mixture (See *colloids*) **discontinuous-** Dispersed **dispersed-** Internal or enclosed phase The solute or insoluble part of a colloidal solution, as distinct from the solvent **dispersion-** Continuous- **enclosed-** The discontinuous or separated medium in a heterogeneous mixture **enclosing-** Continuous- **inhibitory-** The passive stage or slow growth of an organism **oriented-** A misnomer for zone, q v **suspended-** Enclosed p

p converter A device for changing the phases of an alternating electric current **p reversal** The change of the components of an emulsion, thus, an emulsion of oil in water, under certain conditions, may be converted into an emulsion of water in oil **p rule.** Gibbs phase-rule A mathematical generalization of the relations existing between systems in equilibrium $P + V = C + 2$ The sum of the number of phases, P, and the variance or degrees of freedom, V, is equal to the number of components, C, plus 2 From this it follows that the degree of variability or of freedom (the variance) is $V = C + 2 - P$ The possibilities are

V is 0 = nonvariant (a *point* on a diagram)
$s \leftrightharpoons 1 \leftrightharpoons g$
V is 1 = monovariant (a *line* on a diagram)
$s \leftrightharpoons 1$, $1 \leftrightharpoons g$ or $s \leftrightharpoons g$
V is 2 = divariant (an *area* on a diagram)
s alone, l alone or g alone

Thus, for water

liquid $\leftrightharpoons$ vapor	C = 1, P = 2, and V = 1
solid $\leftrightharpoons$ vapor	C = 1, P = 2, and V = 1
solid $\leftrightharpoons$ liquid	C = 1, P = 2, and V = 1
solid $\leftrightharpoons$ liquid $\leftrightharpoons$ vapor	C = 1, P = 3, and V = 0
salt(dissolved) $\leftrightharpoons$ salt (solid)	C = 2, P = 2 V = 2

phaselin An enzyme derived from the bean of *Dilkas mexicana*, resembling papain in action

phaseolin The chief protein of the navy bean, *Phaseolus vulgaris*

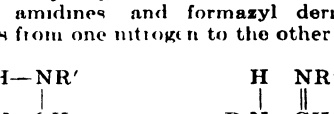
phaseoline An alkaloid obtained from string beans, *Phaseolus vulgaris*

phaseolunatin $C_{10}H_{17}NO_6$ = 247 14 A cyanogenetic glucoside, m 144, from *Phaseolus lunatus*, lima bean, a Leguminosae It is hydrolysed to HCN, acetone and glucose

phaseomannite Inositol

phasine A group of vegetable proteins derived from seeds, that agglutinate the red blood corpuscles

phasotropy A form of dynamic isomerism in which the hydrogen atom of azoamino compounds, amidines and formazyl derivatives oscillates from one nitrogen to the other



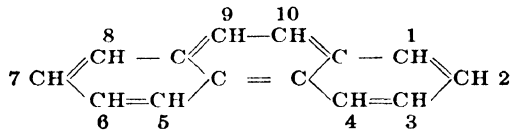
phecin $C_6H_4(OH)_2SO_4$ = 206 1 Resorcinol sulfate Colorless crystals, soluble in water, used as an antiseptic

phellandrene $C_{10}H_{16}$ = 136 1 $\Delta^{1,5}$-*p*-menthadiene, 1(7) 2-p-menthadiene, 3-iso-propyl-6-methylene cyclohexene A terpene from the seeds of *Phellandrium aquatanum* (water fennel) an Umbelliferae, and a constituent of certain eucalyptus oils, elemi oil, and the oil of water hemlock A colorless liquid, optically active, b 176

phellonic acid $C_{22}H_{42}O_3$ = 354 3 A constituent of cork

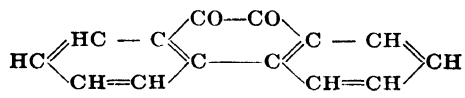
phen- (1) A prefix derived from "phenol" and indicating a derivation from benzene (2) A suffix See *-fen*

phenacaine Holocaine
phenacetein. Phenacetolin
phenacethydrazine Pyrodin
phenacetin The British term for acetophenetide, q v **methyl-** $C_{11}H_{15}O_2N$ = 193 1 Colorless crystals, soluble in alcohol or ether, used medicinally as an antipyretic **p urethane** Thermodin Cf *phenocoll, phesin*
phenacetol Phenoxy acetone
phenacetolin $C_{16}H_{12}O_2$ = 236 1 Phenacetein A red powder, used as an indicator in acidimetry, yellow with acids, red with alkalis
phenacite Be_2SiO_4 A native silicate of beryllium sometimes used as a gem
phenacyl The monovalent radical, $PhCOCH_2$— **p alcohol** See *hydroxyacetophenone* **p bromide** $PhCOCH_2Br$ A white powder, used as a reagent for hydroxy compounds
phenacylidene The divalent radical, PhCOCH=
phenacylidin $C_{15}H_{15}O_2N$ = 241 2 C_6H_4-(OMe)NH CH_2COPh A colorless powder, insoluble in water, used as an antipyretic in veterinary medicine
phenakitiscope An early name for the cinematograph
phenalgin $C_6H_5NH_3$ = 94 1 Ammoniophenylacetanilide Colorless crystals, soluble in alcohol, used medicinally as an antipyretic
phenamine Phenocoll
phenanthrahydroquinone (9 10)$C_{14}H_8(OH)_2$ = 210 15 *9 10*-Dihydrophenanthrene A solid, soluble in alcohol, ether or water, m 146
phenanthraquinone Phenanthrenequinone
phenanthrene $C_{14}H_{10}$ = 178 1 Phenanthrine An isomer of anthracene obtained from coal tar

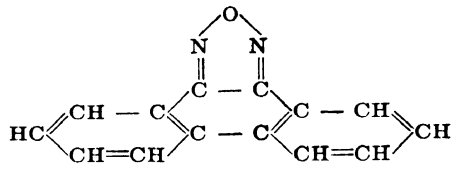


Colorless, shining scales or leaflets, d 1 063, m 99, b 340, insoluble in water, soluble in alcohol or ether, used in the synthesis of dyes and drugs **benzo-** Chrysene **dihydroxy-** Phenanthrahydroquinone **hydroxy-** Phenanthrol **methyl-1-propyl-** Retene **tetrahydro-** Tetranthrene

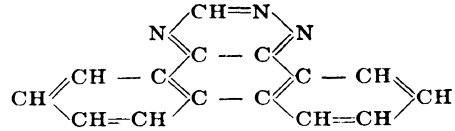
p dione Phenanthrenequinone **p hydroquinone** Phenanthrenequinone
phenanthrenequinone $C_{14}H_8O_2$ = 208 1 Phenanthrene hydroquinone, phenanthraquinone, dioxyphenanthrene An oxidation-product of phenanthrene Orange yellow needles, m 205, insoluble in water, but soluble in alcohol, ether, or chloroform



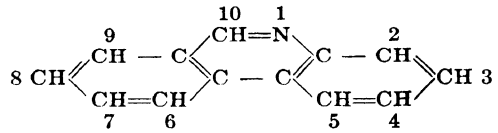
p monoxime $C_{14}H_9O_2N$ = 223 1 A compound derived from phenanthrenequinone by the replacement of one =CO group by =C(N OH) Colorless crystals, m 158, used in organic synthesis **p dioxime** $C_{14}H_{10}O_2N_2$ = 238 2 A compound derived from phenanthraquinone by the replacement of the two =C=O groups by two =C(N OH) radicals **p dioxime anhydride** $C_{14}H_8ON_2$ = 220 1 A furazane derivative



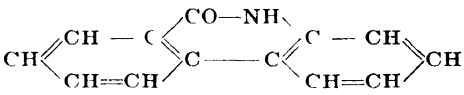
Colorless crystals, m 181
phenanthrenol Phenanthrol
phenanthrenone Phenanthrone
phenanthriazine $C_{15}H_9N_3$ = 231 2 The heterocyclic compound,



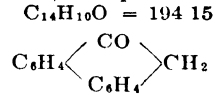
phenanthridine $C_{13}H_9N$ = 179 1 The heterocycle compound, 3 4-benzoquinoline



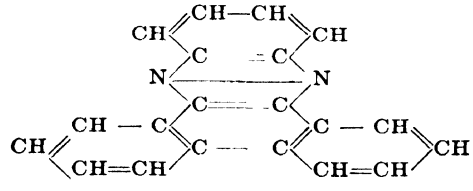
Colorless crystals, m 104, b 365, soluble in alcohol The derivatives are sometimes designated as 1 = n (nitrogen), 2 = α, 3 = β, 4 = γ, 5 = δ, 6 = δ', 7 = γ', 8 = β', 9 = α', 10 = μ (meso) **dihydroketo-** Phenanthridone
phenanthridone $C_{13}H_9ON$ = 195 07 The heterocyclic compound, dihydroketophenanthridine,



Colorless crystals, m 293, soluble in alcohol, used in organic synthesis
phenanthrine Phenanthrene
phenanthrol $C_{14}H_9OH$ = 194 1 Hydroxyphenanthrene Colorless crystals, m 112, slightly soluble in water, soluble in alcohol or ether, used in organic synthesis
phenanthrolines $C_{12}H_8N_2$ = 180 2 A series of heterocyclic compounds derived from phenanthrene by substituting two nitrogen atoms for two CH groups in the ring **ortho-** or *1 10*-compound Used as an oxidation-reduction indicator **meta-** or pseudo- or *2,9*-compound **iso-** or para- or *3,8*-compound
phenanthrone $C_{14}H_{10}O$ = 194 15

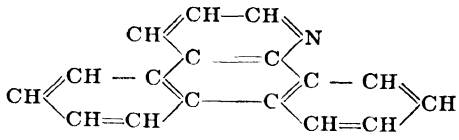


A solid, m 148, soluble in water, alcohol or ether
phenanthrophenazine $C_{20}H_{12}N_2$ = 280 10 The heterocyclic compound $\alpha\gamma$-dibenzophenazine, phenophenanthrazine,

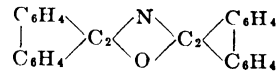


Colorless crystals, m 217, soluble in alcohol, used in organic synthesis

phenanthroquinoline $C_{17}H_{11}N$ = 229 1 Dibenzoquinoline The heterocyclic compound,



phenanthroxazine $C_{28}H_{16}ON$ = 382 1 The heterocyclic compound,



phenanthryl Describing a group of five isomeric radicals, $C_{14}H_9$—, derived from phenanthrene

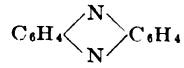
phenanthrylene The bivalent radical, $C_{14}H_8$—, derived from phenanthrene

phenaphthacridone Phenonaphthacridone

phenarsazine $C_{12}H_8AsN$ = 240 92 The heterocyclic compound

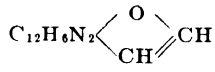
phenate Phenoxide, carbolate A derivative of phenol of the type, C_6H_5OM, in which M is a monovalent metal, as, sodium, potassium

phenazine $C_{12}H_8N_2$ = 180 1 Dibenzoparadiazine, azophenylen, *5 6*-naphthodiazine

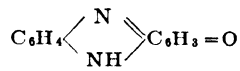


Yellow needles, m 170, b 360 soluble in water, alcohol, or ether, used in organic synthesis and in the manufacture of dyes **benzo-** See *benzophenazine* **dibenzo-** Phenanthrophenazine **dibenzyl-** See *dibenzophenazine* **naphtho-** Benzophenazine **phenanthro-** See *phenanthrophenazine*

phenazinfurane $C_{14}H_8ON_2$ = 220 2 The heterocyclic compound derived from phenazine,



phenazone (1) $C_{12}H_8N_2O$ = 196 2 The heterocyclic compound,

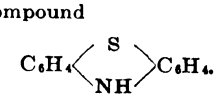


Light-green, prismatic crystals, m 156, b 360, soluble in alcohol or ether (2) The name for antipyrine in the British Pharmacopeia

phenazonium Derivatives of phenazone in which one of the nitrogen atoms is pentavalent Cf *flavinduline*

phenazonum. (1) Phenazone (2) Antipyrine

phenazothionium $C_{12}H_9NS$ = 199 1 The heterocyclic compound



phendioxin Dibenzodioxin

phene* A synonym for the benzene* ring

phenedin Phenacetin

phenegol $C_{12}H_{10}O_{12}N_2S_2HgK_2$ Mercury potassium nitro-p-phenolsulfate, $Hg(PhONO_2SO_3K)_2$ A reddish-brown powder, used medicinally as an antiseptic See *egol*

phenenyl The trivalent radical, $C_6H_3\equiv$

phenethyl The monovalent $PhCH_2CH_2$— radical Cf *phenetyl* **p alcohol** Benzyl carbinol

phenethylamine $C_8H_{11}N$ = 121 14 The amine, $PhCH_2CH_2NH_2$ **alpha-** A colorless liquid, d 0 9395, b 182, insoluble in water, alcohol, or ether **beta-** A colorless liquid, d 0 9580, b 198, soluble in alcohol, ether, or water Both are used as a local anesthetic and narcotic **p-hydroxy-** Tyramine **p-hydroxy-N-dimethyl-** Nordenine

phenethylbenzylketone $C_{16}H_{16}O$ = 224 2 $PhCH_2CH_2CO\,CH_2Ph$ A colorless liquid, b 324, soluble in alcohol or ether

phenethylene Styrene

phenetidine $C_8H_{11}ON$ = 137 14 Aminoethoxybenzene, ethoxyaniline, amino-phenetole, *p*-aminophenol ethyl ether, $NH_2C_6H_4OEt$ **ortho-** A colorless liquid, b 228, soluble in water **meta-** A colorless liquid, b (100mm) 180, soluble in water **para-** A colorless solid, m 2 4, b 244, soluble in water The para-compound is used in the manufacture of phenacetin and other synthetic drugs, *e g*, citrophen **aceto-** Phenacetin **acetophenone-** Malarin **N-acetyl-** Phenacetin **aconityl-** Apolysin **ethylcarbonate-** Eupyrine **methoxyacet-** Kryofine **monocitryl-** Apolysin **phenylglycol-** Amygdophenin **propionyl-** Triphenin **salicyl-** Saliphen **salicylal-** Malakin **valeryl-** Valeridin **p camphorate** Colorless crystals, used medicinally as a febrifuge **p salicylate** Phenosal **p tartrate** Vinopyrine

phenetidines A group of synthetic drugs derived from phenetidine

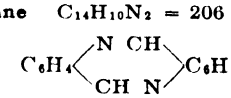
phenetidino The monovalent radical, $EtOC_6H_4NH$—

phenetole $C_8H_{10}O$ = 122 1 Phenylethylether, ethoxybenzene*, Ph O Et A colorless liquid, d 0 892, m −34, b 172, insoluble in water, soluble in alcohol or ether **acetamido-, acetylamino-** Phenacetin **amino-** Phenetidine **azo-** See *azophenetole*

phenetyl Ethoxyphenyl The monovalent radical, $EtOC_6H_4$— Cf *phenyl* **p urea** Sucrol

phengite Muscovite

phenhomazine $C_{14}H_{10}N_2$ = 206 09



phenic acid Phenol **di-** See *diphenic acid*

phenicate (1) Phenate (2) To sterilize or disinfect with phenol

phenidine Phenacetin

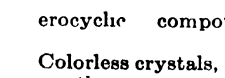
phenil Phenyl

phenin Phenacetin

phenixin Carbon tetrachloride

phenmethyl The monovalent radical, $PhCH_2$—

phenmethyltriazine $C_8H_7N_3$ = 145 2 The heterocyclic compound



Colorless crystals, m 89, b 252, soluble in alcohol or ether

phenmiazin Quinazoline

phenobarbital Luminal

phenobarbitone Luminal

phenocoll $C_{10}H_{14}O_2N_2$ = 194 12 Phenamine, amidoaceto-p-phenetidine, aminoacetyl-p-phe-

netidine, glycocoll-p-phenetidine, $C_6H_4(OEt)$-NH CO CH_2NH_2 Colorless needles, m 100, slightly soluble in water, soluble in alcohol or ether, used medicinally as an antipyretic **p salicylate** Salocoll

phenodin Hematin

phenoiazine alpha- Cinnoline **beta-** Phthalazine

phenol. (1) See also *phenols* (2) C_6H_6O = 94 1 Carbolic acid, hydroxybenzene, phenylhydroxide, PhOH, phenic acid, phenylic acid, phenylic alcohol Colorless needles, d 1 072, m 42, b 182, slightly soluble in water, soluble in alcohol, ether, or glycerol Used extensively as an antiseptic and disinfectant, and in the manufacture of many dyes and synthetic drugs, plastics and insulating materials **acetamino-** q v **aceto-** Hydroxyacetophenone **allyl-** Chavicol **allylmethoxy-** Eugenol **amino-** See *aminophenols* **aminodinitro-** Picramic acid **aminoethyl-** Tyramine **amyl-** See *amylphenol* **arsenobis-** Arsenophenol **benzoylamino-** Hydroxy*benzanilide* **betel-** Chavicol **bromo-** See *bromphenols* **chloro-** A halogenated derivative of phenol There are many isomers, as,

Chlorophenic acid, HO C_6H_4Cl	
o-monochlorophenol	m 7, b 173
m-monochlorophenol	m 33, b 214
p-monochlorophenol	m 37, b 217
Chlorophenesic acid, HO $C_6H_3Cl_2$	
2 3-dichlorophenol	m 57
2 4-dichlorophenol	m 45, b 210
2 5-dichlorophenol	m 58, b 212
2 6-dichlorophenol	m 67, b 220
3 4-dichlorophenol	m 68, b 253
3 5-dichlorophenol	m 68, b 233
Chlorophenisic acid, HO $C_6H_2Cl_3$	
2 3 5-trichlorophenol	m 53, b 253
2 4 6-trichlorophenol	m 68, b 244
Chlorophenosic acid, HO C_6HCl_4	
2 3 4 6-tetrachlorophenol	m 69, b $_{23mm}$164
2 3 5 6-tetrachlorophenol	m 65
Chlorophenasic acid, HO C_6Cl_5	
pentachlorophenol	m 188, b 310

diamino- See *aminophenols* **dichloro-** See *chloro-* **dimethyl-** Xylenol **dimethylaminoethyl-** Hordenine **dinitro-** Dinitrophenol **ethyl-** Phlorol **hexahydro-** Cyclohexanol **hydroxy-** Dihydroxy*benzene* **iodo-** See *iodophenol* **iodized-** A mixture of 20 % iodine, 60 % phenol, and 20 % glycerol, used as an antiseptic **iodo-** A group of iodized derivatives, as

Iodophenic acid, HO C_6H_4I	
o-monoiodophenol	d 1 876, m 40 4, b $_{160mm}$187
m-monoiodophenol	m 40
p-monoiodophenol	m 94
Iodophenesic acid, HO $C_6H_3I_2$	
2 4-diiodophenol	m 72, b 100
2 6-diiodophenol	m 68
3 4-diiodophenol	m 83
3 5-diiodophenol	m 104
Iodophenisic acid, HO $C_6H_2I_3$	
2 4 6-triiodophenol	m 156

isopropylmethyl- Thymol **liquefied-** Liquefied carbolic acid Phenol kept liquid at ordinary temperature by the addition of 13 parts distilled water **methenylamido-** Benzoxazole **methoxy-** Guaiacol **methoxymethyl-** Creosol **methyl-** Cresol **methylallyl-** Anethol **methyl-p-amino-** Metol **monobrom-** C_6H_4-BrOH = 173 1 A brown, oily liquid used as an antiseptic **monochlor-** C_6H_4ClOH = 128 6 A colorless liquid, used as an antiseptic **nitro-** See *nitrophenol* **nitroso-** Quinone monoxime **propenyl-p** Anol **propyl-** Thymol **seleno-** Selenophenol **sulfo-** Aseptol **tetrahydro-** Cyclohexanol **thio-** See *thio-* **triamino-** See *aminophenols* **trichloro-** See *chloro-* **trimethyl-** (2 3 5-) Isopseudocuminol (2 4 6-) Mesitol **trinitro-** Picric acid **vinyl-enebis-** Stilbenediol

p acids A group of organic compounds that contain both, a hydroxy group attached to a ring, and a carboxyl group

Monobasic phenol acids	
hydroxybenzoic acids, salicylic acid	HO C_6H_4 COOH
hydroxytoluic acids	HO C_6H_3Me COOH
hydroxyphenylacetic acid	HO C_6H_4 CH_2 COOH
hydroxymesitylinic acids	HO $C_6H_2Me_2$ COOH
hydroxyphenylpropionic acid	HO C_6H_4 CH_2CH_2COOH
dihydroxybenzoic acid	$(HO)_2C_6H_3$ COOH
dihydroxytoluic acids	$(HO)_2$ C_6H_2Me COOH
dihydroxyphenylacetic acid	$(HO)_2$ C_6H_3 CH_2COOH
trihydroxybenzoic acid, gallic acid	$(HO)_3$ C_6H_2 COOH
Dibasic phenol acids	
hydroxyphthalic acids	HO $C_6H_3(COOH)_2$
hydroxyuvitic acids	HO $C_6H_2Me(COOH)_2$
dihydroxyphthalic acids	$(HO)_2C_6H_2(COOH)_2$

p bismuth Bismuth carbolate **p blue** $C_{14}H_{14}N_2O$ = 226 13 Dimethyl amino phenylimide A blue dye, used as an indicator **p camphor** A mixture of phenol and camphor, used as a germicide **p coefficient** The antiseptic power of a substance compared with phenol as unity, *e g*, a disinfectant three times as active as phenol has a phenol coefficient of three (Cf *Rideal-Walker test*) **p derivatives** See *phenols* **p ethers** A series of compounds of the general type, Ph—O—R **p phthalein** Phenolphthalein **p red** Phenolsulfonephthalein **p sulfophthalein** Phenol-*sulfonphthalein* **p tricarboxylic acid** OH-$C_6H_2(COOH)_3$ = 226 09 A solid, decomp 245

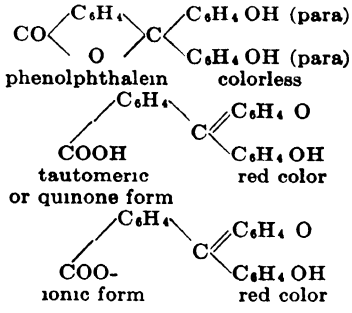
phenolase An enzyme that oxidizes phenols

phenolate (1) To disinfect with phenol, or sterilize a solution by adding phenol (2) Phenate

phenolic Pertaining to phenol

phenology The study of bird migrations, with special reference to the influence of climate

phenolphthalein, phenothalin $C_{20}H_{14}O_4$ = 318 2 Dihydroxydiphenylphthalide, dioxydiphenylphthalide, p_2-phthalein, phenolax, dioxytriphenylcarbinol carboxylic acid anhydride White, odorless small triclinic crystals, d-1 276, m 250, slightly soluble in water, soluble in alcohol or ether, used as an indicator in titrating most acids (colorless with acids, deep red with alkalis), medicinally, as a purgative, and technically, in the synthesis of dyes The change of color is thought to be due to the formation of a colored ion



Cf *phenolphthaline, phthalein, phenolsulfonphthalein, indicators* **bismuthtetraiodo-** Eudoxine **mercurytetraiodo-** Apagallin **sodiumtetraiodo-** Antinosin **tetrabromo-** An indicator **tetraiodo-** Nosophen

phenolphthalide A compound which contains the Ph CO OCR$_2$ group, in which R is an aromatic radical Compare *fluoran, fluorescein, eosin*

phenolphthaline $C_{20}H_{16}O_4$ = 320 23 The water-soluble compound $(C_6H_4OH)_2$ CH C_6H_4-COOH, m 225, used as a reagent for copper and blood Cf *phenolphthalein*

phenolquinine Quinine carbolate

phenols (1) Arylhydroxides, such as phenol, anethol, phenanthrol and their derivatives, particularly (2) hydroxybenzenes A group of organic compounds which contains one or more hydroxyl group attached to an aromatic or carbon ring They may be grouped into

I Monoatomic (Hydroxybenzenes)
phenol, phenylhydroxide C_6H_5OH or PhOH
cresols, toluylhydroxide $C_6H_4(OH)Me$
xylenols, dimethylhydroxybenzene $C_6H_3(OH)Me_2$
mesitol, trimethylhydroxybenzene $C_6H_2(OH)Me_3$
durenol, tetramethylhydroxybenzene $C_6H(OH)Me_4$
thymol, carvacrol $C_6H_3(OH)MePr$
pentamethylphenol C_6Me_5OH

II Diatomic (Diphenols, or Dihydroxybenzenes)
catechol, resorcinol, quinol $C_6H_4(OH)_2$
orcinol, homopyrocatechol $C_6H_3Me(OH)_2$
dihydroxyxylol $C_6H_2Me_2(OH)_2$
mesorcinol $C_6HMe_3(OH)_2$
thymoquinol $C_6H_2MePr(OH)_2$

III Triatomic (Triphenols, or Trihydroxybenzenes)
pyrogallol, phloroglucinol $C_6H_3(OH)_3$
methylpyrogallol $C_6H_2Me(OH)_3$

IV Polyatomic (Polyphenols, or Polyhydroxybenzenes)
tetrahydroxybenzene $C_6H_2(OH)_4$
pentahydroxybenzene, quercitol $C_6H(OH)_5$
hexahydroxybenzene, inositol $C_6(OH)_6$

Cf *naphthol, anthrol, aminophenols, phenol acids* **di-** A p containing two —OH groups **poly-** A p containing four or more —OH groups **sulfurized-** Syntans **tri-** A p containing three —OH groups

phenolsulfonate. Sulfophenylate, sulfocarbolate A salt of phenolsulfonic acid, HO C_6H_4 SO_3M

phenolsulfonephthalein $C_{19}H_{14}O_5S$ = 354 2 Phenolred A sulfuric acid derivative of phenolphthalein, $(OHC_6H_4)_2{=}C\langle{}^{C_6H_4}_{O}\rangle SO_2$, generally marketed as the monosodium salt A bright red crystalline powder, slightly soluble in water Used in pathology as a test for the secreting power of the kidneys, and as a pH indicator changing at 7 7 from yellow (acid) to red (alkaline)

phenolsulfonic acid $C_6H_4(OH)SO_3H$ = 174 14 A group of three isomeric acids, soluble in alcohol or water, obtained by heating phenol with concentrated sulfuric acid **ortho-** Aseptol

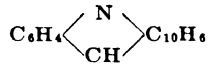
phenolsulfuric acid Phenyl sulfuric acid

phenomena The plural of *phenomenon*

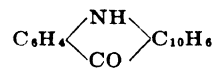
phenomenon An event or manifestation, that which is apparent, as distinct from that which merely exists

phenomorpholine C_8H_9ON = 135 08 Dihydro-*1 4*-benzoxazin The heterocyclic compound, $O\langle{}^{C_6H_4}_{CH_2\,CH_2}\rangle NH$

phenonaphthacridine $C_{17}H_{11}N$ = 229 1 Benzacridine The heterocyclic compound



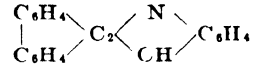
phenonaphthacridone $C_{17}H_{11}ON$ = 245 1 Phenaphthacridone The heterocyclic compound



phenonaphthazine Benzophenazine

phenones A series of ketones of the general type, Ph CO R, as, propiophenone, Ph CO-Et, butyrophenone, Ph CO Pr

phenophenanthracridine $C_{21}H_{13}N$ = 279 1 The heterocyclic compound



phenophenanthrazine Dibenzophenazine

phenopiazine Quinoxaline

phenoprene $C_{10}H_{11}$ = 131 01 *2*-Phenylbutadiene-*1 4* The unsaturated hydrocarbon CH_2 CPh CH CH_2

phenopyrine Antipyrine carbolate, antipyrine phenate A colorless, oily liquid, insoluble in water, soluble in alcohol or ether Used medicinally, internally as an antipyretic, externally as an analgesic

phenoquinone $C_6H_4O_2$ $2C_6H_6O$ = 296 22 A solid, m 71, soluble in water, alcohol, or ether

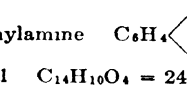
phenoresorcin. Resorcinol carbolate, resorcin phenate A mixture of phenol and resorcinol, used medicinally in skin diseases

phenosafranine $C_{18}H_{15}N_4Cl$ = 322 62 *3 6*-Diaminophenylphenazine chloride An aniline dye used in photography to prevent fogging of plates Green needles of metallic luster, soluble in water or alcohol with a red color, used as an oxidation-reduction indicator Cf *aposafranine*

phenosal $C_{17}H_{17}O_3N$ = 315 2 Phenetidine salicylate, EtO—C_6H_4—NH CO CH_2O—C_6H_4-COOH Colorless crystals, slightly soluble in water, used medicinally as an antirheumatic

phenosalyl A mixture of phenol, salicylic acid, menthol, and lactic acid, used as an antiseptic

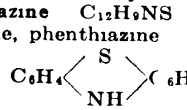
phenose $C_6H_6(OH)_6$ = 180 1 Hexahydroxyhexahydrobenzene A colorless, amorphous, deliquescent powder, soluble in water Cf *inositol*

phenoselenazine $C_{12}H_9NSe$ = 246 28 Selenodiphenylamine 

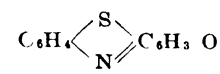
phenostal $C_{14}H_{10}O_4$ = 242 1 Diphenyloxalate, diphenyloxalic ester $(COOPh)_2$, used as a germicide and disinfectant

phenosuccin Pyrantin

phenothalin Phenolphthalein

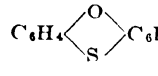
phenothiazine $C_{12}H_9NS$ = 199 1 Thiodiphenylamine, phenthiazine The heterocyclic compound  Colorless rhombic crystals, m 180, b 371, soluble in water, alcohol, ether or benzene, used in the manufacture of dyes (*e g*, methylene blue), and as an insecticide

phenothiazone $C_{12}H_7NOS$ = 213 1



It is a very efficient insecticide for spraying orchards

phenothioxin $C_{12}H_8OS$ = 201 1 Phenoxthine, dibenzothioxine The heterocyclic compound,

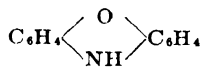


phenoxarsine $C_{12}H_9AsO$ = 243 9 A compound similar to phenoxazine, but with AsH in place of NH

phenoxaselenin $C_{12}H_8OSe$ = 238 3 A compound analogous to phenothioxin, with Se in place of S

phenoxatellurin $C_{12}H_8OTe$ = 296 6 A compound analogous to phenothioxin, with Te in place of S

phenoxazine $C_{12}H_9ON$ = 183 1 Naphthoxazine The heterocyclic compound,



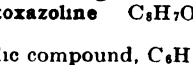
Colorless leaflets, m 150 soluble in alcohol or ether Used in the synthesis of many dyes

phenoxides Phenates

phenoxin Carbon tetrachloride

phenoxthine Phenothioxin

phenoxy* The monovalent radical, PhO—, derived from phenol Cf *oxyphenyl* **p acetaldehyde** $PhOCH_2CHO$ **p acetone** Phenacetol $PhOCH_2COMe$ **p benzene*** Phenyl ether **p caffeine** $C_{14}H_{14}O_3N_4$ = 286 11 $C_8H_9O_2N_4(OPh)$ Colorless crystals, m 145, soluble in water, used medicinally as an analgesic **p propandiol** $C_9H_{12}O_3$ = 168 1 Antodyne, glycerinmonophenyl ether $CH_2OPh\ CHOH\ CH_2OH$ Colorless crystals, m 69, soluble in water or alcohol, used medicinally as an analgesic

phenpentoxazoline C_8H_7ON = 133 1 The heterocyclic compound, 

phenphenyltriazine $C_{12}H_9N_3$ = 207 2 3-phenyl-phentriazine, derived from phentriazine

phenpiazine Quinoxaline

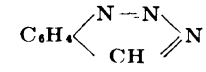
phenthiazine Phenothiazine

phentetrol Apionol

phenthiazone $C_{12}H_7NSO$ = 213 1 The heterocyclic compound,

phenthiol Thiophenol

phentriazine $C_7H_5N_3$ = 131 2 1 2 3-benzotriazine The heterocyclic compound,



Colorless crystals, m 75, b 238, soluble in alcohol, used in organic synthesis **phenyl-Phenphenyltriazine**

phenyl Ph The monovalent radical, C_6H_5—, derived from benzene, C_6H_6, or phenol, C_6H_5-OH **hydroxy-** The radical —C_6H_4OH from phenol Cf *phenoxy*

phenylacetaldehyde C_8H_8O = 120 1 $PhCH_2$-CHO A colorless liquid d 1 032 b 205, slightly soluble in water soluble in alcohol or ether Used in perfumery for its hyacinth-like odor

phenylacetamide Acetanilide

phenylacetanilide See *acetanilide*

phenylacetate $C_8H_8O_2$ = 136 1 MeCOOPh A colorless liquid, d 1 093, b 196, slightly soluble in water, soluble in alcohol or ether, used in organic synthesis

phenylacetic acid α-Toluic acid **p anhydride** $(C_6H_5CH_2CO)_2O$ = 254 2 A solid m 72 5 **p nitrile** Benzylcyanide

phenylacetylchloride C_8H_7OCl = 154 6 A colorless fuming liquid

phenylacetylene C_8H_6 = 102 19 PhC CH A colorless liquid, d 0 937, b 139, insoluble in water, soluble in alcohol or ether

phenylalanine $C_9H_{11}O_2N$ = 153 10 Aminohydrocinnamic acid An aminoacid constituent of proteins

phenylaldehyde Benzaldehyde

phenylamine Aniline

phenylamines A group of aromatic amino compounds

Primary phenylamines, $ArNH_2$
- aniline (1 compound)
- toluidine (3 isomers)
- xylidene (6 isomers)

Secondary phenylamines Ar_2NH
- diphenylamine (1 compound)
- ditolylamine (9 isomers)

Tertiary phenylamines, Ar_3N
- triphenylamine (1 compound)
- tritolylamine (27 isomers)

phenylaniline N- Diphenylamine **ar-** Biphenylamine

phenylarsonic acid Benzene arsonic acid

phenylate (1) Phenate (2) A compound of a metal and phenol, of the type, MOPh

phenylation The introduction of the phenyl group into a molecule

phenylazide $C_6H_5N_3$ = 119 06 Triazobenzene A colorless liquid, d 1 098, b $_{24mm}$73 5

phenylazo The monovalent radical, PhN N— **p aniline** See *aminoazobenzene*

phenylbenzamide Benzanilide

phenylbenzene Diphenyl

phenylbenzhydryl The monovalent radical, Ph-C_6H_4CHOH—

phenylbenzoate $C_{13}H_{10}O_2$ = 198 1 Benzophenid, phenol benzoate, benzocarbolic acid PhCOOPh Colorless monoclinic crystals, m 68, b 314, slightly soluble in water, soluble in alcohol or ether

phenylbenzoyl The monovalent radical Ph-C_6H_4CO— **p benzoic acid** $C_{70}H_{14}O_3$ = 302 11 Diphenylphthaloic acid, 4-phenylbenzophenone-2-carboxylic acid, $PhC_6H_4COC_6H_4$-COOH, used in the synthesis of dyes **p carbinol** Benzoin

phenylbenzyl The monovalent radical Ph $C_6H_4CH_2$— **p amine** $C_{13}H_{13}N$ = 183 2 $PhNHCH_2Ph$ Colorless crystals, m 32, b 298, soluble in alcohol, used in organic synthesis **p ketone** See phenyl*propiophenone* **p tin chloride** Ph $C_6H_4CH_2SnCl_2$ = 357 71 Colorless needles, m 83

phenylborine C_6H_7B = 89 8 $PhBH_2$, an isolog of aniline

phenylbromide C_6H_5Br = 156 96 Bromobenzene * PhBr A colorless liquid, d 1 497, m −30 6, b 156 2

phenylbutyric acid $C_{10}H_{12}O_2$ = 164 1 **alpha-** $Ph(CH_2)_3COOH$ Colorless crystals, m 42, b 270 soluble in water **beta-** $MeCHPhCH_2$-COOH A colorless, crystalline acid, three isomeric forms d- (m 156), l- (m 157) and r- (m 270), soluble in water Used in organic synthesis

phenylcarbamate $C_7H_7O_2N$ = 137 1 The amide of benzoic acid, $PhCOONH_2$ Colorless leaflets, m 141, slightly soluble in water, soluble in alcohol or ether

phenylcarbamido The monovalent radical, Ph-NHCONH—

phenylcarbinol Benzyl alcohol

phenylcarbylamine Phenylisocyanide

phenylchinaldine $C_{16}H_{13}N$ = 219 1 Phenylquinaldine, methylquinol Colorless crystals, soluble in water, used medicinally as an antimalarial

phenylchinoline Phenylquinoline

phenylchloride C_6H_5Cl = 112 50 Chlorobenzene,* PhCl A colorless liquid, d 1 107, m −45 2, b 132 1

phenylchloroform $C_6H_5CCl_3$ = 195 4 Benzotrichloride A colorless liquid with a penetrating odor

phenylcinchoninic acid Atophan

phenylcyanamide PhNH NC = 118 1 Cyananilide A solid, m 47, soluble in water, alcohol or ether

phenylcyanate C_7H_5ON = 119 1 Ph CNO

phenylcyanide Benzonitrile

phenyldicarbinol Xylyl alcohol

phenyldiethylaminoethylnitrobenzoate A precipitant for nitrates and perchlorates

phenyldihydrochinazolin Orexin

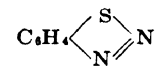
phenyldihydronaphthalene Atronene

phenyldimethylpyrazolone Antipyrine

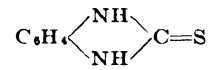
phenyldiphenylcarbinol Benzaurine

phenyldisulfide $C_{12}H_{10}S_2$ = 218 3 Phenyldithiobenzene* Ph S S Ph Colorless needles, m 60, b 310, insoluble in water, soluble in alcohol or ether

phenylene The bivalent radical, C_6H_4=, derived from benzene by replacement of two hydrogen atoms Its compounds yield three isomeric derivatives ortho-, meta-, and para-compounds **p blue** Indamine **p diacetic acid** $C_{10}H_{10}O_4$ = 194 1 The dibasic acids $C_6H_4(CH_2COOH)_2$, *ortho-* (m 150), *meta-* (m 190), and *para-* (m 244) **p diamine.** $C_6H_8N_2$ = 108 08 Diaminobenzene, benzenediamine* $C_6H_4(NH_2)_2$ **o-** or *1 2-* m 103 8, b 252 **m-** or *1 3-* d $_{67}$1 107, m 62 8, b 287 **p-** or *1 4-* Ursol m 139 7, b 267 Used as a dye for hairs and furs, as an indicator, and reagent for nitrogen *methyl-* Tolylenediamine *phenylazo-* Chrysoidine **p diazosulfide** $C_6H_4N_2S$ = 136 1 The heterocyclic compound



Colorless crystals, m 35, b 129, soluble in alcohol **p dimercaptan** $C_6H_6S_2$ = 142 18 Benzenedithiol, $C_6H_4(SH)_2$ **m-** or 1 3- Dithioresorcinol Colorless crystals, m 27, b 243 **p-** or **1 4-** Dithiohydroquinone Colorless crystals, m 98 **p disazo** The bivalent radical, —N NC_6H_4N N— **p sulfourea** $C_7H_6N_2S$ = 150 2 Thiobenzimidazoline, p thiourea The heterocyclic compound,



Colorless crystals, m 298, soluble in alcohol, used in organic synthesis

phenylethane Ethyl *benzene*

phenylethanol Benzylcarbinol **p amine** $C_8H_{11}NO$ = 137 10 A white powder related to and similar in action to adrenalin

phenylether $C_{12}H_{10}O$ = 170 1 Phenoxybenzene* The aromatic oxide Ph_2O Diphenyloxide Colorless monoclinic crystals, or an oily liquid, d 1 073 m 28, b 255, nearly insoluble in water, soluble in alcohol or ether Used as a heat transfer agent instead of water or steam

phenylethyl alcohol Benzyl carbinol **p barbituric acid** Luminal **p ether** Phenetole **p hydantoin** Nirvanol **p ketone** Ethylphenylketone

phenylethylamine $C_8H_{11}N$ = 121 1 A secondary amine, PhNHEt, formed from amino acids

phenylethylene Styrene

phenylformamide Formanilide

phenylformic acid Benzoic acid

phenylgamma acid *2*-Phenylamino-*8*-naphthol-*6*-sulfonic acid

phenylglucosazone $C_{18}H_{22}O_4N_4$ = 358 3 A condensation product of phenylhydrazine and glucose Thin yellow needles, slightly soluble in water, soluble in alcohol or ether **alpha-** m 205 **beta-** m 145

phenylglycine $C_8H_9O_2N$ = 151 2 Phenylglycocoll A phenylated aminoacetic acid, $PhNHCH_2COOH$, m 127, soluble in water, alcohol or ether, used in the synthesis of indigo

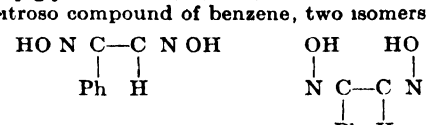
phenylglycocoll Phenylglycine

phenylglycocollic acid Mandelic acid

phenylglycol Cinnamic alcohol

phenylglyoxal Benzoyl formaldehyde

phenylglyoxime $C_8H_9O_2N_2$ = 164 08 A diisonitroso compound of benzene, two isomers

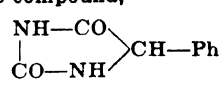


anti- m 180 amphi- m 168

phenylglyoxylic acid Benzoyl formic acid

phenyl-group The monovalent C_6H_5— or Ph radical, derived from benzene

phenylhydantoin. $C_9H_8O_2N_2$ = 176 2 The heterocyclic compound,



phenylhydrate Phenol

phenylhydrazide A derivative of phenylhydrazine of the type,

Ph NH NH COR or Ph N(COR)NH_2

beta- (symmetric) or alpha- (asymmetric)

e g Ph NH NH COH = formylphenylhydrazide

Ph NH NH COMe = acetophenylhydrazide

phenylhydrazine $C_6H_8N_2$ = 108 1 Hydrazobenzene $PhNHNH_2 \frac{1}{2}H_2O$ A colorless or pale yellow liquid, d 1 097, m 19, b 243, slightly soluble in water, soluble in alcohol or ether, used as a reagent for aldehydes and ketones, and in organic synthesis **acetyl-** Pyrodin **ethyl-** See *ethylphenylhydrazine* **phthalyl-** Phthalylphenylhydrazine **salicyl-α-methyl-** Agathin

p hydrochloride Ph NH NH_2 HCl = 144 6 Colorless crystals, m 200, soluble in water, used as a reagent for glucose, formaldehyde, and urea **p levulinic acid** Antithermin **p sulfonic acid** $C_6H_8O_3N_2S$ = 188 1 Ph NH NH - SO_2 OH **p urea** Diphenylcarbazide

phenylhydrazone $C_7H_8N_2$ = 120 1 Ph NH N CH_2 **acetone-** See *acetone phenyl hydrazone* **thionyl-** $C_6H_6N_2SO$ = 154 2 Ph NH N S O

phenylhydrazones Compounds of the type, Ph NH N CHR or Ph NH N CR_2, formed by the action of phenylhydrazine on aldehydes or ketones, as, benzaldehyde, p , acetone p

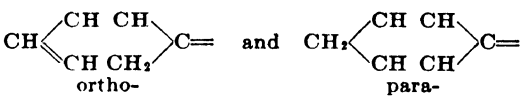
phenylhydroxide Phenol

phenylhydroxylamine C_6H_7ON = 109 1 Ph-NHOH Colorless needles, slightly soluble in water, soluble in alcohol or ether, m 80, used in organic synthesis

phenylic Pertaining to phenol or the phenyl radical **p acid** Phenol **p alcohol** Phenol

phenylid Aniline

phenylidene A group of bivalent radicals, as,



ortho- para-

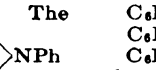
phenylindazole See *indazole*

phenylisocyanate C_7H_5ON = 119 1 PhNCO, m 163, used as reagent for hydroxy and amino compounds

phenylisocyanide PhNC = 103 1 Phenylcarbylamine isocyanobenzene A colorless liquid, d 0 978, b 165, decomp by water

phenylisonitramine Nitranilide

phenylketone Benzophenone

phenyllactazam $C_{20}H_{14}ON_2$ = 298 2 The heterocyclic compound, C_6H_4 

Colorless crystals, m 181, soluble in alcohol

phenylmercaptan Thiophenol

phenylmercuric The radical C_6H_5Hg— or PhHg— **p acetate** $CH_3COOHgPh$ = 336 67 Rhombic colorless crystals, m 149 **p chloride** PhHgCl = 313 11 Satiny leaflets, m 251 **p cyanide** PhHgCN = 303 66 White rhombic prisms, m 204 **p nitrate** $PhHgNO_3$ = 339 66 Rhombic scales, m 180, slightly soluble in water

phenylmethane Toluene

phenylmethylether Anisole

phenylmethylketone Acetophenone

phenylmustard oil C_6H_5NCS = 135 1 Phenylisothiocyanate, thiocarbanil, phenylthiocarbonimide A colorless liquid, d 1 138, m −21, b 221, insoluble in water, soluble in alcohol or ether, used in organic synthesis

phenylnaphthalene $C_{16}H_{12}$ = 204 2 $C_{10}H_7Ph$ **alpha-** A colorless liquid, m 0, b 324, soluble in alcohol or ether **beta-** Colorless scales, m 102, b 345, soluble in alcohol or ether

phenylnaphthylamine $C_{16}H_{13}N$ = 219 2 An aromatic secondary amine, $C_{10}H_7$ NH Ph **alpha-** Colorless needles, m 60, b $_{260mm}$ 335, insoluble in water, soluble in alcohol, ether, or benzene, used in organic synthesis **beta-** Colorless leaflets, m 107, b 395, insoluble in water, soluble in alcohol, ether, or chloroform, used as an anti-aging agent for rubber

phenylnaphthylcarbazole Benzonaphthindole

phenylnaphthylketone $C_{17}H_{12}O$ = 232 2 An aromatic ketone, $C_{10}H_7$ CO Ph **alpha-** Colorless rhombic crystals, m 76, b 385, insoluble in water, soluble in alcohol, used in organic synthesis **beta-** White needles, m 82, insoluble in water, soluble in alcohol or ether

phenylnitramine $C_6H_6O_2N_2$ = 138 1 An aromatic nitramine Ph NH NO_2 and isomer of diazoic acid Colorless leaflets, m 46, explodes 98, soluble in water, alcohol or ether

phenylnitrate $C_6H_5NO_3$ = 135 09 $PhONO_2$

phenylnitrone Ph_2C NOPh

phenylo Phenyl **p boric acid** $C_6H_5B(OH)_2$ = 121 9 A white powder, sparingly soluble in water, used as a germicide Cf *borophenylic acid* **p salicylic acid** $C_{13}H_{10}O_3$ = 214 2 Hydroxydiphenylcarboxylic acid, o-oxy-diphenylcarboxylic acid, $C_6H_4(OH)$—C_6H_4COOH A white powder, soluble in water or alcohol, used as a germicide

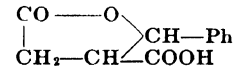
phenylogic series The hydrocarbon series, C_6H_6, $C_{12}H_{10}$, $C_{18}H_{14}$ (diphenyl series)

phenylon Antipyrine

phenyloxalate Diphenyl oxalate

phenyloxydisulfide $Ph_2S_2O_2$ = 250 26 A solid, soluble in ether, m 45

phenylparaconic acid $C_{11}H_{10}O_4$ = 206 2 An aromatic lactone



Colorless crystals, m 109, soluble in alcohol

phenylparaffin alcohols A group of aromatic alcohols in which the —OH radical is situated in the side chain as,

Ph CH_2OH = benzyl alcohol or phenylmethylol

C_6H_4Me CH_2 OH = tolycarbinol (three isomers)

$C_6H_3Me_2$ CH_2OH = mesityl alcohol

$C_6H_2Me_3$ CH_2OH = cumobenzyl alcohol

C_6HMe_4 CH_2OH = mellityl alcohol

phenyl-peri acid Phenyl-*1*-naphthylamine-*8*-sulfonic acid

phenylphenol $C_{12}H_{10}O$ = 170 08 Ph C_6H_4 OH **ortho-** White crystals, m 56, b 275, soluble in water, phenol coefficient, 38 Used as sodium-o-phenyl phenate as a preservative for glues **meta-** m 78, b 300 **para-** m 165, b 308

phenylphosphine C_6H_7P = 110 0 $PhPH_2$, phosphaniline A colorless liquid, b 160, obtained by the action of hydriodic acid and phosphorus on phenyl chloride

phenylphosphinic acid $C_6H_7O_2P$ = 158 13 Ph PO $(OH)_2$ A water-soluble solid, m 158

phenylphosphonic acid $C_6H_7O_3P$ = 158 03 Ph-O P(OH)$_2$

phenylpropiolic acid $C_9H_6O_2$ = 146 1 The unsaturated, monobasic acid, PhC C COOH Colorless, long needles, m 136, slightly soluble in water, soluble in alcohol or ether, used in organic synthesis

phenylpropionate $C_9H_{10}O_2$ = 150 1 CH_3CH_2-COOPh

phenylpropionic acid α- Hydratropic acid β- Hydrocinnamic acid

phenylpropiophenone See phenyl *propiophenone*

phenylpropylketone Butyrophenone

phenylpyridine $C_5H_5C_5H_4N$ = 155 14 **alpha-** A colorless liquid, b 269, insoluble in water, soluble in alcohol or ether **beta-** A colorless oily liquid, b 270, insoluble in water, soluble in alcohol or ether **gamma-** Colorless scales, m 77, b 274, slightly soluble in water, soluble in alcohol or ether

phenylquinaldine Phenylchinaldine

phenylquinoline $C_{15}H_{11}N$ = 205 2 Phenylchinoline A phenyl derivative of quinoline **alpha-** White needles, m 84, b 360, slightly soluble in water, soluble in alcohol or ether, used medicinally for malaria Its isomers are

2-(alpha)	m 84, b 360
3-	m 42, b 274
4-	m 61
6-	b $_{77mm}$260
8-	m 110, b $_{187mm}$283

phenylsalicylate $C_{13}H_{10}O_3$ = 214 14 Salol, phenylis salicylas, $C_6H_4(OH)COOPh$ A colorless crystalline powder of slight aromatic odor, d 1 261, m 42, slightly soluble in water, soluble in alcohol or ether, used medicinally as an intestinal antiseptic

phenylsalicylic acid $C_{13}H_{10}O_3$ = 214 14 The isomer of salol, Ph C_6H_3(OH) COOH An insoluble solid, m 160

phenylsemicarbazide $C_7H_9ON_3$ = 151 1 Ph-NH NH CO NH_2 White scales, m 172, slightly soluble in water, soluble in alcohol or ether, used in organic synthesis

phenylstannane An organic compound of tervalent tin of the general type, Sn_nPh_{2n+2}, as, Sn_2Ph_{12}, or $Sn(SnPh_3)_4$

phenylsulfate. A salt of phenylsulfuric acid of the general type, $PhOSO_3M$, as, potassium phenylsulfate

phenylsulfhydrate Thiophenol

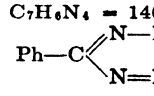
phenylsulfide $C_{12}H_{10}S$ = 186 2 Phenylthiobenzene*, diphenyl sulfide The aromatic sulfide, Ph_2S A colorless liquid, d 1 119, b 296, insoluble in water, soluble in alcohol or ether

phenylsulfone $C_{12}H_{10}SO_2$ = 218 14 Phenylsulfonylbenzene*, diphenyl sulfone, Ph_2SO_2 White needles, d 1 248, m 128, b 378

phenylsulfonyl* The radical $PhSO_2$— **p benzene*** Phenylsulfone

phenylsulfuric acid $C_6H_5OSO_3H$ = 174 1 A phenolester of sulfuric acid An unstable acid whose salts are sometimes found in urine

phenyltetrazole $C_7H_6N_4$ = 146 2 Benzenyltetrazoic acid



Colorless crystals, m 219

phenylthiocarbonimide Phenyl mustard oil

phenylthiohydantoic acid $C_9H_{10}N_2O_2S$ = 210 1 Phenyliminocarbamin thioglycollic acid PhN-C(NH_2)S CH_2 COOH White powder, m 150, insoluble in cold, soluble in hot water, used as a reagent for copper and cobalt **ortho-** PhNH C(NH)S CH_2 COOH Insoluble in water or alcohol

phenylthioisocyanate Phenylmustard oil

phenylthiourea $C_7H_8N_2S$ = 152 18 $CSNH_2$-(NH) Ph, m 154, slightly soluble in water

phenyl tin The radical $C_6H_5Sn\equiv$ or $PhSn\equiv$ **p bromide** $PhSnBr_3$ = 435 49 Colorless liquid, b $_{25mm}$185 **p chloride** $PhSnCl_3$ = 302 11 Colorless liquid, b $_{15mm}$143 **p tribenzyl** $PhSn(CH_2Ph)_3$ = 468 90 A colorless liquid, b $_{5mm}$290, soluble in organic solvents, except alcohol

phenyltoluene $C_{13}H_{12}$ = 168 1 Diphenylenmethane, phenyltolyl The three isomeric aromatic hydrocarbons, Ph C_6H_4 Me **ortho-** A colorless liquid, m 258, insoluble in water, soluble in alcohol or ether **meta-** A colorless liquid, d 1 031, b 272, insoluble in water, soluble in alcohol or ether **para-** A colorless liquid, d 1 015, m −2, b 263, insoluble in water, soluble in alcohol or ether

phenyltolyl Phenyl toluene

phenyltolylketone $C_{14}H_{12}O$ = 196 2 Tolylphenylketone An aromatic ketone, Ph CO-C_6H_4 Me **ortho-** A colorless liquid, m −18, b 315, soluble in alcohol or ether **meta-** A colorless liquid, d 1 088, b 314, insoluble in water, soluble in alcohol, ether or benzene, used in organic synthesis **para-** Colorless monoclinic crystals, m 59, b 326, insoluble in water, soluble in alcohol or ether

phenylurea $C_7H_8ON_2$ = 136 2 The phenylated urea, PhNH CO NH_2 Colorless monoclinic crystals, m 146, slightly soluble in water, soluble in alcohol or ether, used in organic synthesis

phenylureido Phenylcarbamido

phenylurethane $C_9H_{11}O_2N$ = 165 1 Euphorin, ethylphenylcarbamate, carbamilic ether The ethyl ester of phenylcarbamic acid, Ph NH-COO Et A white crystalline powder of clove-like odor and taste, m 51, b 237, slightly soluble in water, soluble in alcohol or ether, used medicinally as an antirheumatic

phenylvinylketone Acrylophenone

phenzoline Orexin

pheochrome Cellular or structural parts of a tissue stained dark by chromium salts

pheophorbide $C_{35}H_{36}O_6N_4$ = 608 6 A split-product of chlorophyll obtained by saponification of pheophytin, $C_{31}H_{31}N_4(COOH)_2COOMe$

pheophytin $C_{55}H_{74}O_5N_4$ = 870 6 A split-product of chlorophyll obtained by treatment with oxalic acid, $C_{31}H_{31}N_4(COOH)COOMe(COOC_{20}H_{39})$ Cf *pheophorbide*

pheoretin $C_{14}H_8O_7$ = 288 1 A resinous principle extracted from rhubarb root A yellowish-brown powder, soluble in alcohol and alkalis

pheron The colloidal carrier of an enzyme It is responsible for catalytic activity Cf *agon*

phesin $C_{10}H_{10}O_5NSNa$ = 259 2 Acetphenetidine sodium sulfonate A sulfo-derivative of phenacetin, $C_6H_3(OC_2H_5)SO_3Na(NH\ COCH_3)$ A pale reddish-brown, amorphous powder, soluble in water, used as an antipyretic

phi φ, ϕ, Φ The Greek letter ph (1) An abbreviation for phenyl A symbol denoting (2) fluidity, (3) amphi-position in the naphthalene ring, (4) the benzene ring in indone, (5) phlogiston

phial. A vial, or small bottle

Philip, James Charles 1873–1941 A British physical chemist

philippium A supposed rare earth metal obtained from samarskite that proved to be a mixture of terbium and yttrium

phillipite A native copper and iron sulfate, $Fe_2Cu(SO_4)_4\ 12H_2O$, blue masses

phillipsite A complex clay containing Na, K and Ca

phillygenin $C_{21}H_{24}O_6$ = 372 19 A split-product of phillyrin

phillyrin $C_{27}H_{34}O_{11}$ = 534 2 A glucoside from the bark and leaves of various *Phillyrea* species Colorless crystals, used medicinally as an antipyretic

philosopher's stone An imaginary substance supposed by the alchemists to transform base metals into gold, and, if taken internally, to prolong life It is identical with the 'elixir" of the iatrochemists, and the alkahest **p wool** Zinc oxide

philosophy An appreciation of the many branches of science into one system of correlated and generalized knowledge It differs from true science (q v) in its more imaginary and visionary viewpoint, and a tendency to bridge the gaps existing in our present knowledge by speculation Thus all phenomena of nature and life may be classed into two large groups dealing with the material and mental categories in an ascending series of complexity

Material group (objective)		*Mental group (subjective)*
ether	1st category	consciousness
electron	2nd category	perception (senses)
atom	3rd category	coordination (ideas)
molecule	4th category	thought
masses	5th category	will
organization	6th category	action (deed)

The various branches of science fall into one or the other of these categories Those of the first group are governed by unchangeable natural" laws, those of the second are subject to evolutionary progress, and accordingly to the changeable "human" laws governing society

phlobabene $C_{50}H_{46}O_{25}$ = 1046 4 A glucoside derived from various tree barks and hops that yields glucose and hopred on hydrolysis

phlobaphene A series of resinous oxidation-products of tannin materials, formed by boiling with acids They are yellowish or brown substances soluble in dilute ammonium hydroxide

phlobatannin Catechol tannin The coloring matter in the rinds of many fruits

phlogistic (1) Inflammatory (2) Pertaining to burning or fire

phlogisticated air Priestley's term for nitrogen **de-** Oxygen

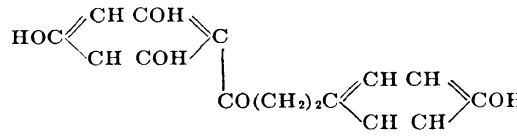
phlogiston ϕ The hypothetical component of inflammable substances **p theory** A theory that was current shortly before the birth of modern chemistry (as marked by the work of Lavoisier and the discovery of oxygen) A mystical, all-pervading substance, phlogiston, was supposed to be the combustible principle and to escape during combustion or oxidation of a substance in the form of heat and smoke, by its presence any substance was made combustible The name was due to Stahl, and the theory to Becher (1669) In the reduction of an oxide, phlogiston (ϕ) was replaced Thus "calx of zinc + ϕ = zinc" Cf *antiphlogistic theory, phlogisticated*

phlogopite Rhombic mica A complex hydrated silicate containing K, Mg, Fe, and Al, belonging to the mica group of silica minerals, q v

phlogosine A ptomaine in cultures of staphylococcus

phloretic acid $C_9H_{10}O_3$ = 166 13 *3-p*-hydroxyphenylpropionic acid, *p*-hydroxyhydrocinnamic acid, *α-β*-dihydrocoumaric acid An oxidation-product of phloretin, $C_6H_4OHCHMeCOOH$, m 128 soluble in alcohol or ether

phloretin $C_{15}H_{14}O_5$ = 274 2 A colorless crystalline split-product of phlorizin, m 253 (de-



comp), soluble in ether, and hydrolysed to phloroglucinol and phloretic acid

phlorhizin Phlorizin

phloridzin Phlorizin

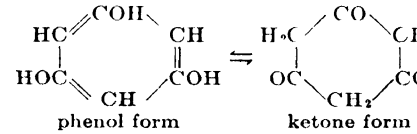
phlorizein $C_{21}H_{10}O_{13}$ = 490 3 A red coloring matter formed by oxidation of phlorizin

phlorizin $C_{21}H_{24}O_{10}\ 2H_2O$ = 472 3 Phlorhizin, phloridzin A glucoside derived from the bark and root of apple, cherry, pear, and other trees It forms white silky needles, m 110, soluble in water or alcohol, and decomp on hydrolysis into glucose and phloretin Used medicinally as an antimalarial and tonic Cf *rufin*

phlorobenzophenone Benzophloroglucinol

phloroglucin(e) Phloroglucinol

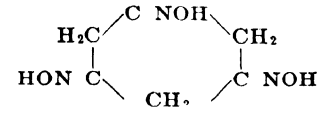
phloroglucinol $C_6H_6O_3\ 2H_2O$ = 162 11 Phloroglucin, 1 3 5-trihydroxybenzene, $C_6H_3(OH)_3$, *1 3 5*-benzenetriol*, 3 5-dihydroxyphenol White or yellowish crystals, m 217, soluble in water, alcohol or ether Used as a reagent for HCl in gastric juice, for pentoses, lignin and pentosans, for hydrated chloral, etc and in detecting groundwood fibre Two tautomeric forms



phenol form ketone form

benzo- See *benzophloroglucinol* **hexahydro-** Phloroglucitol **triamido-** $C_6H_9O_3N_3$ = 171 2 2 4 6-triamino-1 3 5-trihydroxybenzene **trinitro-** $C_6H_3O_9N_3$ = 261 1 2 4 6-trinitro-1 3 5-trihydroxybenzene **p phthalein** Gallein

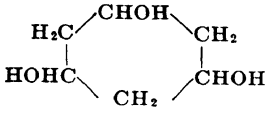
p test A test for pentoses add hydrochloric acid and a small fragment of phloroglucinol On heating a cherry-red color develops and a precipitate forms Lignified fibers behave similarly **p trioxime** $C_6H_9O_3N_3$ = 171 13



an isomer of triamido phloroglucinol Decomp 140

phloroglucite Phloroglucitol

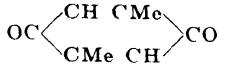
phloroglucitol $C_6H_{12}O_3$ = 132 1 Methylene triol, cyclohexan-1 3 5-triol, hexahydrophloroglucinol, phloroglucite The saturated compound,



Colorless crystals, m 184, soluble in water or alcohol

phlorol $C_8H_{10}O$ = 122 1 o-ethylphenol, C_6H_4-(OH)Et A colorless oily liquid obtained from cresols, b 211, soluble in alcohol or ether

phlorone $C_8H_8O_2$ = 136 06 p-xyloquinone



Colorless crystals, m 125 Cf *phorone*

phlorose α-Glucose

phloxin Tetrabrom-dichloro-fluorescein A purple aniline dye similar to eosin, used as pH indicator changing at 3 5 from colorless (acid) to magenta (alkaline)

phocenic acid Valeric acid

phocenin $C_{18}H_{32}O_6$ = 324 2 Trivalerin, the valeric acid ester of glycerol $C_3H_5(OOC\text{-}C_4H_9)_3$

phœ- See *pho-*

phoenicochroite A native lead chromate, $PbCrO_4$

phon The International unit of loudness When a sound is n decibels greater than corresponds with 10^{-6} watts per sq cm , then the loudness is n phons

phonene A group of similar sounds

phonic Pertaining to sound **infra-** The inaudible air-vibrations of wave-lengths greater than that of sound **ultra-** The inaudible air-vibrations shorter in wavelength than sound

phonochemical A reaction induced or produced by sound, as, the evolution of gases from solutions

phonodeik An apparatus for the study of the shapes and speeds of sound waves

phonolite A variety of feldspar

phonometer Sonometer

phonosensitive Affected by sound

-phore A suffix indicating "to carry, bear or bring forth", as, in

chromo- (chromogen)	color
gluco- (dulcigen)	sweetness
pharmaco-	pharmacologic action
osmo- (odoriphore)	odor

phoretic See *electron*

phorone $C_9H_{14}O$ = 138 2 An unsaturated ketone, di-iso-propilidene-acetone, Me_2C CH - CO CH C Me_2 A pale yellow liquid or yellow prisms, d 0 885, m 28, b 196, insoluble in water, soluble in alcohol or ether, used in organic synthesis Cf *phlorone*

phoronomy A formal branch of science (q v), dealing with motion, time and relativity

phosgene Carbonyl chloride **di-** Trichloro-methyl-chloroformate **thio-** Thiophosgene

phosgenite $PbCl_2\,PbCO_3$ Horn lead A native carbonate and chloride of lead

phosphagen Guanidinophosphoric acid, phosphocreatinine A compound of phosphorus and creatinine, which plays a part in the chemical phenomena of muscle contraction

phospham PN_2H = 60 0 An infusible phosphorazide, a white powder obtained by the action of ammonia on PCl_5

phosphamic acid Amidophosphoric acid

phosphamide PO NH NH_2 = 78 07 A white powder, insoluble in water, dilute acids or alkalis

phosphaniline Phenylphosphine

phosphatase An enzyme from body-organs or -fluids that splits carbohydrate-phosphate combinations **p test** A test for raw milk in heated milk which depends on the presence of the active phosphatase in the former This liberates phenol from sodium diphenyl phosphate, and the former is determined colorimetrically

phosphate (1) A salt of phosphoric acid containing the trivalent $PO\equiv_4$ radical, as,

M_3PO_4 = normal or tertiary phosphate
M_2HPO_4 = monoacid, monohydric, dibasic or secondary phosphate
MH_2PO_4 = diacid, dihydric, monobasic or primary phosphate
(M, M′)PO_4 = double phosphate
(M, M′, M″)PO_4 = triple phosphate

(2) A salt of one of the phosphoric acids, as

$M_4P_2O_6$	*hypo*phosphate
M_3PO_4	*ortho*phosphate
MPO_3	*meta*phosphate
$M_4P_2O_7$	*pyro*phosphate

acid- A mono- or dihydric phosphate, as, M_2HPO_4, MH_2PO_4, or $M_2H_2P_2O_7$ **alkaline-** A phosphate of sodium or potassium **bone-** Calcium phosphate, $Ca_3(PO_4)_2$ **dibasic-** A compound of the type, M_2HPO_4 **dihydric-** A compound of the type, MH_2PO_4 **disodic-** Sodium acid phosphate, Na_2HPO_4 **earthy-** A phosphate of the alkaline earth metals, as, Mg or Ca **hypo-** A salt of hypophosphoric acid of the type, $M_4P_2O_6$ **meta-** A salt of metaphosphoric acid, MPO_3 **monobasic-** An acid phosphate of the type MH_2PO_4 **monohydric-** An acid phosphate of the type M_2HPO_4 **normal-** A salt in which all hydrogen atoms of the acid have been displaced, as, Na_3PO_4, $NaPO_3$, or $Na_4P_2O_7$ **ortho-** A salt of orthophosphoric acid, M_3PO_4 **pyro-** A salt of pyrophosphoric acid, $M_4P_2O_7$ **stellar-** Calcium phosphate occurring in star-shaped crystals **super-** See *superphosphate* **triple-** (1) A salt of the type MM′M″PO_4, as, NH_4KNaPO_4 (2) A calcium, magnesium and ammonium phosphate sometimes occurring in urine **p of lime** Apatite **p rock** A sedimentary rock containing calcium phosphate

phosphated Containing phosphates, as, phosphated water

phosphatic Pertaining to or containing phosphates, as, phosphatic slag

phosphatides Phospholipins Phospholipids A group of lipoid substances which occur in cellular structures and contain esters of phosphoric acid, as, cephalin lecithins, etc **amino-** Lecithins

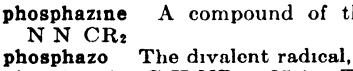
phosphatins A group of organic phosphates in animal tissues

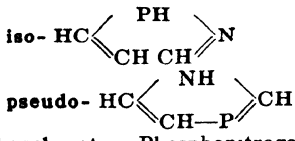
phosphazide A compound of the type, R_3P - N N NR

phosphazine A compound of the type, R_3P - N N CR_2

phosphazo The divalent radical, —N P—

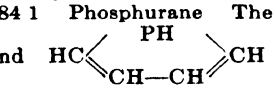
phosphazol C_3H_4NP = 85 1 The heterocyclic compound





phosphazote Phosphonitrogen

phosphene C_4H_5P = 84 1 Phosphurane The heterocyclic compound



Cf *pyrrole*

phosphenyl The divalent radical $>PC_6H_5$ **p chloride** $C_6H_5PCl_2$ = 179 03 An unstable liquid, d 1 319, b 224 6 **p oxychloride** $C_6H_5OPCl_2$ = 194 98 A liquid, d 1 375, b 258

phosphenylic acid $C_6H_5H_2PO_2$ = 158 1 Phenylphosphorous acid A crystalline solid, m 158, decomp on further heating, soluble in alcohol or ether

phosphide A binary compound of phosphorus which contains trivalent P, as, Na_3P or Ca_3P_2 **hydrogen-** Phosphorus hydrides

phosphine PH_3 = 34 1 See *phosphorus hydrides* **p oxide** An organic derivative which contains the trivalent ≡PO group, as, Et_3PO, triethylphosphine oxide, m 53, b 243 **p sulfide.** An organic derivative which contains the trivalent ≡PS group, as, Et_3PS, triethylphosphine sulfide, m 94

phosphines A group of organic compounds derived from phosphine by the replacement of one or more hydrogen atoms

RPH = primary phosphines
- $MePH_2$ = methylphosphine, b −14
- $EtPH_2$ = ethylphosphine, b 25
- $PhPH_2$ = phenylphosphine, b 160

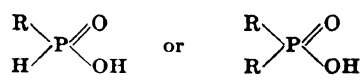
R_2PH = secondary phosphines
- Me_2PH = dimethylphosphine, b 25
- Et_2PH = diethylphosphine, b 85
- Ph_2PH = diphenylphosphine, m 75, b 360

R_3P = tertiary phosphines
- Me_3P = trimethylphosphine, b 40
- Et_3P = triethylphosphine, b 128
- Ph_3P = triphenylphosphine

R_4POH = quaternary phosphines

See *phosphonium compounds, amines, arsines, stibine, bismuthine*

phosphinic acid An organic derivative of hypophosphorous acid which contains either the monovalent $—H_2PO_2$ radical, or the divalent $=HPO_2$ radical, as,



Me HPO OH methylphosphinic acid

Me_2 PO OH, dimethylphosphinic acid, m 76.

Cf *phosphonic acid, phospho acid*

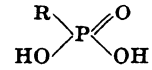
phosphinimine A compound of the type, R_3P NR

phosphite. Any salt of phosphorous acid which contains the trivalent $≡PO_3$ radical *E g.*, Na_3PO_3, *normal* sodium phosphite, Na_2HPO_3, *acid* sodium phosphite, NaH_2PO_3, *diacid* sodium phosphite

phospho- Indicating the presence of phosphorus **p acid** An organic derivative of asymmetric phosphorous acid·

$P(OH)_3$ = $H—P\ O(OH)_2$
symmetric asymmetric

which contains the monovalent $—PO(OH)_2$ radical, as,



Cf *phosphonic, phosphinic acid*

$MePO(OH)_2$ = methylphospho-acid, m 105

$EtPO(OH)_2$ = ethylphospho-acid, m 44

p -albumin An albuminous substance which contains phosphorus **p -globulin** Nucleoalbumin **p -lipin** An ester of a fatty acid containing nitrogen and phosphorus radicals **p -nitrogen** Phosphazote A fertilizer obtained from urea solution and phosphate rocks **p -protein** See *phosphoprotein*

phosphoaminolipid A complex lipid which contains phosphorus and amino-nitrogen Cf *phospholipid*

phosphobenzene Phosphorobenzene

phosphocalcite Pseudo*malachite*

phosphocarnic acid Nucleol

phosphocerite Rhabdophane

phosphochalcite Pseudo*malachite*

phosphoglobulin Nucleoalbumin

phosphogypsum A gypsum produced in the manufacture of phosphoric acid and used in cement

phospholeum A mixture of a phosphate or a phosphoric acid with soap, used to prevent precipitation of the latter in hard water

phospholipid A proposed name for phosphatide, *q v* Cf *phosphoaminolipid*

phospholipin, -lipoid Phosphatide

phosphomolybdic acid $H_3PO_4\ 12MoO_3\ 12H_2O$ = 2042 3 A yellow solid used as a reagent

phosphonic acid A group of organic compounds of the type, $RO\ P(OH)_2$, as $C_6H_5O\ P(OH)_2$, phenyl phosphonic acid Cf *phosphinic acid phospho acid*

phosphonitrogen See *phospho-*

phosphonitryl The radical =PN **p bromide** Phosphorus bromonitride **p chloride** $PNCl_2$ = 115 9 A substance formed by the action of NH_4Cl on PCl_5 It readily polymerises at 260°C , to a substance closely resembling rubber

phosphonium The monovalent radical, $PH_4—$, analogous to ammonium, $NH_4—$ Cf *-onium* **p bromide** Bromophosphonium PH_4Br **p compounds** Quaternary phosphines A group of organic compounds derived from phosphonium hydroxide, PH_4OH, by replacement of its hydrogen atoms *E g*, $R_4P(OH)$, tetra-R-phosphonium hydroxide, R_4PI, tetra-R-phosphonium iodide The halides easily dissociate **p chloride** Chlorophosphonium PH_4Cl **p hydroxide** PH_4OH **p iodide** Iodophosphonium, PH_4I

phospho no The monovalent radical, $(HO)_2PO—$ Cf *phosphonic acid*

phosphoprotein A group of conjugated proteins consisting of a simple protein combined with an unidentified phosphorous compound other than nucleic acid or lecithin

phosphor (1) The German for phosphorus (2) A substance which phosphoresces **p bronze** A hard alloy of copper (82–94 %), tin (9 5–10 8 %), zinc (1 0–2 0 %), phosphorus (0 01–0 1 %), and impurities (0 30 %) Used for suspension threads for galvanometer mirrors on account of its resistance to torque **p hydrogen compounds** See *phosphorus hydrides* **p salt** Microcosmic salt **p. tin** A white metallic alloy of phosphorus and tin, m 370

phosphorate An organic compound, analogous to a nitrosate, which contains the bivalent

$=P_2O_4$ radical, as, $C_6H_{10}P_2O_4$, cyclohexane phosphorate

phosphorated Containing phosphorus, as, phosphorated oil

phosphorescence (1) The continuous emission of light from a substance without any apparent rise in temperature, produced after exposure to heat, light, or electric discharges (2) The luminosity of a living organism, as, glow-worms or deep-sea fishes (3) In particular, the faint green glow of white, phosphorus exposed to air, due to its slow oxidation Cf *luminescence, fluorescence, scattering*

phosphorescent paint A luminous paint

phosphoretted hydrogen (1) Phosphorus hydrides (2) Phosphine

phosphoric Containing penta-valent phosphorus

p acid H_3PO_4 = 98 1 Orthophosphoric acid, the normal tribasic acid of pentavalent phosphorus Colorless crystals, d 1 884, m 38, decomp 213, soluble in alcohol or water It is marketed as various aqueous solutions 85 %—Colorless oily liquid, d 1 7, miscible with water or alcohol 10 %—Dilute phosphoric acid A clear colorless liquid d 1 057 Used as a reagent **di-** Pyro p **hypo-** See *hypophosphoric acid* **meta-** HPO_3 = 80 1 A clear, glassy mass, d 2 2, soluble in water **ortho-** Phosphoric acid **pyro-** $H_4P_2O_7$ = 178 11 A colorless crystalline powder, m 61, soluble in water, alcohol, or ether All of the above acids are derived from P_2O_5 by the addition of various amounts of water

$P_2O_5 + H_2O = 2HPO_3$, metaphosphoric acid
$P_2O_5 + 2H_2O = H_4P_2O_7$, pyrophosphoric acid
$P_2O_5 + 3H_2O = 2H_3PO_4$, orthophosphoric acid

p anhydride Phosphorus pentoxide

phosphorite (1) Apatite (2) An organic compound analogous to a nitrosite which contains the divalent $=P_2O_3$ radical, as, $C_6H_{10}P_2O_3$, cyclohexane phosphorite

phosphorobenzene $C_{12}H_{10}P_2$ = 216 12 Phosphobenzene, PhP PPh A pale yellow powder, m 149, insoluble in water

phosphorometer An optical instrument, in which the duration of a phosphorescence phenomenon is measured in terms of the rate of rotation of radiometer vanes

phosphorous (1) Phosphorescent (2) Describing a compound of trivalent phosphorus **p acid** H_3PO_3 = 82 1 Orthophosphorous acid Yellow crystals, d 1 651, m 70, decomp 200, soluble in water, alcohol or ether Used as a reagent and reducing agent **ethyl-** Ethylphosphite **hypo-** H_3PO_2 = 66 1 A colorless liquid, d 1 493, m 27, decomp by heat slightly soluble in water Its salts are the hypophosphites

phosphorus P = 30 98 and P_4 = 123 92 A non-metallic element of the nitrogen group, atomic number 15, with several allotropic modifications

(1) *Ordinary, yellow, white* or *regular* p Regular white crystals, usually compressed into yellow wax-like sticks, d 1 82, m 44, b 200, insoluble in water, and stored under water and protected from light (which changes it into the red form) Three forms of yellow p are known, α-, β and γ- respectively, γ- m 46

(2) *Red, "amorphous"* p A brownish red powder of rhombohedral crystals, d 2 2, m 72, b 350, insoluble in water or carbon disulfide Formed by heating yellow p to 240°C, non-poisonous and non-luminous

(3) *Violet* p A crystalline solid, d 2 4, m 590

(4) *Metallic, rhombohedral* or *α-black* p A black powder d 2 34, obtained by heating P in a sealed tube with molten lead It is a non-conductor of electricity

(5) *Black*, or *β-black* p A black powder, d 2 7, m 588, it is a fairly good electrical conductor

P was discovered in 1669 by the alchemist H Brandt of Hamburg, and was prepared independently by Boyle and Kunkel It forms 3 main series of compounds, derived from tri- and penta-valent P

valency		
−3	PH_3, phosphine,	PH_4X, phosphonium
+1	P_2O, p monoxide,	H_3PO_2, hypophosphorous acid
		M_3PO_2, hypophosphites
+3	P_2O_3, p trioxide,	H_3PO_3, phosphorous acid
		M_3PO_3, phosphite
	PX_3, phosphorous-,	HPO_2, metaphosphorous acid
		MPO_2, metaphosphite
+4	P_2O_4, p tetroxide,	$H_4P_2O_6$ or H_2PO_3, hypophosphoric acid
		$M_4P_2O_6$ or M_2PO_3, hypophosphate
+5	P_2O_5, p pentoxide,	H_3PO_4, phosphoric acid
	PX_5, phosphoric-,	HPO_3, metaphosphoric acid
	POX_3, phosphoryl-,	$H_4P_2O_7$, pyrophosphoric acid
		M_3PO_4, phosphate
		MPO_3, metaphosphate
		$M_4P_2O_7$, pyrophosphate

amorphous- See (2) **Baldwin's-** A phosphorescent form of commercial fused calcium nitrate **black-** (1) See (4) (2) See (5) **Bologna-** A luminescent barium sulfide **Canton-** q v **Homberg's-** Phosphorescent calcium chloride, made by heating lime and ammonium chloride **metallic-** See (4) **ordinary-** See (1) **radio-** The isotope of mass 30 Cf *radio elements* **red-** See (2) **regular-** See (1) **rhombohedral-** See (4) **salt of-** The acid sodium ammonium phosphate, $NaNH_4HPO_4$, used for bead tests **scarlet-** A scarlet powder, intermediate in activity between red and yellow p , used for matches **violet-** See (3) **vitreous-** See (1) **white-** See (1) **yellow-** See (1)

p bromides PBr_3, p tribromide PBr_4, p tetrabromide, PBr_5, p pentabromide **p bromonitride** $PNBr_2$ = 204 86 Phosphonitrile bromide Rhombic crystals, m 190 **p chloride** See *p dichloride, trichloride, pentachloride* **p dichloride** P_2Cl_4 = 203 85 An oily fuming liquid, decomp by water **p diiodide** P_2I_4 = 569 76 A yellow-reddish solid, m 110, soluble in carbon disulfide **p group** The sixth group of the periodic system, composed of the elements N, P, As, Sb, and Bi **p halides** The halogen compounds of p **p hydrides** (1) *gaseous-* PH_3 = 34 1 Phosphine, phosphoretted hydrogen, hydrogen phosphide A colorless gas of characteristic odor, poisonous, d 1 17, m −133, b −86 slightly soluble in water, readily soluble in alcohol or ether (2) *liquid-* P_2H_4 = 66 1 A colorless liquid, d 1 01, m −10, b 51, insoluble in water (3) *solid-* $P_{12}H_6$ = 378 5 Colorless crystals, decomp by heat, d 1 83, insoluble in water or

alcohol **p monoxide** P_2O = 78 05 A white solid **p oxides** P_2O, p monoxide, P_2O_3, p trioxide, P_2O_4, p tetroxide, P_2O_5, p pentoxide, P_4O, p suboxide (doubtful) **p oxychloride** Phosphoryl chloride **p pentabromide** PBr_5 = 430 6 A yellowish crystalline mass, m 100, b 106, decomp by water, used in organic synthesis **p pentachloride** PCl_5 = 208 34 Yellow rhombic crystals, fuming on exposure to air, d 3 6, m 148 (under pressure), b 160 (sublimes), decomp by water, soluble in carbon disulfide Used as a reagent, and in organic synthesis, as a chlorinating agent **p pentafluoride** PF_5 = 126 1 A colorless irritant gas, m −83, b −75 **p pentaselenide** P_2Se_5 = 458 08 A black solid, decomp by heat **p pentasulfide** P_2S_5 = 222 4 Bright yellow or gray crystalline masses, d 2 09, m 270, b 535, decomp by water, soluble in carbon disulfide Used in organic synthesis **p pentoxide** P_2O_5 = 142 1 An amorphous white powder, d 2 38, soluble in water with liberation of heat and formation of metaphosphoric acid Used as a dehydrating agent for drying gases, and as a reagent **p suboxide** P_4O Probably a mixture of red phosphorus and $P_{12}H_6$ **p tetroxide** P_2O_4 = 126 1 Colorless orthorhombic crystals, d 2 537, m 100, b 180, soluble in water **p tribromide** PBr_3 = 270 8 A colorless fuming liquid, d 2 88, m −41, b 175, decomp by water soluble in ether or carbon disulfide, used in organic synthesis **p trichloride** PCl_3 = 137 4 A clear fuming liquid, d 1 613, m −112, b 76, decomp by water, soluble in ether or carbon disulfide Its vapors are very poisonous, used in organic synthesis **p triiodide** PI_3 = 411 8 Red prisms, m 61, decomp by heat or water, soluble in carbon disulfide Used in organic synthesis **p trioxide** P_2O_3 = 110 1 Phosphorous anhydride Colorless monoclinic crystals, d 2 135, m 22 5, b 173, soluble in water, ether or carbon disulfide **p trisulfide** P_2S_3 = 158 3 A crystalline, grayish-yellow mass, m 290, b 490, decomp by water, soluble in alcohol, ether or alkalis Used in organic chemistry as a reagent

phosphoryl The trivalent ≡P O radical **thio-** The radical ≡PS **p bromide** $POBr_3$ = 286 8 A crystalline solid, d 0 822, decomp by water, m 55, b 195 **p chloride** $POCl_3$ = 153 42 Phosphorous oxychloride A colorless fuming liquid, d 1 711, m −1 5, b 110 Used as a reagent and catalyst in chlorination and dehydration **p fluoride** POF_3 = 104 03 A colorless, fuming liquid, b −40 **p nitride** PON = 61 05 An insoluble white solid **p triamide** $PO(NH_2)_3$ = 95 12 An insoluble white solid, decomp by heat

phosphotungstate Phosphowolframate A salt of phosphotungstic acid

phosphotungstic acid $WO_3\ 2H_3PO_4$ = 428 2 Phosphowolframic acid Green crystals, soluble in water, alcohol or ether, used as a reagent for alkaloids (Scheibler's reagent) and for albumin (Salkowski's reagent)

phosphowolframate Phosphotungstate

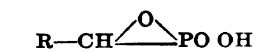
phosphowolframic acid Phosphotungstic acid

phosphurane Phosphene

phosphuranolite The mineral $(UPb)O\ P_2O_5,\ xH_2O$

phosphuretted Containing phosphorus in its lowest stage of oxidation **p hydrogen** (1) See *phosphorus hydrides* (2) Phosphine

phostonic acid A compound of the type



phot A unit of intensity of illumination 1 phot = 1 lumen per square centimeter = 10,000 lux = 1000 milliphots Cf *photometric, lux, lumen*

photic Pertaining to radiations

photics A synonym for optics

photo- Pertaining to light

photo-actinic The emission of visible and ultraviolet rays having photo-chemical activity

photobacteria Any light-producing or phosphorescent vegetable microorganism

photobiotic Pertaining to organisms that live habitually in the light

photocatalysis The acceleration of certain reactions when exposed to light

photocatalyst A substance that aids photochemical reactions, as, chlorophyll in photosynthesis

photochemical Pertaining to the chemical effects of light **p activation** See *irradiation* **p catalysis** The acceleration of a reaction by light Cf *p reaction* **p dissociation** The splitting of a molecule into its component atoms at low pressure and low temperature by the influence of light, as, $H_2 \rightarrow 2H$ Cf *p excitation* **p effect** The chemical changes produced by the influence of light, as, polymerization, allotropic changes, isotropic changes hydrolysis, oxidation, reduction, synthesis and dissociation **p equivalent** The one quantum of energy, $h\nu$, absorbed by one molecule, it will activiate or excite one molecule Hence, by measuring the total radiation, E, the number of activated molecules, n, is obtained by the simple relation $E = nh\nu$ **p excitation** Dissociation of excited atoms, as, $H_2 \rightarrow 2H^*$ Cf *p dissociation* **p induction** Draper effect The period which elapses between the exposure of reactants to light and the p reaction which occurs as a consequence **p processes** A reaction in which light energy is stored as chemical energy, as, in photosynthesis **p reaction** A reaction induced, or whose speed is influenced, by light

photochemistry A branch of science that studies the relations between light and chemical action, particularly the transformation of radiant energy into chemical energy and the reverse Cf *photosynthesis, irradiation, luminescence*

photoconductivity The property of a substance of conducting electricity when illuminated

photodynamic Describing a substance that is fluorescent in light, as, chlorophyll, hemoglobin acridine

photoelectric cell A generic term for a device which produces changes in an electric circuit by the action of light There are 3 main types (1) Photoconductive (*e g*, the selenium cell, q v) (2) Photo-emissive (*e g*, the alkali cell) in which an emission of electrons occurs in a vacuum or across a gas-filled space (3) Photovoltaic (*e g*, the rectifier cell) which depends on contact between a metal and a semi-conductor (such as selenium) **p effect** Hallwach's effect The discharge of electrons from the surface of a metal under the influence of light, leaving the metal positively charged Cf *excitation, Edison effect*

photoelectricity The transformation of light into electricity, as, in the photoelectric effect

photoelectrometer Photogalvanometer

photoelectrons The electrons emitted from the surface of a medium under the influence of light

photoflavins A group of 9-alkylated alloxazins

photofluoroscope A fluorescent screen used to make x-rays visible

photogalvanometer An electroscope whose swinging mirror reflects a beam of light, which can be recorded on a film Used to measure minute quantities of light falling on a photosensitive cell, the current of which is recorded by the electroscope Cf *microphotometer*

photogen Boghead naphtha A constituent of vegetable or animal organisms that causes their luminescence

photograph A picture or image produced and fixed on a chemically-sensitive surface **micro-** An enlargement of small objects made by means of the microscope and camera **microscopic-** A p which shows the object in a size much less than normal

photographic Pertaining to methods of recording or reproducing images by the action of light on light-sensitive surfaces **p brightness** See *spectral classification* **p chemicals** The substances used for developing, fixing, toning and sensitizing **p developer** An organic reducing agent, such as pyrocatechol or metol, used to develop an image by the reduction of the light-exposed silver salts to metallic silver **p film** A transparent and flexible sheet of cellulose coated with a light-sensitive emulsion **p filter** See *color filter* **p intensifier** A substance by which an image is intensified, as mercuric chloride **p negative** An image in which the light-values are inverted, *e g*, black appears white, and white appears black **p paper** A paper coated with a light-sensitive chemical, as silver salts or ferrocyanides **p plate** A glass plate coated with a light-sensitive emulsion (see *chromatic*) **p positive** An image copied from a p negative, in which the light values appear in their true shades **p reducer** A substance that reduces or bleaches the density of an image, as, ferrocyanides **p screens** See *color filter* **p sensitizer** A dye which, when added to the light-sensitive surface of a p plate, film or paper, increases its sensitivity toward certain wavelengths of light (see *photosensitizer*) **p spectrum** The range of wavelengths (in 0 1 Å U) which can be recorded by photography The *ordinary* range for glass lenses and ordinary plates or films extends from ultraviolet (300) to yellow (550), the *extended* range, for quartz lenses and plates or films sensitized by dyes, extends from extreme ultraviolet (210) to infrared (920) (see illustration)

photography The art and technic of recording visible objects by light-sensitive plates or films, and copying them on light-sensitive papers or other media **color-** The production of colored images by physical or chemical technic other than hand-coloring

photogravure See *gravure*

photohalide A halogen salt that is sensitive to light

photohyalography Etching glass by a photomechanical process

photoisomeric change The transformation of one isomer into another by the action of light

photolysis Decomposition or chemical action effected by the action of light on a substance in solution Two types

(a) photolyte alone is active, *e g*, decomposition of H_2S in hexane

(b) photolyte reacts with solvent, *e g*, decomposition of H_2S in water

photolyte A substance that is decomposed by light

photolytic Pertaining to the decomposition or dissociation of a substance by means of radiant energy

photomacrograph Macrograph A photographic enlargement

photomagnetism Describing magnetic phenomena produced by the influence of light

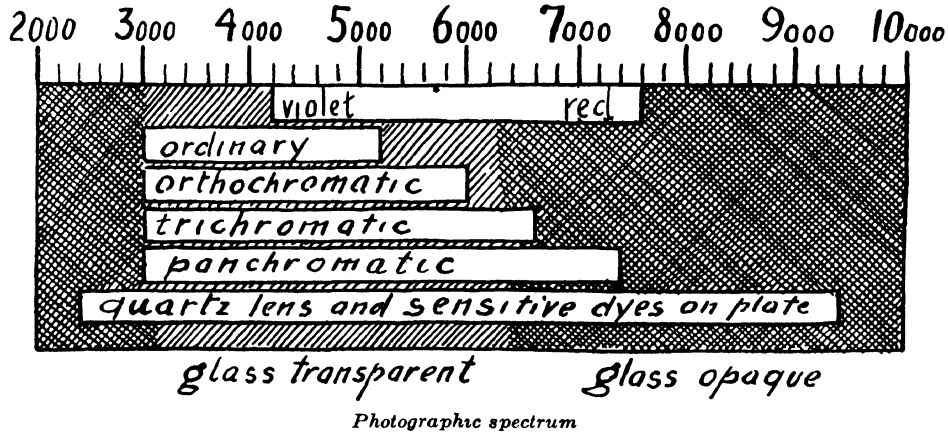
photometer A device for measuring the intensity of light, used for the accurate determination and comparison with standards of illuminants or sources of illumination Cf *turbidimeter, nephelometer, dispersimeter, colorimeter, exposure meter, actinometer, leucoscope* **micro-** See *microphotometer* **spectro-** A device for measuring the intensity of spectral lines, generally by comparison of the densities of their photographic images

photometric Pertaining to the measurement of the intensity of light **p curve** See *photomicrograph* **p standards** The intensity of light is measured by

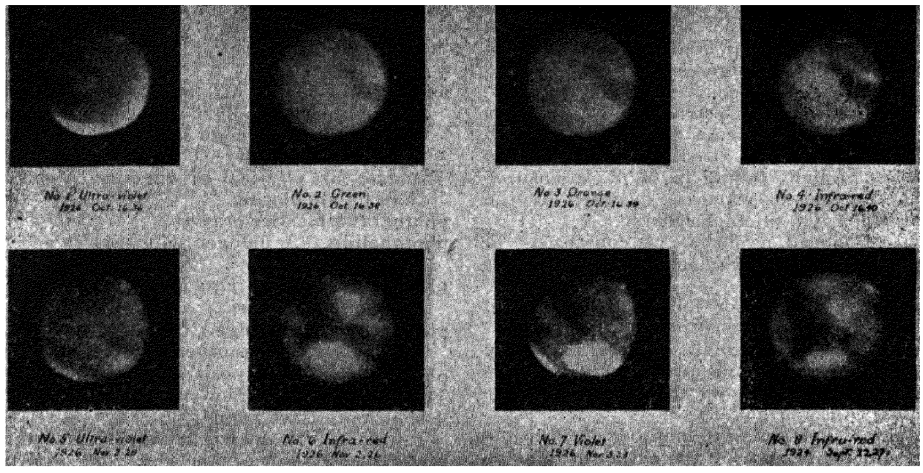
1 standard English sperm candle = 1 candle

Standard Hefner lamp, burning amyl acetate, = 0 9 candle

Standard Carcel lamp, burning colza oil = 9 6 candles



Photographic spectrum



Photosensitizers.

ıtion to photography through the atmosphere of a planet. Mars taken with lights of ıt colors by W. H. Wright at Lick Observatory.

Standard pentane lamp, burning pentane (International candle) = 10.0 candles.
For scientific work the "phot" is used for intensity, and the "lumen" for luminosity.

photometry. (1) A branch of physics dealing with the measurement of the intensity of light. (For the quality of light, see *spectroscopy, polarimetry;* for general properties of light, see *optics, radiations.*) (2) The measurement of the density of photographic images for the purpose of finding the brightness of a light source.

photomicrograph. (1) Micrograph. The magnified photograph of a microscopic object obtained by means of a microscope attached to the camera. (2) Photometric curve. The line made by a beam of light reflected from the mirror of an electroscope, and falling on a photosensitive surface; as in a polarograph or spectrophotometer.

photon. (1) A corpuscle or particle of light analogous to the electron and magneton. Light or x-rays consists of a stream of energy quanta, each quantum having energy, $h\nu$, and momentum, $h\nu/c$. (2) A structure in which the electron revolves around the proton at a distance equal to the electron radius; photon (*quantum*) = (proton + electron). Cf. *neutron, neutrino.*

photoperiodism. The rhythmic changes in the composition of the cell sap of living plants, due to the effect of light.

photophone. An instrument that transforms radiant energy into sound waves by means of selenium which alters in electrical resistance on exposure to light. Cf. *optophone.*

photophoresis. The motion of small particles under the influence of light; it is either towards (positive) or away from (negative) the light source. Cf. *radiation pressure.*

photopic. See p. *spectrum.*

photopolymerization. A condensation reaction of two or more molecules of a substance under the influence of light.

photoproduct. A substance synthesized in a living organism by the action of light; cf. precursor.

photoreaction. A chemical reaction that occurs under the influence of light.

photosensitivity. (1) The capacity of an organ or organism to be stimulated to activity by light. (2) The absorption of a certain portion of the spectrum by a chemical system. Cf. *irradiation.*

photosensitizer. A dyestuff (as aurine) which, when added to the substance of a photographic plate, increases the plate sensitiveness by absorbing the light of the wavelengths to which it best responds. Two groups:

A. halogenated fluoresceins, as
eosin..... sensitizes for yellow-green
erythrosin..... sensitizes for yellow-green
B. Derivatives of pyridine, quinoline and acridine,
1. *Isocyanins:*
pinaflavole..... green
orthochrome T... green
pinaverdol..... orange
pinachrome..... orange
acridine orange... orange
ethylred..... orange red, λ6500 Å.U.
2. *Carbocyanins:*
pinacyanole..... red λ6800
naphthocyanole..... deep red λ7500
dicyanin..... infrared λ9000
kryptocyanin..... extreme red λ8000
mesocyanin..... infrared λ9000
neocyanin..... infrared λ10000
xenocyanin..... infrared λ10000

Cf. *photographic spectrum, chromatic plates, cyanin.* See illustration.

photosphere. The outer or radiating surface of the sun, which is probably composed of incandescent clouds in a less luminous medium (cf. *chromosphere*), and is the source of the luminous portion of the solar spectrum.

photostable. Describing a substance that is not changed by light.

photosynthesis. (1) Synthesis caused by light. (2) The most important reaction of all green plants in synthesizing glucose from carbon dioxide and water by the catalytic action of chlorophyll and absorption of light and heat:

$$6CO_2 + 5H_2O + 671{,}000 \text{ calories} = C_6H_{10}O_5 + 6O_2.$$

This is followed by the polymerization of glucose to starch

photosyntometer A device to demonstrate photosynthesis of plants

phototaxis Phototropism The response of cells or organisms to light, as, phototropism

phototropism The movement of living cells or organs toward the light

phototropy (1) A reversible change of color induced by colored light, as, in fulgides (2) The change in or loss of color of dyestuffs in light of a specific wave-length

photovoltaic effect A change in potential of an electrode due to exposure to light

photronic cell Photoelectric cell

phrenosin $C_{48}H_{93}NO_9$ = 827 72 A cerebroside isolated from brain substance, it is hydrolysed to sphingosine, phrenosinic acid and galactose

phrenosinic acid $C_{24}H_{48}O_3$ = 384 38 Cerebronic acid, neuro stearic acid, $Me(CH_2)_{21}$-CHOH COOH A hydroxy acid found in phrenosin, which combines with bacterial toxins

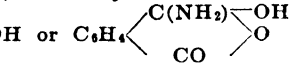
phrynin A poisonous protein obtained from the skin secretions of toads (See *bufonin*)

phthalal The tetravalent radical, =CH C_6H_4-CH=

phthalaldehyde Phthalic aldehyde

phthalaldehydic acid $C_8H_6O_3$ = 150 1 Ortho-aldehyde benzoic acid, o-formylbenzioc acid, $C_6H_4(CHO)COOH$ Colorless crystals, m 97, used in organic synthesis **5 6-dimethoxy-** Opianic acid **5 6-dioxy-** Noropianic acid

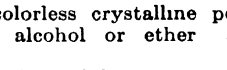
phthalamic acid $C_8H_7O_3N$ = 165 1 Phthalaldehyde acidamide, o-carbamylbenzoic acid

$C_6H_4(CONH_2)COOH$ or 

Colorless crystals, m 148, soluble in alcohol **phenyl-** Diphenamic acid

phthalamide Phthaldiamide

phthalanil $C_{14}H_9O_2N$ = 223 1 *N*-phenyl-phthalimide

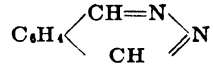


sym- A colorless crystalline powder, m 220 soluble in alcohol or ether **asym-** m 208 (sublimes)

phthalanone Phthalide

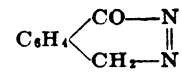
phthalate A salt of phthalic acid containing the divalent $C_6H_4(COO)_2$= radical, used for buffers (q v), standard solutions and in vacuum pumps (q v) **diamyl-** $C_{18}H_{26}O_4$ = 306 2 $C_6H_4(COOC_5H_{11})_2$ A colorless liquid, d 1 023, b 340, used as plasticizer **dibutyl-** $C_{16}H_{22}O_4$ = 278 2 A colorless liquid, d 1 046, m −35, b 340 Used as plasticizer **diethyl-** $C_{12}H_{14}O_4$ = 222 2 A colorless liquid, d 1 119, b 290, used as plasticizer

phthalazine $C_8H_6N_2$ = 130 1 β-benzo-o-diazine, β-phenodiazine, 2 3-benzodiazine



Colorless crystals, m 91, b 316, soluble in alcohol or ether **benzo-** See *benzophthalazine* **dihydroketo-** Phthalazone **oxy-** Phthalazone **tetrahydro-** $C_8H_{10}N_2$ = 134 1 The 1 2 3 4-tetrahydro derivative of phthalazine

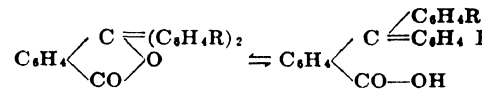
phthalazone $C_8H_6ON_2$ = 146 06 1-oxyphthalazine, dihydroketophthalazine



Colorless crystals, m 183, b 337, soluble in alcohol or ether, used in organic synthesis **benzyl-** Benzylphthalazone

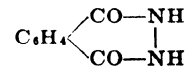
phthaldiamide $C_8H_8O_2N_2$ = 164 2 Phthalamide, phthalic diamide $C_6H_4(CONH_2)_2$ A crystalline powder, m 220 (decomp), insoluble in water, soluble in alcohol

phthaleins A group of intensely-colored organic compounds and dyes derived from phthalophenone by the substitution of its hydrogen atoms by hydroxyl or amino groups They are prepared by fusing phthalic anhydride with phenols, and are related to the colorless leuko-compounds (phthalines) (See *phthalein indicators, phenolphthalein, fluorescein*)



where R is OH or NH_2, and R′ is =O or =NH in the para position Cf *indicators* **cresol-sulfon-** See *cresol red, cresol purple* **phenol-** See *phenolphthalein* **phenolsulfon-** Phenol red **phloroglucinol-** Gallein **resorcinol-** Fluorescin **thymolsulfon-** Thymol blue

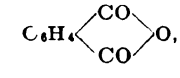
phthalhydrazide $C_8H_6N_2O_2$ = 162 05



3-**amino-** Luminol

phthalic acid $C_8H_6O_4$ = 166 1 Alizarinic acid, *1 2*-benzenedicarboxylic acid*, ortho-benzene-dicarboxylic acid, $C_6H_4(COOH)_2$ Colorless rhombic crystals, d 1 58, m 213, slightly soluble in water, soluble in alcohol or ether, used in organic synthesis and in the manufacture of dyes **iso-** Meta- Colorless needles, m 300 (sublimes) **meta-** Isophthalic acid **ortho-** [Ordinary phthalic acid **para-** Terephthalic acid **tere-** or para- Terephthalic acid **dimethoxy-** Hemipinic acid **dimethyl-** Cumidic acid **homo-** See *homophthalic acid* **hydroxy-** See *hydroxyphthalic acid* **hydroxymethyl-** Coccinic acid **methyl-** See *xylidic* and *uvitic acid*

p a series A group of organic acids of the general formula $C_nH_{2n-8}(COOH)_2$ Cf *aromatic acids* **p aldehyde** $C_6H_4(CHO)_2$ = 134 09 Phthalaldehyde, *1 2*-benzenedicarbonal* It exists in forms corresponding with those of phthalic acid *ortho-* m 52 *iso-* m 89 *tere-* m 116 **p anhydride** $C_8H_4O_3$ = 148 07 Phthalandione

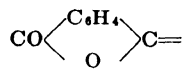


obtained by heating phthalic acid Large white prisms, d 1 527, m 128, b 284, slightly soluble in water, soluble in alcohol or ether, used extensively in organic synthesis *dimethoxy-* Hemipinic anhydride **p amide** Phthaldiamide **p diamide** Phthaldiamide **p nitrile** Phthalonitrile

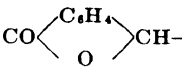
phthalide $C_8H_6O_2$ = 134 09 Isobenzofuranone, *1*-phthalanone The heterocyclic compound,

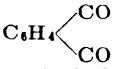
and anhydride of o-hydroxy-methylbenzoic acid Colorless crystals, m 68, b 290, soluble in alcohol or ether **acetoxy-** See *acetoxyphthalide* **benzal-** See *benzalphthalide* **benzilidene-** Benzalphthalide **bisbihydroxyphenyl-** Phenolphthalein **bisbihydroxytolyl-** Cresolphthalein **diindyl-** Indophthalein **dimethoxy-** Meconin **xanthilidene-** Fluoran

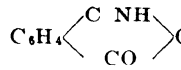
phthalidene The bivalent radical,



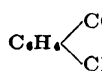
phthalidyl The monovalent radical,



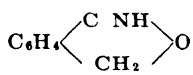
phthalimide $C_8H_5O_2N$ = 147 1 *o*-Phthalic imide, *1 3*-isoindoledione The heterocyclic compound,  , obtained by treating phthalic anhydride with ammonia Colorless crystals, m 228 (sublimes), used in organic synthesis **iso-** A tautomer of phthalamide,



phthalimidine C_8H_7ON = 133 1 *1*-Isoindolinone The heterocyclic compound,

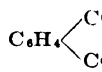


Colorless crystals, m 150, b 337, soluble in alcohol or ether, used in organic synthesis **pseudo-** The heterocyclic compound



benzyl- See *benzylphthalimidine*

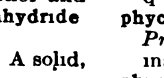
phthalimido The monovalent radical,



phthalines A series of colorless compounds which, on reduction, form phthaleins

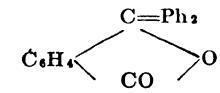
phthalizine Phthalazine

phthalocyanins A group of colored compounds related to the porphyrins, (q v), containing 4 isoindole rings linked in a 16-membered ring of alternate C and N atoms around a central atom, usually a metal (Cu or Fe) Cf *porphin, monastral blue*

phthalonic acid. $C_9H_6O_5$ = 194 1 Carbobenzoylformic acid, *o*-carboxyphenyl glyoxylic acid $COOH\,C_6H_4CO\,COOH\,2H_2O$ White crystals, m 140, soluble in water, alcohol and ether Cf *terephthalonic acid* **p anhydride** $C_9H_4O_4$ = 176 03  A solid, m 186

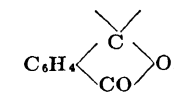
phthalonitrile $C_8H_4N_2$ = 128 05 Dicyanobenzene, $C_6H_4(CN)_2$ **m-** Isophthalic nitrile Colorless crystals, m 161 **p-** Terephthalic nitrile Colorless crystals, m 222 **homo-** Cyanobenzyl cyanide **iso-** m- **tere-** p-

phthalophenone $C_{20}H_{14}O_2$ = 286 21 Benzoylbenzophenone, diphenylphthalein The anhydride of the hypothetical triphenyl-carbinol-o-carboxylic acid, and parent substance of the phthaleins and phthalins



Colorless **leaflets**, m 115, slightly soluble in water, soluble in alcohol or ether, used in organic synthesis **dihydroxy-** Phenolphthalein

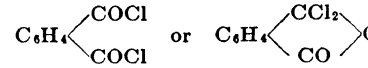
phthaloyl The bivalent radical,

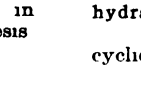


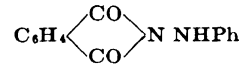
derived from phthaleins or phthalophenone

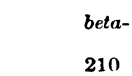
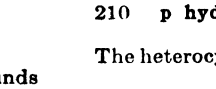
phthaluric acid $C_{10}H_7O_4N$ = 205 1 A colorless crystalline substance, m 192

phthalyl The bivalent radical, $C_6H_4(CO)_2{=}$, derived from phthalic acid **di-** See *diphthalyl* **p alcohol** *1 2*-Xylenediol **p chloride** $C_8H_4O_2Cl_2$ = 202 99 *1 2*-Benzenedicarbonyl chloride* *ortho-* A colorless oily liquid, b 276, soluble in ether, ether



meta- m 41, b 275, *para-* m 77, b 260 **p hydrazine** $C_8H_6O_2N_2$ = 162 1 The heterocyclic compound,  Colorless crystals, m 200 **p phenylhydrazide** $C_{20}H_{18}O_2N_4$ = 346 3 $C_6H_4(CO\,NH\,NHPh)_2$ Colorless crystals, m 161, used in organic synthesis **p phenylhydrazine** $C_{14}H_{10}O_2N_2$ = 238 10 *alpha-*



Colorless crystals, m 178, soluble in alcohol *beta-*  Colorless crystals, m 210 **p hydroxamic acid** $C_8H_6O_3N$ = 163 05 The heterocyclic compound, 

Colorless crystals, m 230, slightly soluble in water soluble in alcohol or ether

phthioic acid $C_{26}H_{52}O_2$ = 396 35 A saturated fatty acid, m 48, from human and avian tubercle bacilli, an isomer of cerotic acid

phthoric acid An obsolete name for hydrofluoric acid

phtiocol A pigment associated with carotene, q v

phycinic acid An acid obtained from the alga *Protococcus vulgaris* White, needles, m 136, insoluble in water, soluble in alcohol

phycite Erythritol

phycocerythrin A globulin

phycochrome A bluish-green, chlorophyll-like pigment in various fresh water algae

phycocyanin A blue pigment in the Cyanophyceae, or blue-green algae, active in photosynthesis

phycoerythrin The red pigment of the Florideae, or brown algae, active in photosynthesis

phycology A branch of botany dealing with seaweeds or algae

Phycomycetes An order of thallophytes (q v), algal fungi

phycophaein The brown pigment of certain algae

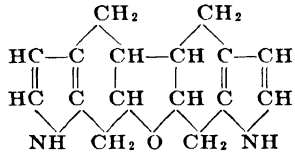
phyllanthin $C_{30}H_{37}O_8$ = 525 3 A glucoside from *Phyllanthus niruri*, an Euphorbiaceae Colorless needles, insoluble in water, soluble in alcohol or ether

phyllins The derivatives of chlorophyll

phyllite Chloritoid

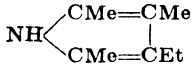
phylloerythrin A split-product of chlorophyll occurring in the stomachs of herbivorous animals, and identical with the porphyrin of human feces Cf *chlorophyll-a*, *porphin ring*

phylloporphyrin $C_{16}H_{18}ON_2$ = 254 2 A split-product of chlorophyll



See *porphyrin*, *porphin ring*

phyllopyrrole $C_9H_{15}N$ = 137 1 A pyrrole fragment of the porphin ring, q v,



White plates, m 69, b 87

phylloquinones See *vitamin K*

phyllyrin $C_{24}H_{34}O_{11}$ = 498 3 Colorless shining leaflets, used as an antipyretic

phylo- See *phyllo-*

phylum One of the primary divisions of the animal or plant kingdom The animal kingdom is divided into twelve, and the plant kingdom into four phyla

physalin $C_{72}H_{116}O_4$ = 1045 0 A carotinoid pigment found in the sepals of *Physalis alkekengi* and *Ph franchetti*, winter cherry, and in the berries of *Lycium halimifolium*, goats thorn A yellowish powder, slightly soluble in water, soluble in alcohol or ether

physalite The mineral Al_2O_3, SiO_2

physcic acid Physcion

physcion $C_{16}H_{12}O_5$ = 284 09 Physcic acid, chrysophyscin, parietin A crystalline* principle, m 207, from the lichen, *Parmelia* (*Physcia*) *parietina*

physeteric acid $C_{14}H_{26}O_2$ = 226 2 *5 6*-Tetradecenoic acid*, $Me(CH_2)_7CH\ CH(CH_2)_3COOH$ A constituent of sardine and whale oils

physetoleic acid $C_{16}H_{30}O_2$ = 254 24 Hypogaeic acid An unsaturated acid of the oleic acid series, $C_{15}H_{29}COOH$, and a constituent of tallow A white waxy mass, m 30, insoluble in water, soluble in alcohol

physic (1) Medicine (2) Cathartic Purgative (3) Puddling or working molten iron in order to remove impurities

physical Pertaining to physics or the energy-relations of substances **p analysis** Testing or determining the physical properties of a material **p chemistry** A branch of science that deals with the physical properties of substances and employs physical methods, either experimental or theoretical, to solve chemical problems It is subdivided into electro-chemistry, thermo-chemistry and thermodynamics, optical methods, radiochemistry and photochemistry **p properties** Properties which can change without involving a change in chemical composition, as, melting point, boiling point, density, atomic weight, atomic distance, optical refractivity, conductivity, compressibility, etc **p solution** A solution from which the solute can be recovered chemically unchanged **p test** A mechanical test to determine mechanical properties, as, hardness, compressibility

physicochemical Pertaining to physical chemistry

physics The science of energy A branch of science that deals with the phenomena produced by forces acting upon matter, and the changes and transformations occurring in Nature that do not involve a change in the composition of the material Thus, in its broadest sense it deals with the fundamental laws of the material universe Physics is conventionally subdivided into mechanics, heat, electricity, magnetism, light, and radioactivity A more elaborate classification is

Theoretical Physics

The doctrine of the *cause* of physical phenomena, or the purely abstract aspect of force and motion

1 Dynamics—The motion of bodies
  a kinematics, or the types of possible motions without consideration as to cause
  b kinetics, or the relation of motion to force
  c statics, or forces that produce equilibrium
  d energetics, or the transmission of forces
2 Mass-Physics—The mechanics of bodies, as work and energy, gravitation, vibrations (sound)
3 Molecular-Physics—The motion of molecules as shown in the phenomena of temperature and states of aggregations
4 Atomic-Physics—The motion of atoms, their disintegration and structure
5 Ether-Physics
  a ether vibrations—radiant energy
  b ether stress—electro-statics
  c ether vortices—magnetism
  d ether flow—electro-kinetics
  e ether radiation—electric and heat waves
6 Astro-physics The interpretation of stellar spectra and the measurement of stellar radiations

Practical Physics

The doctrine of the *appearance* of physical phenomena, or the experimental basis of our physical knowledge

1 Mechanics—the relation of matter to force
  a dynamics—the action of forces on bodies in general
  b hydraulics—the forces acting on and in liquids
  c pneumatics—the action of forces on gases
  d acoustics—the production and transmission of sound waves
2 Optics—the nature and properties of light

3 **Thermodynamics**—the relationships of heat and energy
4 **Electrostatics**—static or stationary electric charges
5 **Electrodynamics**—moving charges, or an electric current

Applied Physics

The study of the *effects* of physical phenomena on or their application to the welfare and comfort of man

1 Engineering concerned with the direct welfare of man
   a Structural E —the construction of buildings
   b Sanitary E —The disposal of waste and refuse
   c Agricultural E —the methods of increasing crops by irrigation rapid harvesting etc
2 Engineering concerned with the production of objects
   a Mechanical E —the construction of machines and labor-saving devices
   b Mining E —the excavation of mines and the treatment of ores
   c Chemical E —The production of chemicals and useful substances
3 Engineering applied to transport and transmission
   a Civil E —the construction of roads and bridges
   b Hydraulic E —the utilization of water power
   c Steam E —the construction and operation of steam engines and heating plants
   d Electrical E —the construction and operation of electrical machines and transmissions
   e Railroad E —The construction and operation of railroads and terminals
   f Marine E —The construction and operation of ships and wharves
   g Aerial E —The construction and operation of airships and aeroplanes, hangars and landing-fields

classical- The branch of p dealing with the mechanical, thermal, optical and electrical properties of matter **modern-** The branch of p dealing with the relations among atoms, electrons, photons, quanta and radiation

physiochemical Biochemical

physiography Physical geography The study of the general properties of our earth and atmosphere

physiological Pertaining to the functions and activity of living organisms (plants, animal and man), especially in their normal condition, as opposed to their diseased (pathological) state **p action** The effect of a substance on living organisms **p chemistry** A branch of science that studies the chemical changes in normal living organisms (plant, animal or man), especially the chemical activity of the normal protoplasm **p salt solution** (1) Normal saline An isotonic solution of sodium chloride in water, usually 9 grams per liter (2) A solution of salts in water resembling the salts of normal blood serum and consisting of

0 25 gm calcium chloride,
0 10 gm potassium chloride,
9 00 gm sodium chloride,
1000 00 cc water

physiology A branch of science that deal with the functions and biological activitie of living organisms, such as, respiration metabolism reproduction and growth **animal** The functions of the animal organism an its parts **human-** The functions of th human organism, apart from its mental aspect **plant-** The functions of plants and their organs **phyto-** Plant p **zoo-** Animal p

physite Erythrol

physostigma Calabar bean The dried ripe seeds of *Physostigma venenosum*, a Leguminosa of Africa, which contains the alkaloids, physostigmine, eseridine and calabarine Used in medicine as the fluid extract, as an antineuralgi and antitetanic

physostigmine $C_{15}H_{21}O_2N_3$ = 275 3 Eserine An alkaloid from the seeds of *Physostigma*, q v Colorless crystals, m 106 darkening with age slightly soluble in water, soluble in alcohol ether or chloroform Used medicinally as an antitetanic and peristaltic, also in ophthalmology and veterinary medicine **p benzoate** $C_{23}H_{27}O_6N_3$ = 441 4 Eserine benzoate Hard white crystalline masses, soluble in water o alcohol **p borate** Eserine borate White crystalline powder, soluble in water or alcohol used in ophthalmology **p citrate** $(C_{15}H_{21}O_2N_3)_3C_6H_8O_7$ = 1017 66 Eserine citrate White crystalline powder, soluble in water o alcohol **p hydrochloride** $C_{15}H_{21}O_2N_3$ HCl = 311 8 Eserine hydrochloride Colorless powder, soluble in water or alcohol **p salicylate** $C_{15}H_{21}O_2N_3C_7H_6O_3$ = 413 3 Eserine salicylate The most frequently-used form o physostigmine Colorless or pale yellow, shining crystals, m 178, soluble in water, or alcohol used medicinally as a miotic, antitetanic an peristaltic **p sulfate** $(C_{15}H_{21}O_2N_3)_2H_2SO_4$ = 648 6 Eserine sulfate, physostigmina sulfas White or pale yellow, crystalline deliquescent powder, m 140 soluble in water alcohol, or chloroform, used medicinally as myotic

phyt-, phyto- A prefix derived from the Greek indicating 'plant" or "vegetable "

phytalbumin A vegetable albumin

phytane $C_{20}H_{42}$ = 282 28 A saturated hydrocarbon obtained by reduction of phytol A colorless, mobile liquid, b $_{10mm}$169, insoluble in water

phytase An enzyme derived from rice bran or barley that hydrolyses phytin to inosito and phosphoric acid

phytelephas The negrito palm, *P macrocarpa* of Eucador whose fruit yields corajo or vege table ivory Cf *tagud nut*

phyterythrin The red coloring matter of plants especially of leaves in autumn

phytic acid $C_6H_6O_6(H_2PO_3)_6$ = 660 42 Inositol hexaphosphoric acid An amorphous powder, d 1 175, m 214, slightly soluble in water It is widely distributed in plant seeds

phytin The calcium salt of phytic acid (calcium inositol hexaphosphoric ester) derived from numerous seeds (hemp, sunflower, peas, beans) used as the calcium or magnesium salt as nutrient in rickets, anemia, and tuberculosis

phytochemistry A branch of science that deal with chemical changes occurring in vegetabl organisms or plants

phytochrome The general name for the colorin materials of plants necessary for their synthetic metabolism, as, chlorophyll

phytol $C_{20}H_{39}OH$ = 296 3 *3 7 11 15*-Tetramethyl-*2*-hexadecen-*1*-ol* An unsaturated alcohol derived from chlorophyll, $Me[CHMe(CH_2)_3]_3CMe\ CH\ CH_2OH$ A colorless oil, d 0 864, b $_{10mm}$203, and a polymer of isoprene

phytolacca Poke root The dried root of *P decandra*, a Phytolaccaceae, used as the fluid extract, as an alterative and emetic **p berries** Poke berries

phytolaccic acid An acid derived from poke berries A yellowish-brown, amorphous, gummy mass, soluble in water or alcohol, slightly soluble in ether

phytolaccin A neutral principle obtained from the seeds of *Phytolacca* species Lustrous silky needles, insoluble in water, soluble in alcohol or ether, used medicinally as an alterative and laxative

phytolaccine An alkaloid obtained from the roots of *Phytolacca* species

phytolaccotoxin $C_{24}H_{38}O_8$ = 454 29 A toxic principle from *Phytolacca americana* of South Africa and America, and from the Japanese *Phytolacca acinosa*

phytopathology The study of the diseased conditions of plants

phytopharmacy The study of fungicides and insecticides

phytopyrrole See *chlorophyll*

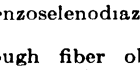
phytosterin Phytosterol

phytosterol (1) $C_{26}H_{44}O\ H_2O$ = 390 37 Phytosterin An isomer of cholesterol, m 135–144 in all vegetable fats (0 5–1 %) Its presence distinguishes vegetable from animal fats which contain cholesterol (2) Any sterol derived from plants, see *cholane derivatives* **p test** A test to distinguish vegetable fats from animal fats The saponified fats are extracted with ether, and the ether extract treated with glacial acetic acid The melting point of the acetates formed are phytosterol acetate, m 125–127 (vegetable fat), cholesterol acetate, m 114 (animal fat)

phytosterolin $C_{34}H_{56}O_6$ = 560 0 A glucoside, m 275–288 that yields phytosterol on hydrolysis

pi π (1) A mathematical constant which expresses the ratio of the circumference of a circle to its diameter, 3 1416, see *Ludolf's number* (2) A symbol for peri-, q v

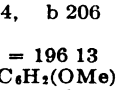
piaselenole $C_6H_4N_2Se$ = 183 3 Isobenzoselenodiazole The heterocyclic compound,



m 76 **iso-** Benzoselenodiazole **tolu-** Tolupiaselenole

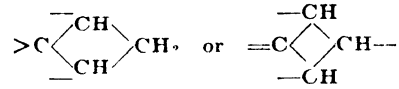
piassaba A tough fiber obtained from *Leopoldina piassaba* of Brazil, used for ropes **Bahia-** A fiber from *Attalea funifera* of Brazil

piazines Para-diazines A group of heterocyclic compounds having two N atoms in the para-position, as, pyrazine Cf *miazines, oiazines*

piazothiole $C_6H_4N_2S$ = 136 2 The heterocyclic thiodiazole  A colorless crystalline mass, m 44, b 206 **iso-** Benzothiodiazole

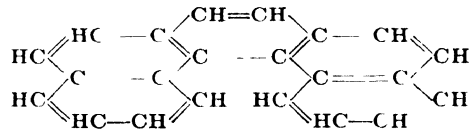
picamar $C_{11}H_{16}O_3$ = 196 13 Propylpyrogalloldimethylether, $C_6H_2(OMe)_2(OH)(C_3H_7)$, 1-propyl-2-hydroxy-3 4-dimethoxybenzene A colorless liquid, b 245, used in perfumery

picean nucleus Gem-dimethylcyclobutane ring A tetratomic ring in some terpenes



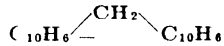
picein $C_{14}H_{18}O_7$ = 298 2 A glucoside from the leaves of the Norway spruce, *Picea excelsa*, and the bark of *Salix nigra*, willow, a Salicaceae It is the β-glucoside of *p*-hydroxyacetophenone White powder, m 194, soluble in water Cf *piceoside*

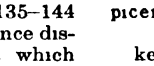
picene $C_{22}H_{14}$ = 278 2 Dibenzo[a1]-phenanthrene An aromatic and high-melting hydrocarbon obtained from coal tar



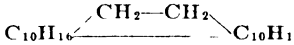
Blue fluorescent leaflets, m 364, b 519, insoluble in water or alcohol, soluble in cumene

picenefluorene $C_{21}H_{14}$ = 266 2 Dinaphthylenemethane, pycylenmethane An aromatic hydrocarbon



piceneketone $C_{21}H_{12}O$ = 280 1 The aromatic ketone, 

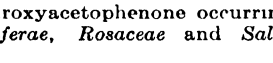
piceneperhydride $C_{22}H_{36}$ = 300 3 The saturated aromatic hydrocarbon do-eikosin-hydropicene (=22 hydrogen-picene),



Colorless crystals, m 175, insoluble in water soluble in alcohol

picenic acid $C_{21}H_{14}O_2$ = 298 11 A colorless solid, m 201

picenoquinone $C_{22}H_{12}O_2$ = 308 1 The ketone,



piceoside Salinigrin amelianoside A glucoside of *p*-hydroxyacetophenone occurring in species of *Coniferae, Rosaceae* and *Salicaceae* Cf *picein*

pichi The woody and resinous branches of *Fabiana imbricata*, a Solanaceae of Chile Used as the fluid extract, as a tonic and diuretic Cf *fabiana*

pichurim beans Sassafras nuts The seeds of *Nectandra puchury*, a Lauraceae of Brazil and Venezuela, used as an aromatic **p camphor** $C_{12}H_{24}O_2$ = 200 2 An aromatic substance obtained from p beans, resembling laurel camphor **p fat** The fatty matter of p beans, containing 30 % laurostearin and p camphor, used in flavoring extracts

pickeringite A native magnesia alum, $MgAl_2(SO_4)_4\ 22H_2O$, long fibrous masses

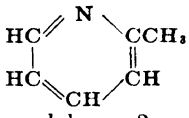
pickle (1) A bath of dilute acids, used to remove oxides, carbonates or other scales from metals (2) A fruit or vegetable preserved in spiced vinegar **p inhibitor** A substance added to a p (1) to restrain its corrosive action

pickling To clean sheet iron or metallic utensils by immersion in (usually sulfuric or nitric) acid

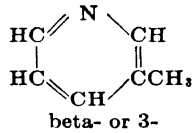
picknometer, picnometer Pyknometer

picoampere 0 001 milliampere

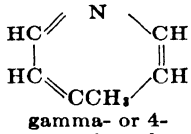
picoline C_6H_7N = 93 1 Methylpyridine A series of homologs of pyridine C_5H_4N Me, obtained by the dry distillation of bones and coal **alpha-** A colorless liquid, d 0 952, m −69, b 128,



alpha- or 2-methylpyridine



beta- or 3-methylpyridine



gamma- or 4-methylpyridine

soluble in water or alcohol, used medicinally as a nerve sedative Cf *picolinic acid uvitonic acid* **beta-** A colorless liquid, d 0 977 b 144, soluble in alcohol **gamma-** A colorless liquid d 0 974, b 147, soluble in water **tetrahydro-** The saturated compound $C_5H_8N\,CH_3$ = 97 1 A colorless liquid b 132 Cf *uvitonic acid*

picolinic acid $C_5H_4N\,COOH$ = 123 1 Pyridine carboxylic acid* Colorless needles m 136, soluble in water, alcohol or ether

picolyl The monovalent radical $C_5H_4NCH_2$—, derived from picoline

picotite The mineral MgO,Al_2O_3, with Fe and 7 % CrO_3

picraconitine Picroaconitine

picradonidin A glucoside obtained from *Adonis* species Ranunculaceae, it has a digitalis-like action

picramic acid $C_6H_5O_5N_3$ = 199 1 Dinitrophenamic acid *2*-amino-*4 6*-dinitrophenol*, 4 6 - 2-picramic acid 4 6 2 1-dinitroaminophenol, $(NO_2)_2(NH_2)C_6H_2(OH)$, 1-hydroxy-2-amino-4 6-dinitrobenzene Colorless monoclinic crystals m 168, insoluble in water but soluble in alcohol or ether, used in organic synthesis

picramide $C_6H_4N_6O_4$ = 228 1 1 2 4 6-trinitroaniline, picrylamine, $C_6H_2(NH_2)(NO_2)_3$ Yellowish leaflets, m 186, insoluble in water or alcohol, soluble in acetic acid **methylnitro-** Tetryl

picramnine An alkaloid from the bark of *Picramnia antidesma*, a Simarubaceae (Honduras bark)

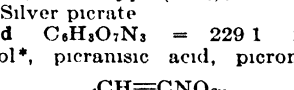
picranisic acid Picric acid

picrasmine $C_{35}H_{46}O_{10}$ = 626 5 A principle from the wood of *Picrasma quassioides*, a simarubaceous tree of the Himalayas

picrate Carbazotate A highly-explosive salt of picric acid, of the type $(NO_2)_3C_6H_2OM$

picratol Silver picrate

picric acid $C_6H_3O_7N_3$ = 229 1 2 4 6-Trinitrophenol*, picranisic acid, picronitric acid,



chrysolepic acid Lemon-colored leaflets, d - 1 767, m 122, which explode on further heating, slightly soluble in water, soluble in alcohol or ether Used as a reagent in analytical chemistry and microscopy, to precipitate proteins, and in the manufacture of explosives and dyes Cf *lyddite*

picrin A bitter principle obtained from *Digitalis purpurea*, a Scrophylariaceae **bromo-** Nitrobromoform

picro- A prefix derived from the Greek, indicating "bitter"

picroaconitine $C_{31}H_{45}O_{10}N$ = 591 4 Picraconitine An amorphous bitter principle from the bulbs of *Aconitum napellus*, a Ranunculaceae

picroadonidine A bitter principle from *Adonis* species

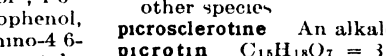
picrocarmine A stain for microscopic specimens 1 pt carmine, 5 pts ammonia, 50 pts water, and 50 pts saturated solution of picric acid

picrocrocin (1) $C_{36}H_{66}O_{17}$ = 794 49 Saffron bitter A glucoside from saffron (2) $C_{10}H_{14}O$ = 150 11 A ketone, b 209, from saffron Cf *pikrococin*

picroerythrin $C_{12}H_{16}O_7\,3H_2O$ = 344 2 A crystalline bitter substance, m 158, soluble in water, insoluble in alcohol

picrol $C_6H_3O_2I_2SO_3K$ = 479 7 Di-iodoresorcin potassium monosulfonate A colorless crystalline powder, soluble in water, alcohol or ether, used as an antiseptic

picrolonic acid $C_{10}H_8N_4O_5$ = 264 1 *3*-methyl-*4*-nitro-*1*-*p*-nitrophenyl-*5*-pyrazolone



A microreagent for calcium, with which it produces rectangular crystals

picromerite The mineral $(K\,Mg)SO_4\,xH_2O$

picronigrosin(e) An alcoholic solution of picric acid and nigrosine Used as a microscopic stain

picronitric acid Picric acid

picropodophyllin A crystalline principle from the *Podophyllum* species Cf *podophyllin*

picrorocellin $C_{27}H_{29}O_5N_3$ = 475 3 A crystalline bitter principle from *Rocella tinctoria* and other species

picrosclerotine An alkaloid from ergot

picrotin $C_{15}H_{18}O_7$ = 310 1 A decomposition-product of picrotoxin, m 240

picrotone $C_{14}H_{16}O_3$ = 232 1 A ketone derived from picrotoxin

picrotonol $C_{14}H_{16}O_4$ = 248 1 An α-ketol, and degradation-product of picrotoxin

picrotoxin $C_{30}H_{34}O_{13}$ = 602 3 A neutral principle from the fruit of *Anamirta paniculata* (or *Cocculus indicus*, fishberries) resembling strychnine in its action White, flexible, shining needles, m 200, soluble in alcohol water, or ether, hydrolyzed to picrotin and picrotoxinin, used in medicine

picrotoxinin $C_{15}H_{16}O_6\,H_2O$ = 310 2 A decomposition-product of picrotoxin Colorless crystals, m 201 soluble in water

picryl The monovalent radical, $C_6H_2(NO_2)_3$—, derived from picric acid **p amine** Picramide **p chloride** $ClC_6H_2(NO_2)_3$ = 247 54 (1) *1*-chloro-*3 5 2*-trinitro-benzene Yellow prismatic crystals, m 81, insoluble in water, soluble in alcohol or ether, used in the manufacture of explosives (2) *1*-chloro-*2 4 5*-trinitrobenzene, m 116

Pictet, Amé 1857–1937 A Swiss chemist noted for his work on vegetable alkaloids **P crystals** White crystals formed when liquid sulfur dioxide evaporates, and supposed to be $SO_2 - xH_2O$ **P, Raoul** 1842– A Swiss chemist who liquefied O, N, H and CO_2 at −140°C

pictol Metol

picylene Picenefluorene

piedmontite. The mineral, $4CaO,3(AlMn)_2O_3$-$6SiO_2,H_2O$

pieso- Piezo-

piezo- A prefix derived from the Greek, indicating "pressure"

piezochemistry The study of chemical reactions under high pressure

piezocontrol The maintenance of a definite radio frequency with a quartz oscillator Cf *piezoelectricity*

piezocrystallization Crystallization under great pressure, as, in certain rocks

piezoelectricity A phenomenon in which an electric current is produced as the result of pressure exerted on certain crystals, such as quartz, mica, tourmaline and calcite It is the reverse effect of electrostriction Cf *quartz oscillator*

piezoelectron A supposedly disk-shaped electron pressed between two petalons

piezometer An instrument for determining the compressibility of a substance

pig A cast bar or brick made of metal **p iron** A crude, cast iron, molded in sand **p lead** A cast bar of lead **p tin** A cast bar of tin

pigment (1) A finely-powdered, insoluble white, black or colored material, used, suspended in a vehicle, as a paint, or ink Classification (a) according to source

mineral pigments, as ochre,
animal pigments, as carmine,
vegetable pigments, as madder-lake,
synthetic or artificial pigments, *e g*, monastral blue

(b) according to their chemical composition

1 elements, as carbon black
2 oxides, as ferric oxide
3 sulfides, as cinnabar
4 hydroxides, as ferric hydroxide
5 carbonates, as lead carbonate
6 silicates, as manganese silicate
7 chromates, as lead chromate
8 sulfates, arsenates, and other inorganic salts
9 organic compounds, as prussian blue, or gamboge

(c) according to color (2) A coloring matter in the tissues of plants or animals, as, the chromoproteins Cf *cytochrome, lipochrome, bilepigments, flavones, anthocyanins* **carotenoid-** See *carotenoids* **p dye** An insoluble dye which does not form lakes **p green** A green color prepared from an iron salt and nitroso-β-naphthol

pigmentation The coloration or discoloration of part of a living organism by a deposit of coloring matter

pigmented Describing an organ or part of an organism, stained by a deposit of pigment

pigmentolysis The dissolution or destruction of a coloring matter in an organism

pikrococin $C_{16}H_{28}O_8 = 313\ 2$ A glucoside of safranal in saffron,

$(C_6H_{10}O_5)$ CH CH_2 CMe_2 C(CHO) CMe CH_2

Cf *picrocrocin*

pilchardine A commercial blend of oils from pilchard, sardine and grey-fish

pile A bundle or stack **galvanic-** Voltaic p **thermo-** A number of sheets or bars, composed of two or more metals, that produce an electric current when heated at their junctions of contact **voltaic-** A series of metallic disks, forming a galvanic battery

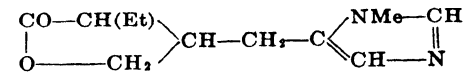
pilewort Lesser celandine, *Ranunculus ficaria*, used as ointment

piliganine $C_{18}H_{24}ON_2 = 248\ 3$ An alkaloid from piligan, *Lycopodium saururus*, a South American club moss A yellow amorphous powder, insoluble in water

pill (1) A small uncoated or coated round mass, consisting of a mixture of an active drug and inert material, used in medicine It differs from tablets, which are compressed and disk shaped (2) A pellet of cesium, which is introduced into a vacuum tube and "flashed" to remove all oxygen

pilocarpidine $C_{10}H_{14}N_2O_2 = 194\ 2$ An alkaloid obtained from the leaves of *Pilocarpus* Dihydroxylnicotine, C_5H_4N CMe(NMe_2) COOH A colorless syrup-like liquid or colorless crystals, insoluble in water **p nitrate** $C_{10}H_{14}N_2O_2$-$HNO_3 = 257\ 2$ Colorless crystals, soluble in water

pilocarpine $C_{11}H_{16}O_2N_2 = 208\ 2$ An alkaloid from the leaves and stalks of jaborandi (see *pilocarpus*)



Colorless needles, m 34, slightly soluble in water, soluble in alcohol Used as its salts in medicine, as it increases saliva and sweat, constricts pupils and decreases intraocular tension **p hydrochloride** $C_{11}H_{16}O_2N_2$ HCl = 244 67 Colorless, hygroscopic needles, m 194, soluble in water or alcohol **p nitrate** $C_{11}H_{16}$-O_2N_2 HNO_3 = 271 2 Pilocarpinae nitras Colorless crystals, m 178, soluble in water or alcohol, insoluble in ether, used in medicine **p phenate** $C_{11}H_{16}O_2N_2$ C_6H_5OH = 302 2 Aseptolin A colorless oily liquid, soluble in water or alcohol **p salicylate** $C_{11}H_{16}N_2O_2$-$C_7H_6O_3 = 346\ 20$ White crystals, m 120, soluble in water **p sulfate** $(C_{11}H_{16}N_2O_2)_2$ H_2SO_4 = 514 33 Colorless crystals, m 133

pilocarpus Jaborandi The dried leaflets of *Pilocarpus pennatifolius*, and other species, a rutaceous shrub of tropical America It contains 0 6 % alkaloids, and is used as the fluid extract, as a diaphoretic

pilocereine Pilocerine

pilocerine $C_{30}H_{44}O_4N_2 = 496\ 5$ An alkaloid from a cactus, *Cereus pilocereus*

pilosine $C_{16}H_{18}N_2O_2 = 286\ 16$ An alkaloid from pilocarpus MeN CH N CH C CH_2-CH CH_2 O CO CH CHOH Ph White crystals, d 1 168 m 187

pilosinine $C_9H_{12}N_2O_2 = 180\ 11$ An alkaloid from pilocarpus

MeN CH N CH C CH_2 CH CH_2 O CO CH_2

White crystals, m 79, b $_{35mm}$300

pilot burner A small burner that is kept permanently alight, and is attached to a larger burner for relighting purposes

pilot flame The small flame of the pilot burner

pilot plant An experimental assembly of manufacturing equipment to try out a new process on the semi-large scale

pimanthrene $C_{16}H_{14}$ = 206 1 *1 7*-Dimethylphenanthrene A hydrocarbon from copal and pimaric acid

pimaric acid $C_{20}H_{30}O_2$ = 302 3 An optically-active acid from burgundy pitch and galipot resin A crystalline mass, m 148 (inactive), soluble in hot alcohol or ether (see *abietic acid*) **dextro-** m 210 **laevo-** m 145

pimelic acid $C_7H_{12}O_4$ = 160 12 1 5-pentane dicarboxylic acid, heptanedioic acid* The sixth member of the oxalic acid series, $CH_2(CH_2CH_2COOH)_2$ A solid, m 105, b $_{100mm}$272, soluble in alcohol or ether

pimelinketone Cyclohexanone*

pimelite A native green nickel-iron silicate, similar to meerschaum

pimenta Allspice, Jamaica pepper The dried fully grown, unripe and powdered fruit of *Pimenta officinalis*, a Myrtaceae of the tropics Used as a condiment, for flavoring, and medicinally as an aromatic stimulant **p oil** Allspice oil A pale yellow oil distilled from the pimenta of the West Indies, d 1 05, insoluble in water, soluble in alcohol or ether Used in perfumery and for flavoring extracts

pimpinella The dried roots and rhizomes of *Pimpinella saxifraga* or other species, an umbelliferous plant, used medicinally, as the fluid extract, as a diuretic

pimpinellin $C_{13}H_{10}O_5$ = 246 1 A bitter crystalline principle from pimpinella Colorless needles, insoluble in water, soluble in alcohol

Pinaceae Pine family, a group of trees and shrubs with a resinous juice and awl- or needle-shaped leaves The following plants of this family yield drugs

Abies balsamea (Canada fir)	Canada balsam
Abies (*Tsuga*) *canadensis* (hemlock spruce)	Canada pitch
Abies (*Picea*) *excelsa* (Norway spruce)	Burgundy pitch
Agathis dammara	kauri gum
Dammara orientalis	dammar gum
Callitris quadrivalvis	sandarac
Juniperus sabina (sabina)	savine oil of savine
Juniperus communis (juniper)	juniper berries juniper oil
Juniperus oxycedrus	cade oil
Larix laricina (hackmetack)	tamarac
Pinus alba (white pine)	white pine bark fluid extract
Pinus pumelio (dwarf pine)	dwarf pine needles oleum pini pumilionis
Pinus sylvestris (Scotch fir)	wood tar
Pinus palustris (common pine)	turpentine colophony tar tar oil
Thuja occidentalis (arbor vitae)	thuja fluid extract

Cf *Abies, Agathis, abietene, cedar oil, cypress oil, larixine*

pinachrome $C_{26}H_{29}IN_2O_2$ = 528 2 p-ethoxy quinaldine-p-ethoxy-quinoline-ethyl-cyanine An indicator from pH 5 8 to 7 8, colorless in acid, red-violet in alkaline solutions

pinacoid See *pinakoid*

pinacol $C_6H_{14}O_2$ = 118 14 Tetramethylethyleneglycol, pinacone, 2 3-dimethyl-2 3-butanediol*, $Me_2C(OH)—C(OH)Me_2$ Colorless crystals, m 38, b 172, slightly soluble in water, soluble in alcohol **p condensation** An organic reaction in which two aldehydes or two ketones are reduced and linked together as in the formation of pinacol from acetone

$$2Me_2CO + H_2O = Me_2COH—COHMe_2$$

p conversion An intramolecular transfer of a methyl group from one carbon to another carbon atom, as in the change from pinacol to pinacoline (glycol to ketone)

$$Me_2C(OH)—C(OH)Me_2 \rightarrow Me_3C\,COCH_3$$

pinacolin $C_6H_{12}O$ = 100 1 tert-butylmethylketone *3 3*-dimethyl-*2*-butanone*, $Me\,CO\text{-}CMe_3$ A colorless oily liquid of peppermint-like odor, b 106 very slightly soluble in water, soluble in alcohol or ether

pinacolines A group of ketones, which contain a tertiary alkyl group, of the type, $R\,CO\,CR_3$

pinacolone Pinacolin

pinacols A group of diatomic alcohols or glycols, of type $R\,C(OH)\,C(OH)R_2$

pinacolyl alcohol $C_6H_{14}O$ = 102 11 *3 3*-Dimethyl-*2*-butanol*, methyl-*tert*-butylcarbinol $CMe_3\,CHOH\,Me$ A colorless liquid, d 0 812, m 5 5, b 121, slightly soluble in water

pinacone Pinacol

pinacones See *pinacols* **p rearrangement** See *pinacol conversion*

pinacyanol $C_{25}H_{25}N_2I$ = 480 9 A carbocyanin dye used for sensitizing photographic plates to red and as histological stain

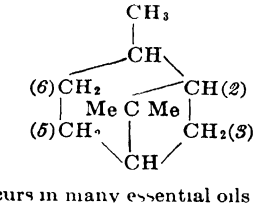
pinaflavole An isocyanin dye, used as photosensitizer for green

pinakoid A prism crystal face intersecting one axis of the system, and parallel to the other two **brachy-** A pinakoid intersecting the brachy (broad) axis **macro-** A pinakoid intersecting the macro (long) axis

pinakryptol A green dye, used as a photographic desensitizer

pinalic acid Valeric acid

pinan(e) $C_{10}H_{18}$ = 138 2 Bicyclo-(2 4)-heptane The terpene hydrocarbon,



which occurs in many essential oils Cf *pinene*

pinang *Areca* nut

pinaverdol $C_{21}H_{21}IN_2$ = 440 0 *1 6 1'*-Trimethylisocyanin iodide An isocyanin dye used in photography for sensitizing plates for the orange portion of the spectrum

pinch An approximate measure of 1 or 2 grams

pinchbeck A yellow alloy of copper (83 %) and zinc, (17 %), used as an imitation gold for jewellery

pinckneyin A glucoside from the bark of *Pinckneya pubens* a Rubiaceae

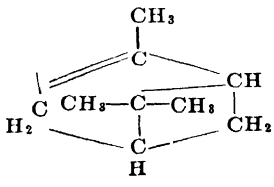
pine A general name for coniferous trees that yield turpentine resin, tar, and pitch **p camphor** Pinol **p oil** A crude turpentine obtained by distillation of pine wood **p cone oil** Turpentine **p leaf oil** An essential oil distilled from pine needles **p needle oil** Oleum pini An essential oil distilled from fresh pine needles, the leaves of *Pinus pumilio*

A colorless or faintly yellow liquid of pleasant odor, d 0 865–0 875, b 165, containing pinene, limonene and bornyl acetate, used medicinally as an inhalant **p tar** Wood tar **p tar oil** A reddish distillate from pine tar, d 0 97, insoluble in water, used in ore flotation

pineal gland A conical-shaped gland in the brain The dried and powdered glands of young cattle (1 gm of which is equal to 7 gm of fresh glands), used medicinally

pineapple The fruit of *Ananas sativus*, a Bromeliaceae, q v Cf *bromelin*

pinene $C_{10}H_{16}$ = 136 2 Australene, laurene 2 7 7-trimethyl-Δ^2-bicyclo [1 1 3] heptene A terpene or hydrocarbon in many essential oils, a chief constituent in oil of turpentine, savine, and fir A colorless aromatic liquid, d 0 859, m −50, b 155, slightly soluble in water, soluble in alcohol or ether **beta-** Nopinene



p hydrochloride $C_{10}H_{16}HCl$ = 172 65 An insoluble solid, m 134, b 210

pinguin Alantol

pinicortannic acid $(C_{16}H_{18}O_{11})_2 H_2O$ A tannin from the bark of Scotch fir, *Pinus sylvestris*, a reddish brown powder Cf *cortepinitannic acid*

pinipicrin $C_{22}H_{36}O_{11}$ = 476 4 A bitter principle from the needles or leaves of *Thuja occidentalis* and *Pinus sylvestris* Pinaceae

pini-pini The dried bark of *Jatropha urens*, an Euphorbiaceae of Brazil, used medicinally

pinitannic acid $C_{14}H_{16}O_8$ = 312 2 A yellowish-red tannic acid obtained from the wood of *Pinus sylvestris*

pinite (1) $C_6H_{10}O_5$ = 164 1 Hexahydropentahydroxybenzene A colorless substance, m 150, in the resin from *Pinus lambertiana* Cf *quercitol* (2) Pagodite **methoxy-** Quebrachitol

pinking See *knock*

pinkroot Spigelia

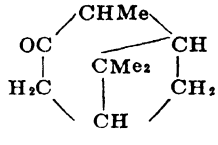
pinksalt $(NH_4)_2SnCl_6$ = 367 5 Tin-ammonium chloride, ammonium hexachlorostannate A pink crystalline mass, used in the textile industry as a mordant

pinnoite A native magnesium borate, MgB_2O_4

pinol $C_{10}H_{16}O$ = 152 13 Sobrerone, pine camphor, *6(8)*-methoxy-*1*-*p*-menthene A terpene, from pine needles which occurs in d- and l-forms A colorless liquid, d 0 952, b 183, insoluble in water, soluble in alcohol or ether **p hydrate** $C_{10}H_{16}O\ H_2O$ = 170 14 Sobrerol The terpene Δ 6-para-menthane-diol-2 8 Acids dehydrate it to pinol, m 150, b 270, soluble in water, alcohol or ether

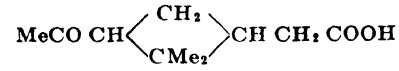
pinoline Rosin spirit

pinone $C_{10}H_{16}O$ = 152 2 6-oxypinol The terpene ketone



It is a constituent of many essential oils, and an isomer of α-thujone, camphor, fenchone and carone

pinonic acid $C_{10}H_{16}O_3$ = 184 12 An oxidation-product of pinene



d(l)- m 99, b $_{12mm}$180 *dl*- m 105 Cf *umbellonic acid*, *nopinic acid*

pinosylvin $C_{14}H_{12}O_2$ = 212 1 *3 5*-D hydroxy stilbene, m p 155 A constituent of the heartwood of the tree *Pinus sylvestris*

pint A measure of volume, dry and liquid **United States-**

1 pt = 0 5 quart = 0 125 gallon = 4 gills = 16 fl oz
= 28 875 in ^{3} = 128 fl dr = 7680 minims
1 pt = 0 473167 liter = 473 17 cc

British- Imperial- dry- 1 dry pt = 0 5506 cc **imperial-** British- 1 pt = 20 fl oz = 34 6593 in ^{3} = 568 25 cc **Scotch-** 1 Sc pt = 3 0065 imp pts

Pintsch gas A fuel gas made by spraying oil into a hot retort

Pinus An important genus of Coniferae (q v) which yield turpentine, galipot resin, pitch, tar, combopinic acid, ceropic acid, pinite, pinipicrin Cf *Pinaceae*, *Abies*

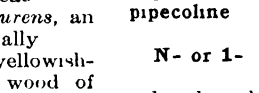
Piobert effect The surface markings which appear on polycrystalline specimens of iron and soft steel at or near the yield-point

pioscope A device for estimating colorimetrically the fat-content of milk

pipeclay A fine grayish-white grade of clay, similar to kaolin, used for heat-resisting apparatus and in the plastic state, as a whitening

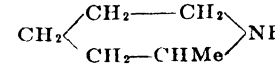
pipecoline $C_6H_{13}N$ = 99 1 Methylpiperidine

N- or 1-



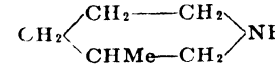
A colorless liquid d 0 818, b 107

α- or 2-



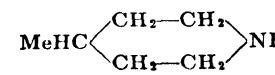
A colorless liquid, d 0 844, b 117

β- or 3-



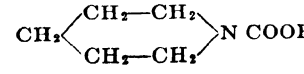
A colorless liquid, d 0 845, b 124

γ- or 4-



A colorless liquid, d 0 867, b 127

pipecolinic acid $C_6H_{11}NO_2$ = 131 2 Piperidine-N-carboxylic acid,



Colorless crystals, m 261, soluble in alcohol

piper (1) Pepper (2) A genus of Piperaceae, q v

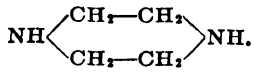
Piperaceae The pepper family, a group of shrubs, or climbing tropical plants, all of which contain aromatic substances

Piper betle	betel leaf
Piper cubeba	cubebs
	cubeb oil
Piper nigrum	black pepper
	white pepper
Piper longum	long pepper
Piper angustifolium	matico
Piper jaborandi	jambu
Piper methysticum	kava
Piper ovatum	piperovatine
Houttuynia californica	yerba mansa

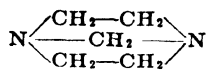
piperamide $C_{12}H_{11}NO_3$ = 217 1 The amide of piperic acid

piperazidine Piperazine

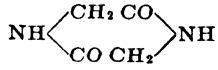
piperazine $C_4H_{10}N_2$ = 86 2 Diethylenediamine, piperazidine, hexahydropyrazine, arthriticine, dispermin(e), ethylenimine



Glassy lustrous leaflets, m 105, b 145, soluble in water, alcohol or ether, used in medicine **dimethyl-** Lupetazin **methenyl-** $C_5H_{10}N_2$ = 98 2

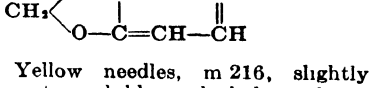


methyl- $C_5H_{12}N_2$ = 100 2 $C_4H_9N_2CH_3$ **p dione** $C_4H_6N_2O_2$ = 114 06 Diketopiperazine, glycine anhydride,



The anhydride of the dipeptide glycylglycine, which occurs in fibroin of silk **p quinate** Sidonal White crystals, soluble in water, used medicinally for gout and neurasthenia

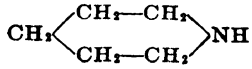
piperic acid $C_{12}H_{10}O_4$ = 218 14 Piperinic acid, *δ*-(*3 4*-methylenedioxyphenyl)-*2 4*-pentadienoic acid*, piperonylidene crotonic acid, *β*-(*3 4*-methylenedioxystyryl)acrylic acid An unsaturated monobasic acid, derived from piperonal



Yellow needles, m 216, slightly soluble in water, soluble in alcohol or ether

piperidic acid $C_4H_9O_2N$ = 103 1 γ-aminobutyric acid, $NH_2(CH_2)_3COOH$ Colorless crystals, m 183, soluble in water or alcohol **homo-** $C_5H_{11}O_2N$ = 117 1 *δ*-aminovaleric acid, $NH_2(CH_2)_4COOH$ Colorless crystals, m 158, soluble in alcohol or water

piperidine $C_5H_{11}N$ = 85 1 Hexahydropyridine Pentamethylene imine A saturated heterocyclic hydrocarbon,

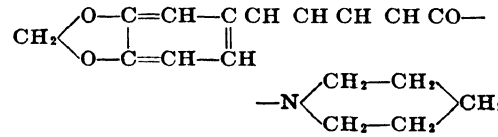


A colorless liquid, d 0 862, m −17, b 106, soluble in alcohol, water, or ether It is a vasodilator and a part of the structure of many alkaloids **dimethyl-** Lupetidine **ethylmethyl-** Copellidine **methyl-** Pipecoline **piperyl-** Piperine **propyl-** Conine **tetramethyl-N-methylbenzoxy-** Eucaine **vinyl-** Meroquinene **p carboxylic acid** Nipecotic acid **p dione** Glutarimide

piperidinium The radical $C_5H_{10}NH_2$— derived from piperidine, with pentavalent N, as, $C_5H_{10}NH\,HCl$ **p compounds** Derivatives of p , as, $C_5H_{10}NH(CH_3)I$

piperidyl The monovalent radical, $C_5H_{10}N$—, derived from piperidine **p urethane** $C_8H_{15}O_2N$ = 157 2 $C_5H_{10}N\,CO\,OC_2H_5$ A colorless liquid, b 211

piperine $C_{17}H_{19}O_3N$ = 285 3 Piperyl-piperidine,



An alkaloid from black pepper Colorless, monoclinic crystals, m 129, slightly soluble in water, soluble in alcohol or ether Used medicinally as an antipyretic

piperinic acid See *piperic acid*

piperitone $C_{10}H_{16}O$ = 152 1 A ketone from eucalyptus oil

piperolidine $C_5H_{15}N$ = 125 13 Octahydropyrrocoline, *δ*-conicine A colorless liquid, d 0 904, *dl-* b 161 *l-* b 158

piperonal $C_8H_6O_3$ = 150 1 Heliotropin, 3 4-methylenedioxybenzaldehyde, piperonyl aldehyde An aldehyde obtained from piperine, having an intense heliotrope-like odor $CH_2{-}O_2\,C_6H_3\,CHO$ Colorless needles, m 37, b 263, slightly soluble in water, soluble in alcohol or ether

piperonilidene The bivalent radical $(CH_2O_2){-}C_6H_3\,CH{=}$, from piperonal Cf *piperic acid*

piperonyl The monovalent radical, $(CH_2O_2)C_6H_3\,CH_2$—, derived from piperine **homo-** See *homopiperonyl* **p alcohol** $C_8H_8O_3$ = 152 10 *3 4*-methylenedioxybenzyl alcohol A solid, m 51, slightly soluble in water, soluble in alcohol or ether **p aldehyde** Piperonal

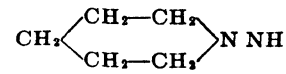
piperonylic acid $C_8H_6O_4$ = 166 1 Methylene protocatechuic acid, methylene dioxybenzoic acid, heliotropic acid A monobasic acid from paracoto bark, m 228

piperovatine $C_{16}H_{21}O_2N$ = 259 3 An alkaloid from the fruits of *Piper ovatum*, a Piperaceae of Trinidad Colorless crystals, insoluble in water, soluble in alcohol, used medicinally

piperyl The monovalent radical, $CH_2\,O_2{-}C_6H_3\,CH\,CH\,CH\,CH\,CO$—, derived from piperic acid

piperylene C_5H_8 = 68 1 Pentadiene*, Δ1 3-amenylene The unsaturated hydrocarbon, $CH_2\,CH\,CH\,CH\,CH_3$, derived from piperidine A liquid, b 40

piperylhydrazine $C_5H_{12}N_2$ = 100 2 Piperidylamine



A colorless liquid, b 146, soluble in alcohol

pipestone Catlinite

pipet A graduated open glass tube used for measuring or transferring definite quantities of liquids See *automatic, Babcock, capillary, counting, Dudley, gas, Mischer, Mohr p* **auswaschen-** A micro-p which *contains* a specified volume of liquid, as distinct from *delivering* it

In order to obtain the whole of the contents therefore, the pipette must be washed out with water after it has drained

pipette Pipet

pipi root The dried root of *Petiveria alliacea*, a Phytolaccaceae Used medicinally as a stimulant, expectorant, and diaphoretic

pipitzahoac The dried roots of *Perezia* species, a Mexican Compositae

pipitzahoic acid $C_{15}H_{20}O_3$ = 248 2 Perezon Golden yellow needles from pipitzahoac, m 103, soluble in water, alcohol, (see *perezol*), or ether

pipitzahoin A colored principle from the roots of *Perezia adnate*, a Compositae, used as an indicator

pipsissewa Chimaphila

piquia fat A fat from the kernels of *Caryocar villosum*, a Caryocaraceae of Brazil (souari or butter nut), it resembles palm oil

pisang Malay for banana **p wax** A wax from the leaves of the Java banana tree, *Musa paradisiaca*, a Musaceae, containing pisangceryl alcohol and pisangcerylic acid

pisangceric acid Pisangcerylic acid

pisangceryl alcohol $C_{13}H_{28}O$ = 200 2 A saturated alcohol, m 78

pisangcerylic acid $C_{24}H_{48}O_2$ = 368 37 A monobasic acid, m 71, from pisang wax

pisanite A native iron-copper sulfate, (Fe, Cu)SO_4 $7H_2O$

piscidia Jamaica dogwood The dried bark of *P erythrina*, used in the West Indies as a fish poison, and medicinally as a narcotic analgesic

piscidic acid $C_{11}H_{10}O_7$ = 254 2 A dibasic acid obtained from piscidia Colorless needles, m 183, soluble in water, insoluble in alcohol, chloroform or benzene

piscidin $C_{29}H_{24}O_8$ = 500 3 A neutral principle from piscidia (dogwood), used as an anodyne

piscose Allulose

pisolite A hard compact form of aragonite

pistacite Epidote

pistil A modified leaf or leaves forming the central part of a flower

pistomesite $MgCO_3$ $FeCO_3$ A native carbonate

pitayamine An alkaloid from the bark of *Cinchona pitayensis*, a Rubiaceae

pitch (1) A heavy liquid or dark residue obtained by distillation of tar, as, pine pitch, Burgundy pitch, coal tar pitch It forms a lustrous brittle mass when cold, and a semi-solid to syrupy mass according to the degree of heat to which it is subjected It consists of many organic compounds which differ according to its origin See *rosin* (2) (verb) To add yeast, with or without sugar, in order to start fermentation **black-** Naval p **Burgundy-** An aromatic oily resin, obtained by distillation of Norway spruce, *Picea excelsa* **Canada-** The resin from *Tsuga* species **earth-** Asphalt **Jews-** Asphalt **mineral-** (1) Asphalt (2) Bitumen **naval-** The dark solid residue from the distillation of various tars **petroleum-** Asphalt **Trinidad-** Asphalt

p blende An impure uranite (q v), in which radium was discovered Cf *bröggerite* **p coal** Specular coal **p stone** A dark-colored igneous rock, similar to obsidian

pithecolobine An alkaloid from the bark of *Pithecolobium saman*, a leguminous tree of the East Indies A brown oily liquid, insoluble in water

pitocin Hypophamine

Pitot tube A vertical U-tube with a moveable scale, closed at one end and containing a liquid which is used to record differences in pressure, it is often used as an anemometer

pitressin β-Hypophamine

Pitrowsky test Biuret reaction

pittacol Eupittonic acid

pitticite Scorodite

pituitary Hypophysis sicca The dried cleaned, and powdered posterior lobe of the pituitary gland of the ox A light, yellowish-gray powder, used in medicine **p liquid** A standardized solution of the active principle of the anterior or the posterior lobe of the pituitary gland (hypophysis cerebri) of the ox See *hypophamine*

pituitrin An extract of the pituitary, containing pitocin and pitressin, used as a vasoconstrictor Cf *hypophamine*

piturі The powdered leaves and twigs of the piturі plant, *Duboisia hopwoodii*, a Solanaceae of Australia Used by the natives of Central Australia as a narcotic stimulant

piturine $C_{10}H_{16}N_2$ = 164 2 An alkaloid from piturі An oily brown liquid resembling nicotine

piuri Indian yellow

pivalaldehyde $C_5H_{10}O$ = 86 08 Trimethylacetaldehyde, *2 2*-dimethylpropanal*, CMe_3-CHO A colorless liquid, d 0 793, m 3, b 75, used in organic synthesis

pivalic acid $C_5H_{10}O_2$ = 102 1 Trimethylacetic acid, *2 2*-dimethylpropanoic acid*, CMe_3COOH Colorless crystals, d $_{50}$0 90, m 35, b 164, soluble in water, alcohol or ether Cf *valeric acid*

pivalyl The monovalent radical, CMe_3CO— **p chloride** CMe_3COCl, trimethylacetylchloride

pix The Latin name for pitch, as, pix burgundica (Burgundy pitch), pix canadensis (Canada pitch) **p liquida** Wood tar

pk (1) An abbreviation for peck (2) The symbol for the logarithm of the reciprocal of the dissociation constant of an electrolyte (cf pH) pk = log 1/k

place isomerism The phenomenon exhibited by chemical substances of similar compositions, which differ in structure by the positions of radicals, as, ortho-, meta-, and para-positions of a compound

placentin An extract from the placenta, used in Abderhalden's test

placer Any alluvial or glacial deposit of sand or gravel containing gold nuggets **p deposit** A gravel or sand containing gold or other precious minerals and metals **p mining** The extraction of gold or other precious metals from gravel and sand by washing

plagioclase A general name for triclinic feldspars Cf *gabbro*

plagionite The mineral $5PbS,4Sb_2S_3$ Cf *lead minerals*

Planck, Max 1858– A German physicist, noted for his development of the quantum theory **P constant** The universal constant, h = 6 547 ± *0 008* × 10^{-27} erg-seconds, (see *quantum theory*) It connects the wave and corpuscle theory of radiations by the equations $E = h\nu$ and $P = h\sigma$ where E is energy P

is momentum, ν the frequency and σ the wave number

Derived from	
Rydberg's constant	6 547 ± *0 011*
Ionization potential	6 560 ± *0 015*
X-rays	6 550 ± *0 009*
Photoelectric effect	6 543 ± *0 010*
Wien's law	6 548 ± *0 015*
Stefan-Boltzmann law	6 539 ± *0 010*

P 's element of action Planck's constant **P 's formula** The energy radiated from a black body is,

$$E_\lambda = C_1 \lambda^{-5}[e^{c_2/\lambda T}-1],$$

where E_λ is the intensity of energy (emissive power) at the wavelength λ expressed (in microns), e, the base of Naperian logarithms, C_1, a constant (9 226 × 10^3 when E is expressed in gram calories/sec /cm ,^{2} and 3 86 × 10^4 when E is expressed in watts/cm ^{2}), and c_2, a constant equal to 14,350, T the absolute temperature **P 's unit** Planck's constant

plane Any surface, imaginary or real, which is flat or level with itself in all directions **p of symmetry** An imaginary plane passing through a crystal so that, for each face or angle of the crystal, there is a similar face or angle on the opposite side of the plane, a line joining the two faces being perpendicular to the plane **p symmetric-** The cis- or maleinoid form of a geometric isomerism **p symmetric isomerism** Geometrical *isomerism*

planet A celestial body moving around the sun in a nearly circular orbit Cf *meteoric*

planetary Pertaining to a planet **p atmosphere** The gases surrounding a planet They are chiefly

Mercury	none
Venus	CO_2
Earth	N_2
Mars	H_2O
Jupiter	H
Saturn	NH_3 CH_4 H
Uranus	H CH_4
Neptune	H_2 CH_4
Pluto	?

plant (1) The machinery and implements used in manufacturing processes (*2*) A living organism of the vegetable kingdom, which generally contains chlorophyll and photosynthesizes food, hence (unless a parasite or saprophyte) it requires only inorganic substances Cf *animal* P are grouped into four phyla or branches Each plant generally consists of two systems

A Protective system
1 of the surface epidermis, cork, bark
2 of the skeleton bast fibres, collenchyma, sclerotic parenchyma

B Nutritive system
1 absorbing tissues epithelium of roots, root hairs, etc
2 assimilating tissue chlorophyll parenchyma
3 conducting tissue conducting parenchyma, vascular bundles, latex cells
4 storage tissue reserve tissue of seeds, bulbs, tubers, and water tissues
5 aerating system intercellular spaces, stomata, and lenticels
6 receptacles for secretions and excretions glands, oil, resin and mucus canals, crystal sacs

p acids The organic acids in vegetable organisms, as, citric acid (lemons) tartaric acid (grapes), cinnamic acid (cinnamon) tannic acid (barks) **p elements** The elements known to be essential to plant growth C, H, O, N, S, P, K, Ca, and Mg In addition traces of Fe, Na, Si, Al, Cl Mn, Zn B, and F may be essential **p food** Any artificial fertilizer containing the carbonates, nitrates, phosphates or sulfates of potassium, calcium magnesium, or iron **p pigments** The coloring matter of plants, chiefly

1 chlorophyll pigments, the green and reddish colors of leaves Cf *porphin ring*
2 carotenoids (q v), the lipochromes or fatty pigments of plants
3 flavones and flavanols (q v), the fairly soluble pigments of blossoms and fruits

plantain (1) The dried leaves of *Plansago major*, a Plantagineae, used as the fluid extract as a diuretic (*2*) The herbaceous tree *Musa sapientum paradisiaca*, a Scitaminaceae, its fruit is the Adams apple Cf *banana*

plantose An albuminous substance from rape seeds

plaskon Trade name for a urea- or melamine-formaldehyde plastic

plasma (1) The liquid part of the blood, containing fibrinogen, used in the preparation of antitoxins (2) A green mottled variety of chalcedony **proto-** Protoplasm

plasmochin $C_{19}H_{28}N_2O$ = 300 2 Aminoquin pamaquin, plasmoquine, *8*-dimethylaminoisoamyl-*6*-methoxyquinoline Yellow powder, insoluble in water, soluble in alcohol, used as an antimalarial

plasmolysis The dissolution of the protoplasm of a cell by bathing it in water or salt solutions See *hypertonic, isotonic, hypotonic*

plasmoquine Plasmochin

plaster A paste for coating the surface of a body or substance a material for making molds **ahdesive-** A mixture of rosin and wax, used for coating paper or textiles **hard burnt-** An insoluble form of anhydrite **lead-** See *lead* **p of paris** $2CaSO_4 H_2O$ The hemihydrated calcium sulfate, made by heating gypsum It quickly solidifies in the presence of water and is used to make molds for taking impressions of objects

plastic Soft or moldable, pliable Cf *plastics*

plasticity The property of being soft and tenacious, and able to be formed or shaped in any desired way

plasticizer A compound which keeps a substance soft and viscous and prevents the cracking of films For lacquers the p are the phthalates (q v) and tricresyl phosphate Cf *lacquer solvents*

plastics A group of synthetic or natural materials which can be shaped when soft and hardened afterwards **casein-** P materials made from milk, as, galalith **cellulose-** P materials made from nitrocellulose and camphor, as, celluloid **phenol-** P made by gradual condensation of phenol and formaldehyde, as, bakelite **rosin-** Phenol- **thermoplastic-** A p which becomes soft and moldable when heated, as, cellulose, vinyl polymers and styrol resins **thermosetting-** A p which hardens when heated, as, vulcanite (rubber), phenol-aldehyde (bake

lite) and glycerol-phthalic anhydride (glyptal) resins

SYNTHETIC PLASTICS

1 *Phenol-aldehyde Resinoids and Resins* Heat-hardening resins, or resinoids, used as heat-hardening plastics and heat-hardening coatings Also oil-soluble resins and resin mixtures, used with drying oils in making varnishes, enamels paints and nitrocellulose lacquers
Albertol, Amberol, Bakelite, Beckacite Carboloid, Catalin, Celoron, Colasta, Coltrock, Condensite, Crystillin, Damarda Dekorit, Dilecto, Duranoid, Dures, Durite, Durium, Endolac, Fibroc, Formalite, Formica, Formite, Haveg, Indur, Indurite, Juvelith, Karbolite, Leukorit, Makalot, Marblette, Micarta, Monolite, Mouldensite, Panelyte, Paranol, Phenolic, Phenolite, Mouldrite, Neolith, Neoresit, Nestorite, Redmanol, Resinit, Resinox, Spauldite, Synthane, Texolite, Vigorit

2 *Polyalcohol-phthalic anhydride Esters (Resinoids, Resins, and Resin Mixtures)* Used in hardened forms, principally for electric insulation, but also as cements
Glyptal, Rezyl Teglac

3 *Urea-formaldehyde Resinoids Thio urea-formaldehyde Resinoids or Mixtures of these* Employed in heat-hardening molding materials
Aldur, Bandalasta Beatl Beetle Beetleware, Crystalite, Melamac, Plaskon, Plass, Prystal, Pollopas, Untye

4 *Coumarone-indene Polymers*
Brofo

5 *Vinyl Polymers* Used for dentures, phonograph records, synthetic rubber
Monilith, Resovin, Vydon, Vinylite, Chloroprene, Duprene, Vinyon

6 *Sulfonamid-aldehyde Resins*
Santolite

7 *Cyclohexanone-formaldehyde Resins*
No trade name

8 *Aniline-formaldehyde Resin*
Ciba Head-hardening plastic

9 *Styrol Resins*
Victron, Waterlite Hot molding material

10 *Terpene Polymers*
Rezinel

11 *Sugar Resin*
Sakaloid

12 *Cellulose derivatives*
Celluloids

13 *Casein Materials*
Galaliths, etc used for billard balls and artificial ivory

14 *Superpolyamides*
Nylon

15 *Acrylate Polymers*, for glass substitutes
Lucite Perspex

plastometer A device for measuring the plasticity of a material by timing its flow through successive increments of length of a capillary tube

plate A thin sheet of metal, glass, etc with a flat surface, *e g*, silver-, tin- or plate glass **black-** Plate used for tinning, in the untinned state **photographic-** A glass sheet covered with an emulsion containing light-sensitive silver salts Cf *chromatic* p **p amalgamation** A method of extracting gold from finely-crushed ore by floating it over a copper surface coated with mercury

platina A native form of platinum, which often contains Ir, Rh, Ru, Os, Au and Ag

platinammines Compounds of tetravalent platinum, which contain four molecules of ammonia

platinammonium The tetravalent radical $Pt(NH_3)_2$≡ **p chloride** $Pt(NH_3)_2Cl_4$

plating (1) A process or method by which a surface is coated with a metal, as, *silver*-plating, *nickel*-plating (2) Infecting a culture-media with a bacterial suspension **close-** A non-electrolytic process in which sheets of metal are soldered on to the surface to be plated **electro-** The coating of a surface with a metal by electro-deposition

platinibromide Bromo-platinate A salt containing the $PtBr_6$= radical

platinic A substance containing quadrivalent platinum, as, platinic chloride, $PtCl_4$ **p. acid** H_2PtO_3 = 245 2 A white powder, soluble in alkalis (forming platinates) and acids (forming platinic compounds) *chloro-* $H_2PtCl_6 6H_2O$ = 518 1 A reddish-brown crystalline mass, soluble in water Used as a reagent for separation of potassium from sodium, technically, for platinization, in photography, for toning, in ceramics, for metallic lusters, and in the manufacture of platinized asbestos catalysts (q v) **p bromide** $PtBr_4$ = 514 9 Platinum tetrabromide A dark brown crystalline mass, soluble in water or alcohol **p chloride** (1) Chloro-*platinic acid* (2) $PtCl_4$ = 336 6 A reddish-brown crystalline mass soluble in water, alcohol or ether **p hydroxide** $Pt(OH)_4$ = 263 2 A red-brown powder, decomp by heat, insoluble in water, soluble in acids or alkalis **p iodide** PtI_4 = 702 9 Platinum tetraiodide An amorphous, brownish-black powder, insoluble in water, soluble in iodide solutions, acids, or alkalis **p oxide** PtO_2 = 227 2 Platinum dioxide A black powder, m 430, decomp by further heat, insoluble in water, soluble in acids **p sodium chloride** Sodium platinichloride **p sulfate** $Pt(SO_4)_2$ = 387 2 Platinum sulfate A greenish-black, deliquescent, crystalline mass, soluble in water, used as a reagent in microchemical analysis **p sulfide** PtS_2 = 259 3 Platinum disulfide Black needles, d 5 27, decomp by heat, insoluble in water, soluble in ammonium sulfide solution

platinichloride Chloroplatinate A salt of chloroplatinic acid containing the divalent $PtCl_6$= radical They are double salts of platinic chloride and another chloride

platiniferous An ore or substance containing platinum

platiniridium A native alloy of platinum and iridium, often containing Rh, Ru and Cu

platinization A process in which a surface is coated with platinum

platinize To coat with metallic platinum **p-d asbestos** Asbestos impregnated with a solution of a platinum salt and ignited, so that the metal is produced, used as a catalyst

platinochloride Chloroplatinite A salt of chloroplatinous acid containing the divalent $PtCl_4$= radical They are double salts of platinous chloride and another chloride

platinocyanide Cyanoplatinite A double salt of platinous cyanide and another cyanide, as

$K_2Pt(CN)_4$ or $BaPt(CN)_4$ Used in photography and for fluorescent x-ray screens

platinoid The alloy Cu (61 %), Zn (24 %), Ni (14 %) and W (1–2 %), used for electrical resistance coils

platinous Describing a compound containing divalent platinum, Pt= **p bromide** $PtBr_2$ = 355 0 Platinum dibromide A brown crystalline deliquescent mass, decomp 200, insoluble in water **p chloride** $PtCl_2$ = 266 1 Platinum dichloride A brown crystalline mass, d 5 87, insoluble in water, soluble in hydrochloric acid or chloride solutions **p cyanide** $Pt(CN)_2$ = 247 22 Platinum dicyanide A yellow powder, insoluble in water, soluble in cyanide solutions **p hydroxide** $Pt(OH)_2$ = 229 2 A black powder decomp by heat, insoluble in water, soluble in acids or alkalis **p iodide** PtI_2 = 449 0 Platinum diodide A black powder, decomp 325, insoluble in water, soluble in acids **p oxide** PtO = 211 1 Platinum monoxide A violet to black powder, decomp by heat, insoluble in water, soluble in acids **p sodium chloride** Sodium platinochloride **p sulfide** PtS = 227 3 Platinum monosulfide A black powder, d 8 89, decomp by heat, insoluble in water, soluble in ammonium sulfide solution

platinum Pt = 195 23 A noble metal of the fourth period, atomic number 78, discovered or described in 1741 by Wood It is a silver-gray metal, d 21 37, m 1755, b 4530, insoluble in water, alcohol, acids or bases, soluble in aqua regia Used in chemistry as a catalyst, as a material for acid-proof containers (crucibles, dishes, foils), wires (for flame tests), and electrodes, and for jewelry World production (1941) 450,000 oz troy, U S S R 170,000, Canada 149,000, S Africa 40,000, U S A 38,000 It is shaped as foil, wire, powder (platinum black) or gray spongy mass (platinum sponge), and forms two series of compounds platinous (valency 2) and platinic (valency 4) Each series forms many double salts **p alloy** An alloy of platinum with some other noble metal, as, gold, iridium or rhodium **p black** A black powder, consisting of finely-divided platinum, used in organic synthesis as a catalyst **p chloride** (1) Commercial chloroplatinic acid (see *platinic acid*) (2) Platinic chloride (3) Platinous chloride **p dibromide** Platinous bromide **p dichloride** Platinous chloride **p dicyanide** Platinous cyanide **p diiodide** Platinous iodide **p dioxide** Platinic oxide **p disulfide** Platinic sulfide **p iridium** An alloy of 90 % platinum and 10 % iridium **p metals** A group of noble metals which occur together in nature (see table), and form two groups of the periodic system They are all catalysts in many oxidizing and reducing reactions **p monosulfide** Platinous sulfide **p monoxide** Platinous oxide **p minerals** Platinum occurs in nature always associated with the other metals of the group, and generally in the uncombined state

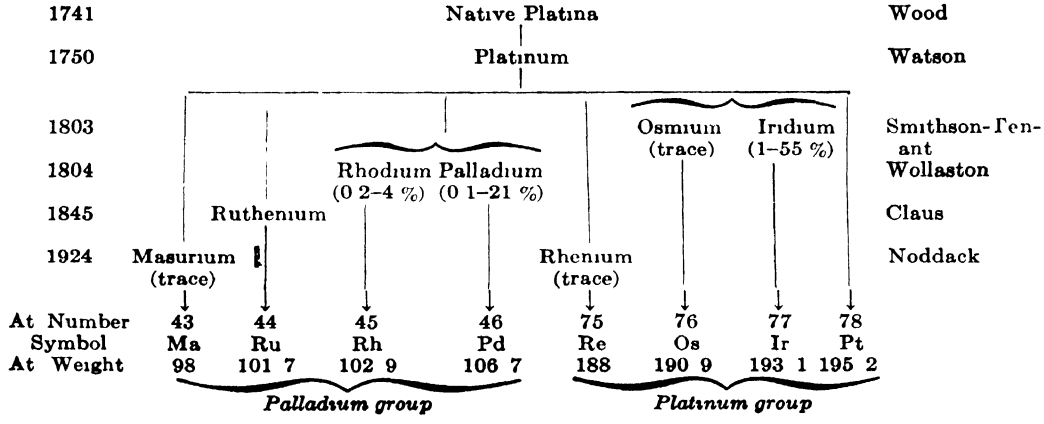
native platinum	Pt
platiniridium	(Pt,Ir)
platinum arsenide	$PtAs_2$

See also *cooperite, platina* **p sponge** Metallic platinum in the form of a gray, spongy, porous mass, obtained by reduction of chloroplatinic acid Used as a catalyst in organic reactions **p sulfide** Platinic sulfate **p tetrachloride** Platinic chloride **p yellow** A barium chloroplatinate or other alkaline chloroplatinate, used as a coating for fluorescent screens in x-ray work

platinum-cladding The bonding of a layer of platinum to a thicker bar of some other metal, and working the two down to a desired thickness, used for laboratory ware

platize Platinize

THE PLATINUM METALS



Plato unit A measure of the specific gravity of wort, the number of grams of wort-solids per 100 grams of wort

platosammine A compound of divalent platinum, which contains two molecules of ammonia, $Pt(NH_3)_2X_2$ or $PtX_2\ 2NH_3$

Plattner, Karl Friedrich 1800–1858 A German mineralogist noted for analytical blowpipe methods **P 's anvil** A small anvil used in blowpipe analysis **P 's process** A method of extracting gold as gold trichloride by passing chlorine gas through the gold-bearing pulp

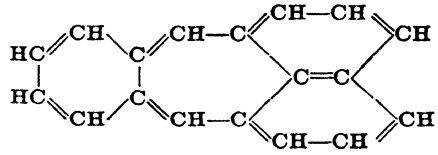
plattnerite A native lead oxide, PbO_2

Pläusen mill A colloid mill

plazolite $3CaO\ Al_2O_3\ 2(SiO_2\ CO_2)\ 2H_2O$ A Californian calcium aluminum silicate, colorless crystals

pleiad A group of isotopes

pleiadene $C_{18}H_{12}$ = 228 1 A tetracyclic hydrocarbon with a hepta-atomic ring



Derivatives of this compound are formed by the condensation of phthalic acid with *β*-naphthol

pleiapyrin A condensation-product of benzamide and antipyrine A white powder, m 75, soluble in water, used as an antipyretic

pleio- See *pleo*

pleochroic Pleochromatic

pleochroism Pleochromatism

pleochromatic Pleochroic The capacity of a substance to show more than one color, as, a fluorescent solution

pleochromatism Pleochroism The capacity of certain optically-biaxial crystals to transmit polarized light, so that a complementary color is seen at right angles to the direction of the ray This is due to absorption of the light to different extents along the several axes of the crystal (Cf *dichroism*—a particular case dealing with only two colors)

pleomorphic Occurring in more than one form

pleomorphism The capacity of certain crystals to crystallize in two or more different crystal systems

pleonast The mineral $(Mg\ Fe)O,(Al\ Fe)_2O_3$

plessite Gersdorffite

Plessy's green Chromic phosphate

pleurisy foot Asclepias

plevacol A compound of aminobenzoyl-eugenol-tricresol and formalin Yellow crystals, m 155, soluble in acetone, benzene or alcohol, used in dentistry for filling root canals

plexiglas Trade name for a methyl acrylate plastic

pliers Pincers with long jaws for holding, bending or cutting **button-** A circular disk with a round hole, used to hold assay buttons during polishing

Pliny the Elder Cajus Secundus Plinius, 23–79 A Roman soldier noted for his scientific observations (Vesuvius eruption) and writings (*Historia naturalis*)

pliofilm A transparent film made from chlorinated rubber

plodding A term used in soap manufacture for the compression of the warm soap into shape in a screw compressor

Plotnikow effect The longitudinal scattering of (especially infra-red) rays by solid objects or fluids Cf *Raman effect*

plotting To make a graph or chart representing a relationship between two unknowns, by determining a number of pairs of values which satisfy the relation, and representing them in terms of the lengths of two lines at right angles (the coordinates), each of which represents and is graduated to correspond with one unknown

Plucker tube An evacuated glass tube with two electrodes containing a gas under reduced pressure Used in spectroscopy

plumbagin(e) $C_{11}H_8O_3$ = 188 1 Methyljuglone, *5*-hydroxy-*2*-methyl-*1 4*-naphthoquinone Yellow crystals, m 78–79, from the root of *Plumbago europea*, *P zeylonica* and *P rosea*, a Plumbaginaceae

plumbago Native graphite Blacklead Used in the manufacture of "lead" pencils, crucibles, and other utensils, and as a lubricant See *-dag*

plumbane (1) An organic compound of lead of the type, PbR_4, as,

tetramethyl-	$PbMe_4$
tetraethyl-	$PbEt_4$
tetraphenyl-	$PbPh_4$

(2) $Pb(C_2H_5)_4$ = 323 2 Tetraethyl lead*, lead tetraethide A colorless liquid used as an antiknock compound in gasoline Cf *ethyl gasoline*, *stannanes*

plumbates A series of salts derived from lead hydroxide, $Pb(OH)_4 \rightleftarrows H_4PbO_4$, of the types M_2PbO_3, meta-plumbates, M_4PbO_4, ortho-plumbates

plumbic Describing a compound of tetravalent lead **p ocher** Brown *lead oxide*

plumbiferous An ore or material containing lead

plumbism Poisoning by lead

plumbite A salt derived from lead hydroxide, $Pb(OH)_2$, of the types, $MHPbO_2$ or M_2PbO_2

plumbocalcite Lead containing calcite

plumbogummite A native aluminum and lead phosphate

plumbo-solvency The degree of solubility of lead in a liquid

plumbous Describing a compound of divalent lead **p compounds** See *lead*

plumbum The Latin name for lead. **p candidum** A former name for tin **p. cinereum** A former name for bismuth **p nigrum** A former name for lead

plumiera Sucuuba bark The dried bark of *Plumiera sucuuba*, an Apocynaceae, used medicinally as anthelminthic.

plumieric acid $C_{20}H_{24}O_{12}$ = 456.2 A crystalline principle from plumiera

plumierin $C_{21}H_{28}O_{12}\ H_2O$ = 488 3 Agoniadin, asonidin A glucoside from the bark of *Plumiera* species A white crystalline powder, m 155 (decomp), soluble in water

plumierine $C_{37}H_{72}N_{32}$ = 1218 9 An alkaloid from *Plumiera acutifolia*, an Apocynaceae Colorless crystals, insoluble in water, used medicinally for gonorrhea

plumose Having a fleecy or feathery appearance **p growth** A fleecy, feathery growth of bacteria on the culture medium **p mica** A variety of muscovite resembling asbestos

plural gel A gel formed by the simultaneous gelification of a mixture of two or more sols

pluranium An alleged new element discovered by Osann in 1828 in a platinum ore, and probably a mixture of TiO_2, SiO_2 and ZrO_2

plutonic Igneous A general name for rocks that have crystallized below the earth's surface, as, granite

plutonium Barium

pluviometer Rain gauge An instrument for measuring rainfall

pneumatic (1) Pertaining to air (2) Pertaining to gases Cf *aerodynamics* **p drill** A drill operated by compressed air **p jig** A device for separating minerals by an air blast **p trough** A container of water in which an inverted cylinder, filled with water, is placed for the collection of gases

pneumatics A branch of physics dealing with the mechanical properties of gases

pneumatology (1) The science of respiration (2) The science of gases

pneumatolysis The process by which many ore deposits were produced as a result of the liberation of gases or vapors during solidification of igneous rocks

pneumin Methylene creosote A yellow, odorless, powder, insoluble in water, soluble in alcohol or ether, used medicinally

pneumonokoniosis A form of pneumonia produced by the inhalation of certain industrial dusts, especially coal

pockeling The development and expansion of circular patches on fresh surfaces of certain solutions, *e g* , of soap

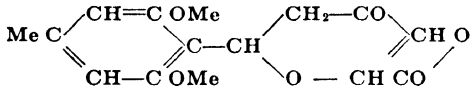
pocket (1) A sac-shaped cavity or hole (2) A small body of ore (3) An enlargement of an ore-vein (4) A unit of measure for certain commodities (as hops)

poco oil The essential oil from *Mentha aquatica*, which is rich in linalool acetate

podophyllic acid $C_{15}H_{16}O_7 = 308\ 13$ A monobasic acid derived from podophyllin by hydrolysis

podophyllin A resin obtained from podophyllum which contains podophyllic acid, podophyllotoxin, and picropodophyllin A yellow powder, insoluble in water, slightly soluble in ammonia or alcohol, used medicinally as a purgative **picro-** $C_{12}H_{14}O_6$ An isomer of podophyllotoxin, an internal or monomolecular anhydride of podophyllic acid

podophyllotoxin $C_{15}H_{16}O_6 = 290\ 1$ The active principle of podophyllin



A yellow powder, insoluble in water soluble in alcohol, used medicinally

podophyllum Mandrake, May apple The dried rhizome of *Podophyllum peltatum*, a Berberidaceae, which contains 3 % podophyllin Used medicinally as the fluid extract

podzolisation The division of soil into 3 layers by continual leaching with rain-water The top layer contains decaying organic matter, the centre layer the material out of which silica, iron oxide and alumina have been washed, and the bottom layer re-deposited extractives

Poggendorff, Johann Christian 1796–1877 A German physicist who founded scientific periodicals, and was noted for magnetic and electrical research **P cell** An electrical element, which consists of an amalgamated zinc anode and carbon cathode in a solution of 12 pts potassium dichromate, 25 pts sulfuric acid, and 100 pts water, E M F 2 01 volts **P compensation method** The determination of the potential of a cell by comparing the potential required to balance it with that required to balance a standard, in terms of the length of a resistance wire, analogously to the Wheatstone bridge, q v

Pohl's commutator An electrical contact key that enables the direction of current to be reversed instantaneously, used in physiological experimental work

poi See *taro*

poikilothermism The ability of living organisms, especially lower forms of life, to adapt themselves to various temperatures

poidometer A rapid-action industrial weighing machine

point (1) That which has position but not magnitude (2) A minute spot (3) A numerical value on a scale **boiling-** The minimum degree of temperature at which a liquid changes rapidly to the vapor state **condensation-** The maximum degree of temperature at which a vapor changes to the liquid state **critical-** The degree of temperature above which a gas cannot be liquefied by pressure only **dew-** The degree of temperature at which the moisture of the air condenses **end-** In titration the stage at which a single drop of solution completes the reaction **freezing-** The maximum degree of temperature at which a liquid changes to the solid state **isoelectric-** See *isoelectric point* **melting-** The minimum degree of temperature at which a solid becomes liquid **liquefaction-** (1) Melting point (2) Condensation point (3) Critical point **quadruple-** The degree of temperature at which all four phases in a two-component system can exist **refraction-** The spot on a surface at which a ray of light is refracted **triple-** See *triple point*

poise (1) The C G S unit of viscosity, q v It equals 1 dyne per sec per sq cm , or, 1 45 × 10^{-6} lb -sec per sq ft Cf *Poiseuille's Law* (2) To balance or maintain an oxidation-reduction equilibrium, as, a poising agent

poiser A poising agent, q v

Poiseuille's Law See *viscosity*

poising agent Poiser A substance which stabilizes an oxidation-reduction equilibrium, analogous to a buffer maintaining an acid-base equilibrium

poison (1) A substance that causes the disturbance, disease, or death of a living organism Classifications

A CHEMICAL (according to composition)
- 1 Inorganic poisons
  - a mineral alkalis
  - b mineral acids
  - c metallic poisons
  - d volatile non-metallic poisons (see table)
- 2 Organic poisons
  - a organic acids
  - b glucosides
  - c alkaloids
  - d volatile organic poisons (see table)
  - e bacterial poisons
  - f animal poisons

B PHYSIOLOGICAL (according to effect)
- 1 Irritants
  - a true irritants
  - b corrosives
- 2 Neurotics
  - (cerebro-)
  - a narcotics
  - (spinal-)
  - b tetanics
  - (cerebro-spinal-)
  - c depressants
  - d deliriants
  - e asthenics

(2) A substance which, added to a metal or alloy, injures its quality (3) A substance which destroys or diminishes the action of a catalyst or an enzyme **acrid-** Irritant **arrow-** A poisonous substance used by savages on their arrows **bacterial-** P produced by bacteria, as, toxins, ptomaines, food poison, q v **corrosive-** A substance that causes a local destruction of tissue, as, acids, alkalis

silver nitrate **cumulative-** A poisonous substance that is retained in the body and gradually accumulates **fish-** A substance used by natives to stupefy fish **narcotic-** A substance that produces a stupor or delirium **true-** A poisonous substance that is absorbed and causes disease or death See *arrow-*

p ash Chionanthus **p effect** See *M-W E* and table **p gas** See *p vapor gas* **p ivy** *Rhus toxicodendron* **p nut** Nux vomica **p oak** (1) The fresh leaflets of *Rhus toxicodendron* an Anacardiaceae of the Atlantic States Cf *poison ivy* Used medicinally as the fluid extract (2) *Rhus diversiloba* of the Pacific Coast Both produce highly-irritating skin inflammations, which may be avoided by alcohol rubs and ferrous sulfate applications immediately after exposure **p vine** Same as *Rhus toxicodendron* **p vapors**

	(1) Fatal Per cent	(2) Tolerated Per cent
acrolein	†0 001	0 00033
ammonia	0 3	0 03
aniline		0 00004
arsine	†0 05	0 001
benzene		0 0005
bromine	†0 1	0 004
carbon disulfide	0 001	0 0001
carbon dioxide	†30 0	2–3
carbon monoxide	†0 5	0 04
carbon tetrachloride	†0 03	0 001
chlorine	†0 10	0 0001
chloroform	†0 03	0 001
chloropicrin	†0 05	0 0001
dichlorodiethyl sulfide		0 002
hydrochloric acid	†0 5	0 005
hydrocyanic acid	†0 048	0 002
hydrogen sulfide	†0 06	0 01
iodine		0 0001
mercury		*0 00012
nitrogen monoxide	†0 07	0 0033
nitrobenzene		0 00002
phosgene	†0 02	0 0001
phosphorus trichloride	†0 00035	0 0000004
phosphine	†0 2	0 01
sulfur dioxide	†0 2	0 01
sulfur trioxide	†0 001	0 0002
toluidine		0 0001

(1) † Percentage in air which is fatal in 30 minutes or less, others dangerous after 30 minutes

(2) Maximum safe concentration in air for humans, the percentage that can be borne for one hour

* Exposure for 2–3 months causes poisoning

poisoning The diseased condition produced by a poison **acute-** A morbid condition caused by a single excessive dose of poison **chronic-** A morbid condition caused by many small doses of poison **garage-** A morbid condition caused by inhalation of carbon monoxide, which accumulates in poorly-ventilated rooms in which a combustion motor is running

poisonous dose The amount that produces marked pathological conditions

Poisson's ratio The ratio of the lateral contraction to the longitudinal extension for a bar under a stress parallel to its own length

poivrette Ground olive stones, used as an adulterant for pepper

poke Phytolacca **Indian-** Veratrum **p berries** The fresh fruits of *Phytolacca decandra* Used medicinally, as the fluid extract, as an emetic and narcotic, also as an indicator **p root** Phytolacca

Polaises reaction See *Grignard reaction*

polar Pertaining to a pole **p bond** The electrostatic union of two atoms established by the passage of one or more electrons from one atom to the other *E g*, in NaCl one electron passes from Na to Cl and, accordingly, the charge of the sodium becomes positive and that of the chlorine negative

(a) $Na \rightarrow Cl$

(b) Na Cl

(c) Na^+ Cl^-

non- The electromagnetic union of two atoms established by sharing in common one or more pairs of electrons, thus, in CO_2 the two double bonds each consists of a pair of electrons

(a) $O \leftarrow C \rightarrow O$

(b) O C O

(c) O⇶C⇶O

p compound An electrolyte, or any compound that can ionize when dissolved or fused In general all inorganic acids, bases, and salts belong to this group, in which the atoms are supposed to be held in electrostatic union **nonpolar-** A non-electrolyte, in general, an organic compound the atoms of which are supposed to be held in electromagnetic union by sharing a common pair of electrons **p formula** See *formula* **p number** See *polar-number* **p zone** See *zone*

polarimeter Polariscope

polarimetry Polariscopy The measurement of the rotation of polarized light by means of the polariscope

polarisation Polarization

polariscope Polarimeter A device for measuring the rotation of polarized light It consists of two Nicol prisms between which is placed a column of polarizing liquid By rotating the Nicol prism nearest to the eye until the intensity of the light passing through the liquid equals the intensity of the comparison field, the new plane of vibration of the light can be read from the scale in degrees See *rotation* (and illustration)

polariscopy Polarimetry

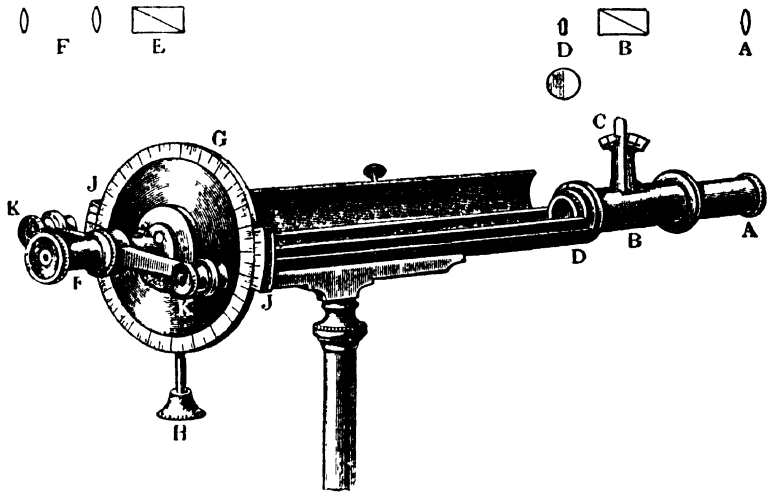
polariser Polarizer

polarising Polarizing

polarity Describing a body having two poles, or different properties at terminal points **atomic-** The loss or gain of one or more electrons by an atom (see *polar bond*) **chemical-** Describing a molecule that has an acid and a basic radical, as, an aminoacid, NH_2—R—COOH **electrical-** The positive and negative terminal, pole, or electrode of an electrical device **magnetic-** The north or south pole of a magnet **molecular-** The distribution of electric charges in a molecule See *polarization* (3)

p formula A formula which indicates the distribution of electric charges within the

molecule Cf *formula, molecular diagram, structure symbols* **p paper** A filter paper impregnated with an indicator and salt that is moistened and used to distinguish the positive and negative poles of a direct electric current *E g*, if on a filter paper saturated with sodium chloride and phenolphthalein solutions two (D C) wires are placed at a little distance apart, electrolysis takes place and the hydroxyl ion will color the phenolphthalein red, hence, the corresponding wire is the positive electrode



Polariscope

A Objective facing a source of monochromatic light
B Nicol prism to polarize the light
C Adjustment for polarizer (B)
D Diaphragm
E Nicol prism to analyze the light
F Eye-piece
G Scale
H Screw to rotate analyzer (E)
J Movable scale
K Magnifier to read scale

polarization (1) The property of certain substances to polarize light passing through them (2) The stoppage or reversal of the voltaic current from an electrolytic cell due to the accumulation of dissociation products at the electrodes (see *overvoltage*) Cf *Clausius-Mosotti equation, p potential* (3) The orientation of a molecule in an electric field (*e g*, the positive nucleus toward the negative pole, the electron cloud toward the positive pole), hence a distortion of the polarity Polarization, α, is related to molecular refractivity, R, by $\alpha = 3R/4N$, where N is Avogadro's number, it is measured by $\alpha = el/I$, where e is the charge, l the distance and I the intensity of the field Cf *molecular refractivity, collinsics* **cell-** The accumulation of hydrogen bubbles on the negative electrode of a battery **circular-** Polarized light consisting of circular vibrations **elliptic-** Polarized light, the vibrations of which are elliptical **plane-** Polarized light, the vibrations of which are all parallel and in one plane

p curve (1) The current-voltage curve obtained when the intensity of an electrolytic current is plotted against the polarizing electromotive force (2) A polarogram q v **p. potential** The reverse potential of an electrolytic cell, tending to oppose the direct potential of a battery which is effecting electrolytic decomposition in the cell It is due to the accumulation of the dissociation products on the electrodes Cf *overvoltage*

polarize To produce polarization

polarized light It is assumed that polarized light consists of unilateral vibrations, swinging parallel to one another either in the same plane, ellipse or circle, whereas non-polarized light vibrates in a number of planes (see *polarizer*) A polarized ray is thus made up of 2 rays, which are complementary in the sense that the vibrations occur in directions at right angles (the ordinary and extraordinary rays) The ordinary ray is "lost" in the polarimeter by total reflection, and the extraordinary ray emerges as light polarized in one plane only Optically-active substances rotate this plane Cf *radiation, Verdet*

polarizer A device for polarizing light, as, a Nicol prism through which only light vibrating in one definite plane passes The polarizer acts a filter by transmitting only parallel vibrations, thus ||||, which on passing through an optically-active substance are rotated either ///// or \\\\ Cf *analyzer*

polarizing Causing polarization **p angle** See *Brewster s law* **p disk** Polaroid A specially-prepared cellulose film containing oriented iodoquinine sulfate crystals, mounted between two glass plates Used as a substitute for nicol prisms, in polariscopes, and for microscopes, reading glasses and windshields to avoid glare

polar-number Valence number The mathematical expression of valence by assigning to each atom in a compound a positive or negative integer, so that their sum is zero Hydrogen is 1, oxygen -2 and free elements are zero Cf *oxidation, reduction, valence*

polarogram Polarization curve The current-voltage curve produced by a beam of light on photographic paper rotating in the polarograph It indicates the quantity and purity of substances electrolytically reduced at specific cathodic potentials

polarograph An instrument which records the movements of a galvanometer by means of the image produced (on a revolving drum of light-sensitive paper) by a beam of light reflected from a mirror attached to the galvanometer needle It records photographically, minute changes in the intensity of a current resulting from a gradually-increasing applied voltage, in electrolysis, with a dropping mercury cathode It is used to measure cathodic electrode processes (*e g*, deposition or reduction of cations and

anions), reduction and hydrogenation of organic compounds, overvoltages, complexity of ions, and ionic equilibria, solubility, simultaneous qualitative and quantitative microanalysis for several constituents It was devised by Hevrovsky q v

polaroid A polarizing disk, q v

pole (1) Rod (2) The opposite points at the ends of an axis, a pair of points that have opposite physical properties **negative-** The cathode, an electric terminal charged with electrons **(magnetic) north-** That point toward which a magnetic needle, freely suspended, will point **positive-** The anode or electric terminal that is positively charged as a result of loss of electrons

Polenské number The number of cc of 0 1 normal alkali (less the blank) to neutralize an alcoholic solution of the water-insoluble volatile fatty acids liberated on acidification of the soap made by saponification of 5 grams of a fat (Cf *Reichert number*)

polianite Pyrolusite

policeman A device for removing precipitates from the walls of glass vessels in quantitative analysis **platinum-** A platinum-iridium alloy **claw** that fits over a glass rod, and is used to hold a quantitative filter during ignition **rubber-** A small piece of rubber tubing fitting snugly over a glass rod It is used to rub the precipitates off the walls of glass vessels

polish A preparation that is used to clean metal surfaces and make them bright and lustrous

polishing The act of rubbing or smoothing metal or glass surfaces **electrolytic-** The smoothing of a metal surface by making it the anode in a suitable electrolyte (usually phosphoric acid and glycerin) The high current-density produced on the small projecting portions results in their preferential dissolution

polishing slate A gray or yellow slate used for polishing

Pollack's cement A mixture of equal weights of red lead and litharge, made into a stiff paste with gelatin It is used for jointing metal and/or glass, and although slow-setting, has great strength

pollantin An antitoxin obtained by inoculating horses with pollen extract, used medicinally for immunization

pollen The male sex-cells or fertilizing grains of a flowering plant, which contain glucosides, *e g*,

ragweed p	quercitin, isorhamnetin
bulrush p (*Typha angustata*)	isorhamnetin
orchard grass p (*Dactylis glomerata*)	dactylin
timothy p (*Phleum pratense*)	dactylin

Cf *stamen, pollantin* **p extract** A solution of proteins obtained from the pollens of various plants that are believed to be the cause of hay fever, used medicinally for immunization **fall-** An aqueous liquid obtained by the extraction of the proteins of ragweed, goldenrod, and maize **spring-** An aqueous liquid obtained by extracting the proteins of rye, timothy, orchard grass, redtop grass, and sweet vernal grass, used for immunizing to hay fever

pollopas A glass-like transparent plastic (q v), used as a substitute for glass

pollucite $Cs_2O\ Al_2O_3\ 5SiO_2\ H_2O$ Pollux A rare native hydrated cesium aluminum silicate, which occurs in the pegmatite of the Island of Elba

pollution (1) Contamination (2) The introduction of a deleterious substance into a water supply

pollux Pollucite

polonium Po = 218 2 Radio tellurium, dvitellurium The radioactive element, Ra*F*, atomic number 84, formed by disintegration of radium, and belonging to the sixth group of the periodic system It was the first radioactive decomposition-product discovered by Madame Curie (1898)

poly- A prefix derived from the Greek, meaning "many" (Latin multi)

polyamide A polymerisation product of a carboxylic acid (*e g*, adipic acid) and its aminated derivative, see *nylon*

polyacid base A compound that yields two or more hydroxyl ions, as $Ca(OH)_2$ $Al(OH)_3$

polyad Any element or radical with a valency greater than two, *e g* from triad to octad

polyadelphite A brownish-yellow to green manganese garnet

polyargyrite A native silver antimony sulfide

polyatomic (1) Describing a molecule which consists of three or more atoms (2) Polybasic (3) Polyacidic (4) Describing an organic compound containing two or more hydroxyl groups as, certain alcohols and sugars (glycerol, glucose)

polybasic acid A compound that yields two or more hydrogen ions per molecule in aqueous solution, as, H_2SO_4, H_3PO_4

polybasite Ag_9SbS_6 A native silver and antimony sulfide, containing copper

Polycarpeae A group of families of Phanerogams comprising Nymphaeaceæ Ranunculaceae, Magnoliaceae, Myristicaceae, Menispermaceae, Berberidaceae, Lauraceae

polyceptor An amboceptor that binds different complements

polychloral Hydronal

polychrom Esculin

polychromatic Showing more than one color, particularly if viewed by polarized light **pseudo-** Pseudodichromatic, pseudodichroic Showing more than one color when viewed by polarized light, but otherwise colorless

polychromatophile A cell or tissue that can be stained differentially with dyes

polycrase Euxenite

polycyclic Polynucleated Describing a molecule that contains two or more atomic rings as, naphthalene, phenanthrene Cf *ring systems*

polydymite A native nickel cobalt sulfide, $(Ni, Co)_4S_5$

polyene A compound containing many double bonds, as, the carotenoids **p grouping** A system of double bonds which are associated with color reactions, as, in carotene

polyethylene glycols. A polyglycol derived from ethylene glycol

polygalic acid. Polygalin

polygalin $C_{32}H_{54}O_{18}$ = 726 6 Polygalic acid An active principle obtained from *Polygala senega* Cf *senega*

polygamarin. A crystalline bitter principle from *Polygala amara*, a Polygalaceae

polygen An element that has two or more valencies, and thus forms two or more series

of compounds, as, iron (ferrous and ferric), or chlorine (chlorides, chlorites, and chlorates) Cf *periodic chain*

polygenetic Producing more than one phenomenon **p dye** A coloring material that gives two or more different shades with different mordants Cf *monogenetic*

polyglycols A dihydroxyether formed from two or more glycol molecules by dehydration *E g*, $(CH_2OH\ CH_2)_2O$, diethylene glycol, $\begin{matrix} CH_2OH\ CH_2 \\ MeCHOHCH_2 \end{matrix}\!\!>\!O$, ethylene-2-propylene glycol

polygon A plane figure bounded by 3 or more sides

Polygonaceae The buckwheat family, a group of herbs or woody plants, some of which are used as drugs

Rheum species	rhubarb
Rumex crispus	rumex
Rumex hymenosepalus	canaigre
Rumex acetosella	sheeps sorrel
Polygonum hydropiper	water pepper
Polygonum bistorta	bistort
Polygonum erectum	knot grass

Cf *lepathinic acid, nepalin, nepodin, polygonin*

polygonatum Solomon's seal

polygonin $C_{21}H_{20}O_{10}$ = 432 15 A glucoside from *Polygonatum cuspidatum*, a liliaceous plant of Japan and China

polygraph A device for recording the arterial and venous pulse waves, and other pulsations of the body surface, simultaneously Used as a "lie-detector"

polyhalite $K_2SO_4\ MgSO_4\ 2CaSO_4\ 2H_2O$ A native hydrated sulfate of calcium, magnesium and potassium from Stassfurt

polyhydrate A compound that contains more than two molecules of water

polyhydric A compound that contains more than two hydroxyl groups

polyhydrone $(H_2O)_x$ A polymer of hydrone (q v)

polymer(e) A member of a series of polymeric compounds

polymeric Related molecularly to an isomeric compound, but having a multiple of its molecular weight, as, acetylene and benzene, formaldehyde and paraformaldehyde See *polymerism*

polymericular weight The molecular weight of a polymerized molecule of an element

polymeride A member of a series of polymeric compounds, a polymer

polymerisation Polymerization

polymerism The phenomenon exhibited by certain organic compounds having the same percentage composition, but different molecular weights, the heavier being multiples of the lighter In such compounds the same elements are present in the same percentages, but the number of atoms and sometimes the structures are different, thus, C_2H_2, C_4H_4, C_6H_6, C_8H_8 are polymeric compounds See *polymerization*

polymerization. (1) A reaction in which two or more molecules of the same substance combine to form a compound, from which the original substance may or may not be regenerated (as, $3CH_3CHO = (CH_3)_3C_3H_3O_3$), the new molecular weight being a multiple of that of the original compound Cf *molecular association, hydrone* **aromatic-** The formation of an aromatic compound from two or more molecules of an aliphatic compound, as, benzene from acetylene, or hexamethylbenzene from crotonylene **carbohydrate-** The formation of monosaccharides from formaldehyde $6HCHO = C_6H_{12}O_6$ (see *photosynthesis*) **co-** The structural arrangement (*e g*, of rubber) in which 2 or more different monomers or types of group are present in alternate sequence in a chain **condensed-** A polymerization in which atomic displacement occurs to some extent, as in aldol polymerization and benzoin formation **photo-** See *photopolymerization* **true-** A union of two or more similar molecules in which the atoms remain in similar relative positions, as, hexaphenylethane from triphenylmethyl

polymerize To cause or undergo polymerization

polymers (1) A series of compounds having the same percentage composition, and containing different numbers of the same atoms (2) Compounds formed from two or more similar molecules, as, dimer, trimer, tetramer

polymeter (1) A measuring device that measures two or more different physical properties simultaneously (2) A hygrometer, thermometer and barometer mounted on the same board

polymethylene See *cycloparaffins* **p glycols** A polyglycol derived from methylene glycol, $CH_2(OH)_2$ or from its anhydride (formaldehyde), thus, $CH_2OH\ O\ CH_2OH$ dimethyleneglycol, $CH_2OH\ (O\ CH_2)_2CH_2OH$ trimethyleneglycol **p tetra sulfide** Thiokol

polymignite A native lime-niobium oxide containing numerous metallic oxides

polymorph A substance which occurs in two or more different forms

polymorphism The property of certain substances of crystallizing in two or more different systems *E g dimorphism*, crystallizing in two systems, as carbon (diamond-isometric, graphite-hexagonal), *trimorphism*, crystallizing in three systems, as sulfur, *tetramorphism*, crystallizing in four systems, as phosphorus See *isomorphism*

polynucleated Polycyclic

polyoxy- A prefix indicating more than three oxygen atoms **p methylene** A condensation-product of formaldehyde, $(CH_2O)_x$ Cf *paraformaldehyde*

polypeptides Compounds of two or more amino-acids, which contains one or more peptide groups, —CO NH— *E g*

dipeptides NH_2—R—CO NH—R—COOH, as, anserine, carnosine, glycylglycine, alanylglycine
tripeptides NH_2—R—CO NH—R—CO NH—R—COOH, as, glutathione, diglycylglycine, glutamylcysteylglycine
tetrapeptides NH_2—R—CO NH—R—CO NH—R—CO NH—R—COOH, as, triglycylglycine, alanyl-glycyl-leucyl-glycine

The higher polypeptides resemble the peptones and proteins An artificial octo-decapeptide (a synthetic protein with 18 molecules of amino acids) has been prepared, the number of different octo-decapeptides, by changing the sequence of the amino acids only, has been calculated to be 6,402,373,705,728,000 This does not include the many additional possibilities due to optical activity, hence, it is possible that each living organism has its own particular type of proteins, q v

polyphase Having more than one phase, as, an alternating electric current

polyphosphides Compounds of monovalent metals having the formula M_2P_n, as, K_2P_n

Polyporaceae A genus of spore-forming fungi, consisting of 2000 species, among which are the edible *Boletus*

polypyknotic Consisting of two independent components of different densities

polyquinoyl compound An organic compound containing four or more =CO groups *E g*, diquinoyl, $C_2H_2(CO)_4$, triquinoyl, $(CO)_6$

polysaccharides Polysaccharoses A group of carbohydrates containing more than three molecules of simple sugars The general formula is $(C_6H_{10}O_5)_x$ for polyhexoses, and $(C_5H_8O_4)_x$ for polypentoses They are theoretically derived from mono-, di- or trisaccharides by abstraction of water To this group belong starch, dextrin, glycogen and inulin, which hydrolyse to monosaccharides in a series of steps (staircase reaction) See *sugars, carbohydrate*

polysaccharose Polysaccharide

polysilicate See *silicate*

polystichalbin $C_{22}H_{26}O_9$ = 434 3 A constituent of filix extract, insoluble in water, soluble in hot alcohol

polystichin $C_{22}H_{24}O_9$ = 432 3 An acid obtained from the roots of *Aspidium* or *Polystichum* species (Filices)

polystichinin $C_{18}H_{22}O_8$ = 366 2 A constituent of aspidium extract

polystichinol $C_{21}H_{30}O_9$ = 426 3 A constituent of aspidium extract

polystichocitrin $C_{15}H_{22}O_9$ = 346 2 A constituent of aspidium extract

polystichoflavin $C_{24}H_{30}O_{11}$ = 494 2 A constituent of the rhizome of *Aspidium spinulosum* Cf *polystichum*

polystichum The dried roots of *Polystichum* (*Aspidium*) *spinulosum* and *Filix mas* (male fern), used medicinally, as the fluid extract, as an anthelmintic

polystyrene Polymerized styrene (q v) derived from petroleum, used as a basis for synthetic rubber and as an insulator

polysulfide A binary compound of sulfur, which contains more sulfur than is required by the normal valency of the metal, Na_2S is the normal sulfide, and Na_2S_2, Na_2S_3, Na_2S_4, and Na_2S_5, the polysulfides of sodium They are considered coordination compounds of neutral sulfur atoms attached to the sulfur ion **p ion** An electrically-charged group of atoms which contain two or more sulfur atoms, as AsS_2^-, AsS_3^-, AsS_3^{---}, AsS_4^{---}

polyterpenes A group of compounds which contain two or more terpene molecules of the general type, $(C_{10}H_{16})_x$

polythionate A salt of a polythionic acid (q v) of the general type, $M_2S_xO_6$, in which x is 2, 3, 4 or 5

polythionic acid Thionic acids A group of sulfur acids of the general type, $H_2S_xO_6$, where x is 2, 3 4, 5 or 6 *E g*,

$H_2S_2O_6$ = dithionic acid, $HO\,SO_2\,SO_2\,OH$

$H_2S_3O_6$ = trithionic acid, $HO\,SO_2\,S\,SO_2\,OH$

$H_2S_4O_6$ = tetrathionic acid, $HO\,SO_2\,S\,S\,SO_2\text{-}OH$

$H_2S_5O_6$ = pentathionic acid, $HO\,SO_2\,S\,S\,S\text{-}SO_2\,OH$

$H_2S_6O_6$ = hexathionic acid, $HO\,SO_2\,S\,S\,S\,S\text{-}SO_2\,OH$

polytrophic A bacterium or microorganism that produces two or more different types of fermentation

polytropy A form of polymorphism, q v

polyuronide A substance which yields a uronic acid or acids on hydrolysis

polyvalent Describing an element that has more than one valency Cf *multivalent, polygen*

p vaccine A suspension of two or more species of the same microorganism in a liquid

polyvinyl Describing a compound containing a number of vinyl, —CH CH_2, groups in a polymerised form **p acetate** $(CH_2\,CHOOC\,Me)_n$ A transparent thermoplastic solid, insoluble in water or mineral oils, soluble in most organic solvents, used as a heat-sealable adhesive, binder, plastic and size **p alcohol** $(CH_2\text{-}CHOH)_n$ A cream-colored powder, soluble in water, insoluble in most organic solvents, used as an adhesive, emulsifier and sizing agent for paper

polyzime A malt extract containing the enzyme constituents in an active or activated state

pomace The pressed residue from the extraction of apple juice in cider manufacture, used as a cattle-food

pomade A perfumed ointment, especially for the hair

pomegranate Granatum The dried bark of the stems and roots of *Punica granatum*, a Punicaceae It contains the alkaloids pelletierine, isopelletierine, and pseudopelletierine, used as the fluid extract, as an anthelmintic and teniafuge Cf *coccon, granatine, granatotannic acid* **p tannin** Ellagitannic acid

Pompey red Ferric oxide

Ponder's stain A solution of 0 02 gm toluidine blue in 1 cc glacial acetic acid, 2 cc absolute alcohol and 97 cc water

ponite A form of rhodocrosite containing iron

pontianac A resin of the copal type, used in the paint industry Cf *jelutong*

pontol A complex mixture of secondary and tertiary alcohols, used as denaturant for ethanol

poonahlite A hydrated calcium aluminum silicate from Poonah, India

poor gas A group of combustible gases from the blast furnace (Siemen's and Martin's furnace), also Mond gas and regenerator gas

Pope, Sir William Jackson 1870–1939 An English chemist noted for his work on crystallography and organic chemistry

poplar buds Balm of Gilead buds The air-dried, winter-leaf buds of *Populus nigra*, a Salicaceae, which have a pleasant aromatic odor, used medicinally as the fluid extract **p b oil** An essential oil from p , d 0 895–0 905, b 255–265, soluble in alcohol and containing humulene, sesquiterpenes and a paraffin

poplox A sodium silicate, see *intumescence*

poppy Mawseed The plant *Papaver somniferum*, a Papaveraceae **California- Eschscholtzia red-** Corn poppy, corn rose The flower-petals of *Papaver rhoeas*, used as an anodyne expectorant **p capsules** Papaveris fructus The dried, fully grown, unripe fruit of *Papaver somniferum*, a Papaveraceae, used medicinally **p seed oil.** A pale, yellow fixed oil from the seeds of *Papaver* species, m 5, insoluble in water, soluble in alcohol Used as a lubricant for fine machinery

populin $C_{20}H_{22}O_8\,2H_2O$ = 426 3 Benzoyl salicin $C_{13}H_{17}O_7\,C_7H_5O$ A glucoside from the bark of aspen species A light white powder, m 180, soluble in water, alcohol or ether, which yields benzoic acid and salicin on hydrolysis Used medicinally as an antipyretic

populoid The combined principles from the bark of *Populus tremuloides* (American aspen) or *P tremula* (European aspen) Used medicinally as a bitter tonic, astringent and mild antipyretic

porcelain A white, semiopaque, dense, waterproof substance obtained by strongly heating and sintering a mixture of kaolin, feldspar and quartz, m 850–1400 Used for many utensils (dishes, crucibles, etc), as well as for objects of art (ceramics) and in dentistry (teeth) Cf *sillimanite* **high fusing-** m 1340 (2440°F) **low fusing-** m 930 (1700°F) **medium fusing-** m 1260 (2300°F) All melting points are approximate **p burner** A bunsen burner made of porcelain **p clay** Kaolin **p color** A pigment used to color porcelain, especially a metallic oxide **p glaze** See *glaze* **p jasper** *Porcellanite* **p mill** A grinding machine made of porcelain, for either wet or drying grinding **p utensils** See *casserole, crucible, combustion boat, evaporating dish, funnel, mortar, retort, spatula*

porcellanite Porcelain jasper A fused or sintered clay and shale, which occurs at the borders of burned coal seams

pore A minute opening on a surface

porosimeter An instrument for the determination of the porosity of a substance, as a brick It measures the volume of liquid absorbed, or of air transmitted in a given time

porosity A condition in which a solid body is penetrated by minute open spaces filled with either liquids or gases P is expressed as the percentage of open-space volume with respect to the total volume Cf *permeability* **apparent-** The volume of open pore space per unit total volume **true-** The volume of both open and sealed pore spaces per unit total volume

porous Having interstices or minute cavities, penetrated by small open spaces

porpezite Palladium gold

porphin ring A heterocyclic structure consisting of 4 pyrrole rings united by methylene groups, in the center of which may or may not be a metal (Fe or Mg) It is a structural part of chlorophyll and hemoglobin, and is probably a flat molecule in which a slight oscillation of the metal will cause a rhythmic shift of all double bonds, thus making it a dynamic molecule See diagrams drawn to scale, using Pauling's atomic distances **aza-** See *tetra-aryl-*

porphyric acid Euxanthone

porphyrin An iron-free decomposition-product of hematin, as, hemoporphyrin $C_{16}H_{18}N_2O_3$, or a magnesium-free decomposition-product of chlorophyll, as, phylloporphyrin, $C_{16}H_{18}N_2O$ (q v)

porphyrine $C_{21}H_{21}O_2N_3$ = 351 2 An alkaloid from the bark of *Alstonia constricta*, an Apocynaceae A colorless substance, m 97, soluble in acids (blue fluorescent solution) Cf *alstonine*

porphyrite A coarse-grained igneous rock

porphyrization Reduction to a fine powder pulverization

porphyropsin The pigment of the eyes of freshwater fish

porphyroxine $C_{19}H_{23}O_4N$ = 329 19 An alkaloid of opium, m 135

porphyry An igneous rock in which relatively large, bright red crystals are set in a finer grained or glassy dark red ground-mass

porpoise oil A yellow fixed oil from porpoises

porporino (1) Hematoporphyrin (2) A decorative imitation of gold, which consists of an alloy of mercury, tin, and sulfur

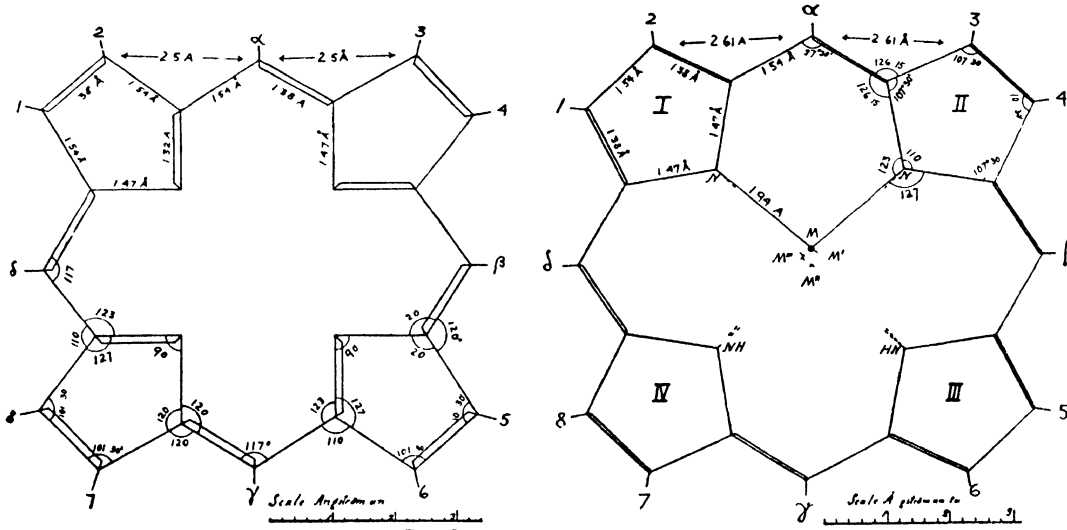
portland cement A hydraulic cement, obtained by burning a mixture of lime and clay and pulverizing the resulting clinker A greenish-gray powder which consists of basic calcium silicates, calcium aluminates, and calcium ferrites If mixed with water it solidifies to an artificial rock It derives its name from its similarity to Portland stone See *cement*

Portland stone A yellowish-white limestone from the Isle of Portland

Portsmouth accelerator P O T G Phenyl-*o*-tolyl guanidine, used as an accelerator in the vulcanization of rubber

posion A proposed name for anion Cf *negion*

positive (1) Not negative (2) Greater than zero **p crystal** A crystal whose refractive



Porphin ring drawn to scale

Left With 12 double bonds **Right** With 10 double bonds and central metal

PORPHIN DERIVATIVES

	M	1 3 5 8	2 4	7	6	γ
Chlorophyll group						
$C_{31}H_{34}N_4Mg$ etiophyllin	Mg	Me	Et	Et	—	—
$C_{31}H_{34}N_4O_2$ pyrroporphyrin	—	Me	Et	Pra	—	—
$C_{32}H_{34}N_4O_3$ rhodoporphyrin	—	Me	Et	Pra	COOH	—
$C_{43}H_{36}N_4O_4$ phylloporphyrin	—	Me	Et	Pra	—	Me
$C_{33}H_{34}N_4O_3$ phylloerythrin	—	Me	Et	Pra	—CO CH_2—	
$C_{34}H_{32}N_4O_5Mg$ chlorophyllin (?)	Mg	Me	Et	Pra	=C O CO CH— | | OMe OH	
$C_{55}H_{72}N_4O_5Mg$ chlorophyll a	Mg	Me	Et	Phy	—CH—CO— | COOMe	
$C_{55}H_{70}N_4O_6Mg$ chlorophyll b	Mg	Me	2—Et 4—CHO	Phy	—CH—CO— | COOMe	
Hemoglobin group						
$C_{30}H_{30}N_4O_4$ deuteroporphyrin	—	Me	—	Pra		—
$C_{30}H_{30}N_4O_4FeCl$ deuterohemin	FeCl	Me	—	Pra		—
$C_{32}H_{38}N_4$ *etioporphyrin III	—	Me	Et	Et		—
$C_{34}H_{32}N_4O_4FeCl$ hemin	FeCl	Me	Vin	Pra		—
$C_{34}H_{32}N_4O_4FeO$ hematin	FeO	Me	Vin	Pra		—
$C_{34}H_{32}N_4O_4FeOH$ protohematin	FeOH	Me	Vin	Pra		—
$C_{34}H_{34}N_4O_4$ protoporphyrin	—	Me	Vin	Pra		—
$C_{34}H_{36}N_4O_4FeCl$ mesohemin	FeCl	Me	Et	Pra		—
$C_{34}H_{38}N_4O_6$ hematoporphyrin	—	Me	Hyd	Pra		—
$C_{34}H_{38}N_4O_4$ mesoporphyrin IX	—	Me	Et	Pra		—
$C_{36}H_{38}N_4O_8$ coproporphyrin	—	Me	Pra	Pra		—
$C_{38}H_{38}N_4O_{16}$ uroporphyrin	—	Me	Iso	Iso		—
$C_{38}H_{38}N_4O_{16}Cu$ turacin	Cu	Me	Iso	Iso		—
Bile Pigments						

$C_{33}H_{36}N_4O_6$ bilirubin (protoporphyrin in which the alpha —CH= group is replaced by —OH and O=)

Me is $—CH_3$ (methyl)
Iso is —CH(COOH)COOH (isosuccinic acid)
Phy is $—CH_2CH_2COOC_{20}H_{39}$ (phytyl)
Hyd is —CHOH CH_3 (hydroxyethyl)
Pra is $—CH_2CH_2COOH$ (propionic acid)
Et is $—CH_2\,CH_3$ (ethyl)
Vin is —CH CH_2 (vinyl)

* Etioporphyrin I is 1 3 5 7—Me, 2 4 6 8—Et
Etioporphyrin II is 1 4 5 8—Me, 2 3 6 7—Et
Etioporphyrin IV is 1 4 6 7—Me, 2 3 5 8—Et

index for the extraordinary ray is greater than that for the ordinary ray **p electron** A positron, q v **p element** A light-metal or the element of the upper right and lower left of the new periodic table An element that will yield its valence electrons to another element and thereby, become positively charged An element which has, in general, less than four electrons in its outer valency shell **p group** A radical or group of atoms that is positively charged and base-forming, as, NH_4^+ **p nucleus** The center of an atom It is assumed to be extremely small in comparison with the sphere occupied by the electrons surrounding it, and to be composed either of tightly-packed electrons, hydrogen and helium kernels or made up of (*1Z*) neutrons, (*2Z*) protons and (*Z*) electrons, where *I* is the isotopic weight and *Z* the atomic number The positive nucleus of the atom is thought to be responsible for the atomic weight, atomic number, and radioactive properties of the element Suggested names *proton* (Rutherford), *hydrion* (Soddy), *centron* (Lodge), *ambron*, *merron*, *uron*, *prime*, *hylon*, and *prouton* **p ore** An ore that has been exposed and properly worked on four sides (Cf *possible ore*) **p radical** An atom or group of atoms that has lost one or more electrons and becomes positively charged **p rays** A stream of positively-charged molecules shooting from the anode toward the cathode in a discharge tube If the cathode is perforated, these rays can be made visible behind it by means of a fluorescent screen See *canal rays* **p ray analysis** See *mass spectrograph* **p reaction** A reaction which produces the effect sought

positron Oreston, positive electron A subatomic particle or fundamental "building stone" of matter, having a positive charge and a mass of $\frac{1}{1800}$ of a hydrogen atom Cf *particle*, *nucleus*

posode A proposed name for anode Cf *negode*

posologic Pertaining to medicinal doses

posology A branch of medicine and pharmacology that deals with the dosage of drugs, viz, the form, quantity and frequency of administering medicines

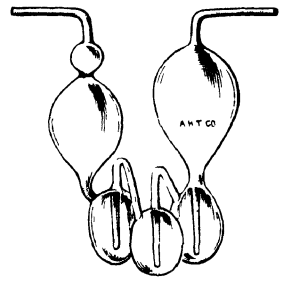
possible ore An ore that may exist out of sight, or below the lowest workings of a mine (Cf *positive ore*)

postulate An assumption, not capable of proof (1) An indisputable pre-requisite, (2) stipulated condition, (3) a demand Cf *axiom*

potable That which is drinkable without injury to health

potarite A native compound of palladium and mercury, erroneously known as allo-palladium (q v)

potash (1) Potassium hydroxide (2) Potassium carbonate **black-** A commercial grade of caustic *soda*, containing 5 % NaOH with iron oxide and sodium carbonate as impurities **caustic-** Potassium hydroxide **salvosal-** Potassium salol ortho-phosphite **p alum** Kalinite **p bulb** A glass apparatus which consists of three or more variously-shaped bulbs, filled with potassium hydroxide solution (see illustration) Used for the absorption of carbon dioxide in organic elementary analysis **p feldspar** Orthoclase **p glass** See *glass* **p mica** Muscovite **p water** Potassic water **p waterglass** See water*glass*



Potash bulb

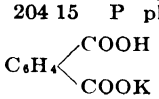
potassa Potassium hydroxide **p sulfurata** Potassium sulfide

potassamide NH_2K = 55 2 A substitution compound of ammonia, a white solid (if pure) or if impure, yellowish-brown inflammable substance, m 271, sublimes 400

potassic Containing potassium **p water** Potash water An aerated mineral water in which the potassium ions are in excess of the sodium ions

potassii The Latin for "of potash"

potassium K = 39 096 Kalium An alkali metal and element, atomic number 19 A silver-white, soft, wax-like substance, d 0 87, m 62, b 720, which reacts violently with water Since it rapidly oxidizes in air, it is always stored under a layer of coal oil Potassium occurs abundantly in its salts, as sylvenite, kainite and carnallite in Stassfurt (Germany) and Alsace It is widely distributed in smaller quantities in feldspars, rocks and soils, and was first prepared electrolytically in 1807 by Davy Its salts are all soluble in water and yield the colorless potassium ion, K^+ Potassium is typical of the alkali-metals, and forms only one series of compounds, valency of one It is prepared by electrolysis and is used as a reagent and reducing agent in many chemical reactions It is slightly radioactive in the metallic state, and emits a weak β-radiation **p acetate** $KC_2H_3O_2$ = 98 1 Potassii acetas diuretic salt CH_3COOK White, deliquescent powder, d 1 8, m 292, soluble in water or alcohol, insoluble in ether, used as a reagent, in buffer solutions, and medicinally *acid-* $KH(C_2H_3O_2)_2$ = 158 2 Colorless needles, m 148, decomp 200 **p acetotungstate** A double salt of potassium acetate and tungstate used in photographic toning solutions **p acetylsalicylate** $KC_9H_7O_4\,2H_2O$ = 254 19 White crystals, m 65 **p acid carbonate** P bicarbonate **p acid chromate** P dichromate **p acid phthalate** $KHC_6H_4O_4$ = 204 15 P phthalate,



A white crystalline powder, used as buffer **p acid sulfate** P bisulfate **p acid tartrate** P bitartrate **p alloys** The liquid or semi-solid mixtures of potassium with sodium

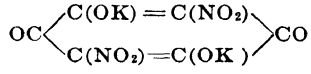
90 %K 10 %Na	80 %K 20 %Na	70 %K 30 %Na	60 %K 40 %Na	50 %K 50 %Na
m 17°C	−10°C	−3°C	5°C	11°C

p aluminate $K_2Al_2O_4\,3H_2O$ = 250 5 A colorless crystalline powder, soluble in water, insoluble in alcohol **p aluminum sulfate** $KAl(SO_4)_2\,12H_2O$ = 474 4 Potash alum kalinite A double salt of potassium and aluminum sulfate, large rhombic, colorless crystals, readily soluble in water Used extensively as a mordant **p amino chromate** $CrO_2(OK)\,NH_2$ = 155 13 Stable red crystals **p aminonaphthol** Helthin **p ammonium tartrate** $KNH_4C_4H_4O_6$ = 205 17 A white powder, very soluble in water **p amyl sulfate** $KC_5H_{11}SO_4$ = 206 2 A mixed ester or salt A white granular mass, soluble in water, slightly soluble in alcohol **p anthranilate** $KC_7H_6O_2N$ = 175 2 The p ester of anthranilic acid, $C_6H_4(NH_2)COOK$ A white crystalline powder, soluble in water **p antimonate** $KSbO_3$ = 207 3 P stibnate A white crystalline powder, slightly soluble in water, soluble in alkalis *pyro-* See *p stibnate* **p antimonyltartrate** $KSbOC_4H_4O_6\,\frac{1}{2}H_2O$ = 332 3 Tartar emetic Colorless octahedral crystals, d 2 6, slightly soluble in water **p argentocyanide** $KAg(CN)_2$ = 199 00 A substance which occurs in solutions of silver cyanide in potassium cyanide solution, used as a silver-plating solution **p arsenate** K_3AsO_4 = 256 3 Normal p arsenate Colorless crystals, soluble in water or alcohol, used as a reagent for detecting tannic acid and opium alkaloids *acid-* KH_2AsO_4 = 180 1 Colorless crystals, d 2 851, m 228, soluble in water, insoluble in alcohol, used in medicine as an alterative and reconstructive **p arsenite** $KAsO_2$ = 146 1 A grayish-white powder, soluble in water Used as a reagent, for detecting Ceylon cinnamon oil, medicinally as a tonic and stomachic, and as a reducing agent, in the manufacture of mirrors **p aurate** AuO OK,$3H_2O$ = 322 4 Soluble yellow needles **p aurichloride** $AuCl_3,KCl,2H_2O$ = 414 2 Soluble plates **p auricyanide** $Au(CN)_3KCN,\,H_2O$ = 358 4 A soluble colorless solid **p aurocyanide** AuCN KCN = 288 3 Colorless plates **p benzoate** $KC_7H_5O_2\,3H_2O$ 214 2 The p salt of benzoic acid, Ph COOK A white crystalline powder, soluble in water or alcohol, used medicinally as a mild antiseptic **p benzodisulfonate** $K_2C_6H_4(SO_3)_2$ = 314 3 The p salt of benzene disulfonic acid, $C_6H_4(SO_3K)_2$ Small colorless crystals, soluble in water, used in organic synthesis **p biborate** P tetraborate **p bicarbonate** $KHCO_3$ = 100 1 Acid p carbonate, potassii bicarbonas, saleratus (*sal aeratus*) Colorless, transparent, monoclinic crystals, d 2 17, decomp by heat soluble in water Used as a reagent in titrating arsenous and antimonous oxides, in the manufacture of potassium salts and inorganic synthesis, and in medicine **p bichromate** P dichromate **p bifluoride** See *p fluoride*, *acid-* **p biiodate** See *p iodate*, *acid-* **p**

binoxalate P bioxalate **p bioxalate** $KHC_2O_4 = 96\ 1$ P binoxalate, salt of sorrel, salt of lemons, salt acetosella White crystals or monoclinic prisms, soluble in water Used as a reagent, in medicine, in the manufacture of ink and stain removers, in photography, and for cleaning wood and metal **p biphosphate** See *p phosphate* **p bisaccharate** $KC_6H_9O_8 = 248\ 1$ The mono-p salt of saccharic acid $(CHOH)_4(COOH)COOK$ Yellowish crystals, soluble in water, used in medicine **p bismuth tartrate** $KBi_3C_4H_2O_9\ 4H_2O$ A granular white powder, soluble in water and used as antiluetic **p bisulfate** $KHSO_4 = 136\ 2$ Potassii bisulfas, p acid sulfate, sal enixum Colorless crystals m 197 (decomp), and soluble in water, used as a reagent and in the manufacture of effervescent drinks **p bisulfite** $KHSO_3 = 120\ 17$ P acid sulfite A white crystalline powder, decomp 190, soluble in water, used as an antiseptic and disinfectant **p bitartrate** $KHC_4H_4O_6 = 188\ 1$ Potassii bitartras, cream of tartar, depurated tartar A colorless crystalline powder, slightly soluble in water Used in volumetric analysis, as a reagent, and medicinally as a refrigerant and diuretic **p black** Suint ash **p borates** $K_2B_2O_4$, p metaborate, $K_2B_4O_7$, p tetraborate **p borofluoride** $KBF_4 = 126\ 0$ White crystals, soluble in alcohol **p borotartrate** A mixture of p metaborate and p bitartrate A white crystalline powder, d 1 832, slightly soluble in water Used medicinally as an antiseptic, and in photography to retard the action of developers **p bromate** $KBrO_3 = 167\ 0$ Colorless rhombohedral crystals, d 3 24, m 434, decomp 703, soluble in water, alcohol or ether Used as a reagent (Koppeschaar solution) for titrating phenol and oxalic acid, and as a standard in iodometry **p bromide** $KBr = 119\ 0$ Potassii bromidum White regular crystals, $d_{15°}$ 2 68, m 740, soluble in water or alcohol Used as a reagent, in photography, and medicinally as a nerve sedative and antispasmodic **p bromo-o-oxybenzoate** P bromosalicylate **p bromosalicylate** $KC_7H_4O_3Br = 255\ 1$ P bromo-o-oxybenzoate, $C_6H_3Br(OH)COOK$ White crystals, soluble in water, used medicinally as a hypnotic and antirheumatic **p butyrate** $KC_4H_7O_2 = 126\ 1$ C_3H_7COOK A white deliquescent crystalline powder, soluble in water **p cacodylate** $KC_2H_6O_2As\ H_2O = 194\ 1$ The p salt of cacodylic acid, Me_2AsO_2K Small white crystals, soluble in water, used medicinally as a tonic **p camphorate** $K_2C_{10}H_{14}O_4 = 276\ 3$ Colorless deliquescent crystals, soluble in water, used medicinally as an antiseptic **p carbonate** $K_2CO_3 = 138\ 2$ Potassii carbonas, sal tartar, potash Colorless monoclinic crystals or hygroscopic powder, d 2 2 m 900 (decomp), soluble in water, insoluble in alcohol Used as a reagent, as a flux for silicates and insoluble sulfates, as a neutralizing agent, in photography, and in medicine as an antiacid and mild caustic *acid-* See *p bicarbonate* **p carbonyl** $K_6(CO)_6 = 402\ 63$ Grey or red explosive crystals **p chlorate** $KClO_3 = 122\ 6$ Potassii chloras, p oxymuriate Colorless monoclinic crystals, d 2 34, m 357, decomp 400, soluble in water, slightly soluble in alcohol Used as a reagent for alkaloids, phenols, indican, as an oxidizing agent, in forensic and ultimate analysis, medicinally as a diuretic and cardiac stimulant, pharmaceutically in the manufacture of mouth washes and tooth pastes, and commercially in the manufacture of explosives, fulminators, and pyrotechnics **p chloraurate** $KAuCl_4,2H_2O = 774\ 3$ **p chloraurite** $KAuCl_2 = 307\ 3$ **p chloride** $KCl = 74\ 6$ Potassii chloridum White, regular crystals, d 1 984, m 776 (sublimes), soluble in water, alcohol or ether Used as a reagent, in the determination of fluosilicic acid, as a constituent of fertilizers and in explosives **p chlorochromate** $KClCrO_3 = 174\ 7$ Red crystals, decomp by water, used as an oxidizing agent **p chloroplatinate** $K_2PtCl_6 = 486\ 2$ Platinic potassium chloride Yellow regular crystals, d 3 291, decomp by heat, slightly soluble in water, used as a reagent **p chloroplatinite** $K_2PtCl_4 = 415\ 24$ Platinous potassium chloride Red crystals, soluble in water **p chromate** $K_2CrO_4 = 194\ 2$ Yellow, rhombohedral crystals, d 2 732, m 971, soluble in water, insoluble in alcohol Used as a reagent and indicator in volumetric analysis, as a mordant, and as an oxidizing agent in organic synthesis *acid-* P dichromate *chloro-* Potassium chloro-chromate **p chromic sulfate** $KCr(SO_4)_2\ 12H_2O = 499\ 42$ Chrome alum, chromium p sulfate Red or green, cubic or octahedral crystals, d 1 83, m 89, soluble in water, used as mordant **p chromicyanide** $K_3Cr(CN)_6 = 325\ 4$ A yellow insoluble solid **p cinnamate** $KC_9H_7O_2 = 186\ 1$ A white crystalline powder, soluble in water **p citrate** $K_3C_6H_5O_7 \cdot H_2O = 325\ 27$ Potassii citras Colorless crystals, d 1 198, decomp 230, soluble in water or alcohol, used medicinally as a diaphoretic and diuretic *monobasic-* $KH_2(C_6H_5O_7) = 230\ 15$ White crystals, soluble in water **p cobalticyanide** $K_3Co(CN)_6 = 332\ 36$ A solid, d 1 906 soluble in water, decomp by heat **p cobaltinitrite** $K_3Co(NO_2)_6 = 452\ 33$ Cobaltic p nitrite Yellow tetragonal crystals, decomp 200, slightly soluble in water, insoluble in alcohol or ether, used as a reagent. **p cobalt malonate** $KCo(C_3H_2O_4)_2 = 341\ 17$ Pink crystals, d 2 234, soluble in water **p cobalt sulfate** $K_2SO_4\ CoSO_4,\ 6H_2O = 437\ 4$ Soluble plates **p copper lead nitrite** $K_2CuPb(NO_2)_6 = 645\ 00$ Square or rectangular black crystals, produced by the triple nitrite reaction for potassium **p cuprocyanide** $KCu(CN)_2 = 154\ 69$ A solution of copper cyanide in potassium cyanide solution, used for copper plating **p cyanate** $KCNO = 81\ 12$ Colorless needles, d 2 048, soluble in water or alcohol, used in organic synthesis **p cyanide** $KCN = 65\ 12$ White regular crystals or sticks, d 1 52, soluble in water or alcohol Used as a reagent, in metallurgy for the extraction of gold (*cyanide process*), in photography, in medicine, and as an insecticide **p dichromate** $K_2Cr_2O_7 = 294\ 2$ P bichromate, p acid chromate Yellowish-red triclinic or monoclinic crystals, d 2 692, m 396 (decomp) soluble in water, insoluble in alcohol Used as a reagent for alkaloids, for standardizing volumetric solutions, as a general oxidizing agent, in cleansing solutions (with H_2SO_4), in electric batteries, medicinally as a bactericide, caustic and astringent, in photography, and in the dye, textile, tanning, printing, bleaching and oil industries **p dihydrogen phosphate**

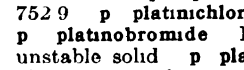
KH_2PO_4 See *p phosphates* **p disulfate** $K_2S_2O_7$ = 254 32 White needles, d 2 27, m 210 (decomp) soluble in water **p dithionate** P hyposulfate **p dithio oxalate** $K_2C_2O_2S_2$ = 198 32 A solid, used as reagent for nickel **p ethyl sulfate** $KC_2H_5SO_4$ = 164 1 Monoclinic white crystals, d 1 843, soluble in water or alcohol **p. ethyl xanthate** $KC_3H_5OS_2$ = 160 28 A white powder, used as a collector in flotation **p ferrate** K_2FeO_4 = 198 05 P perferrate A purple solid stable in alkaline solution, rapidly decomposed in acid solution **p ferric ferrocyanide** $KFe'''Fe''(CN)_6 H_2O$ Prussian blue A blue, insoluble precipitate from ferric ion and ferrocyanide **p ferric oxalate** $K_3Fe(C_2O_4)_3 3H_2O$ = 491 19 Brown crystals, decomp 230 slightly soluble in water **p ferric sulfate** $K_2SO_4,Fe_2(SO_4)_3,24H_2O$ = 1006 60 Iron alum Soluble violet crystals **p ferricyanide** $K_3Fe(CN)_6$ = 329 1 Red prussiate of potash, ferric potassium cyanide Ruby-red, monoclinic crystals, d 1 81, decomp by heat, soluble in water or alcohol Used as a reagent for ferrous salts, as a reducing agent and indicator in volumetric analysis, as a reagent in organic chemistry and synthesis, in the manufacture of prussian blue, in the textile industry, and in photography for blueprint paper and other light-sensitive papers **p ferrite** $K_2Fe_2O_4$ = 253 90 A yellow solid **p ferrocyanide** $K_4Fe(CN)_6 3H_2O$ = 422 4 Yellow prussiate of potash, ferrous p cyanide Yellow monoclinic crystals, d 1 853, soluble in water, insoluble in alcohol Used as a reagent for ferric ion, copper, and other metals, in quantitative analysis, in organic chemistry, in electro-plating in the textile industry, in the manufacture of prussian blue, for hardening steel, and in photography **p ferrous ferricyanide** $K_2Fe''Fe'''(CN)_6$ = 357 9 A white precipitate produced by the addition of ferrous sulfate to a cold neutral solution of p ferrocyanide It is oxidized to *β*-soluble prussian blue **p fluorescein** $K_2C_{20}H_{10}O_5$ = 408 3 The p salt of fluorescein A yellowish-red powder, soluble in water to form a pink solution with a green fluorescence **p fluoride** KF = 58 1 A colorless crystalline, hygroscopic powder, KF $2H_2O$, d 2 481, m 860, soluble in water Used as a preservative, in ant powders, as a disinfectant, and in etching glass *acid-* KF - HF = 78 1 P bifluoride, Fremy's salt Colorless crystals, soluble in water, used as an antiseptic and antizymotic, and in the etching of glass **p fluosilicate** K_2SiF_6 = 220 5 Colorless hexagonal crystals, d 2 665, insoluble in water, soluble in hydrochloric acid **p formate** $KCHO_2$ = 84 2 The p salt of formic acid, H COOK Colorless deliquescent crystals, d 1 91, m 197, soluble in water **p glycerinate** $KC_3H_5O_4$ = 144.1 A white deliquescent powder, soluble in water **p glycerophosphate.** $K_2C_3H_7O_3PO_3$ = 264 4 Hygroscopic white crystals, soluble in water It is sold as a 50–75 % solution, used medicinally as a nerve tonic, and as a reagent **p hippurate** $KC_9H_8O_3N H_2O$ = 235 2 Colorless crystals, slightly soluble in water, soluble in alcohol **p hydrate** P hydroxide **p hydride** KH = 40 11 White volatile needles, formed when potassium is heated in a stream of hydrogen gas **p hydrogen phosphate** K_2HPO_4 = 174 25 Large crystals, used as a buffer See *p phosphates* **p hydrosulfide** P hydrosulfide **p hydroxide** KOH = 56 11 Potassii hydroxidum, potash, p hydrate, caustic potash, kalilauge White rhombohedral crystals or deliquescent sticks, d 2 044, m 360 (sublimes), soluble in water, alcohol or ether It absorbs carbon dioxide from the air and must be kept in tight containers Used as a reagent in analysis for neutralization, and in large quantities in the manufacture of soft soap, oxalic acid and glass Cf *lapis causticus, vienna caustic* **p hydrosulfide** KSH = 72 1 P hydrogen sulfide Colorless hygroscopic crystals m 455, soluble in water **p hydrotartrate** P bitartrate **p hypochlorite** KClO = 90 6 Colorless crystals, decomp by heat, soluble in water Cf *Eau de Javelle* **p hypophosphite** KH_2PO_2 = 104 1 Potassii hypophosphis, diacid potassium phosphate White, opaque plates or deliquescent powder, soluble in water or alcohol, insoluble in ether Used as a nerve tonic **p hyposulfate** $K_2S_2O_6$ = 238 3 P dithionate Colorless crystals, d 2 28, soluble in water, decomp by heat **p hyposulfite** $K_2S_2O_3$ = 190 3 P thiosulfate Colorless hygroscopic crystals, soluble in water **p indigosulfate** $K_2C_{16}H_8O_8N_2(SO_3)_2$ A dark-blue powder, soluble in water, used in dyeing textiles **p indigosulfonate** P indigosulfate **p indoxylsulfonate** Indican (2) **p iodate** KIO_3 = 214 02 Colorless, regular, deliquescent crystals, d 3 975, m 560 (decomp), soluble in water, insoluble in alcohol, used as a reagent for volumetry, and medicinally as an antiseptic *acid-* KHI_2O_2 = 389 8 P biiodate Colorless crystals, slightly soluble in water, soluble in dilute acids, used in volumetric analysis **p iodide** KI = 166 02 Potassii iodidum Colorless regular crystals, d 3 115, m 680, b 723, soluble in water, alcohol, or ether Used as a reagent, in volumetric analysis, as a solvent for iodine and iodides, medicinally as an antiseptic and alterative, and in photography *tri-* See *p triiodide* **p iodohydrargyrate** Mercuric p iodide **p iodotetrachloride** $KICl_4$ = 307 86 **p ion** The positively-charged potassium atom, K^+, a potassium atom that has lost one negative electron **p isovalerate** $KC_5H_9O_2$ = 140 17 White or yellowish hygroscopic crystals, very soluble in water **p lactate** $KC_3H_5O_3$ = 128 2 A colorless or yellowish syrupy liquid, soluble in water **p lithium tartrate** $KLi(C_4H_4O_6) H_2O$ = 221 09 White monoclinic crystals, d 1 610, soluble in water, used as an antirheumatic **p malate** $K_2C_4H_4O_5$ = 210 3 A colorless syrupy liquid, soluble in water **p magnesium chloride** KCl, $MgCl_2$, $6H_2O$ = 277 90 A colorless solid, decomp by heat **p manganate** K_2MnO_4 = 197 13 Dark-green, rhombohedral crystals, decomp 190, soluble in water *per-* See *p permanganate* **p manganic sulfate** $K_2SO_4 - Mn_2(SO_4)_3$, $24H_2O$ = 1004 8 Mangan alum Green crystals, soluble in water **p manganicyanide** $K_6Mn_2(CN)_{12}$ = 656 6 A soluble red solid **p manganocyanide** $K_5Mn_2(CN)_{12}$, $6H_2O$ = 842 9 A soluble red solid **p mercuric iodide** Mercuric p iodide **p mercuric thiosulfate** Mercuric p thiosulfate **p metabisulfite** $K_2S_2O_5$ = 222 32 P pyrosulfite White soluble plates, decomp by heat **p metaborate** $K_2B_2O_4$ = 163 8 P borate A white powder, soluble in water

p metaphosphate KPO_3 See *p phosphates* **p metasilicate** K_2SiO_3 See *p silicates* **p methane disulfonate** $(KSO_3)_2CH_2$ = 252 34 Monoclinic crystals, d 2 376, soluble in water **p methylsulfate** $KMeSO_4$ = 150 2 P methyl sulfuric ester A white crystalline powder, soluble in water or alcohol **p molybdate** $K_2MoO_4\,5H_2O$ = 328 10 A white, microcrystalline powder, soluble in water **p monosulfide** P sulfide **p myronate** $KC_{10}H_{18}O_{10}NS_2$ = 415 2 Sinigrin A colorless crystalline glucoside salt from black mustard seeds Soluble in water or alcohol, and decomposed by myrosin into glucose, potassium bisulphate and allyl thiocyanate **p naphthalene-*1 5*-disulfonate** $K_2C_{10}H_6O_2S_2\,2H_2O$ = 336 40 White powder, d 1 797, soluble in water **p nickel sulfate** $K_2SO_4,NiSO_4,6H_2O$ = 437 10 A blue solid, d 2 12 **p nitranilate** $K_2C_6O_8N_2$ = 306 22



potassium dinitro dihydroxy benzoquinone A greenish-yellow crystalline powder, slightly soluble in water, soluble in alcohol **p nitrate** KNO_3 = 101 1 Saltpeter, potassii nitras, nitre, sal prunella Colorless prismatic or rhombohedral crystals, d 2 109, m 337 (decomp), soluble in water, insoluble in alcohol or ether Used as a reagent, as an oxidizing flux, as an oxidizing agent, medicinally as a diaphoretic and diuretic and in pyrotechnics, gunpowder, fertilizers and preservatives **p nitrite** KNO_2 = 85 1 Colorless, deliquescent prismatic crystals or sticks, d 1 915, soluble in water or alcohol Used as a reagent for cobalt, amino-acids, phenols, iodine, and many other organic compounds, as a reducing agent and in organic synthesis, in the manufacture of aniline dyes, diazo dyes, and other dyes, and medicinally, as a heart tonic Cf *Indian yellow* **p nitroso hydroxylamine sulfonate** $K_2SO_3N(OH)NO$ = 218 24 **p oleate** $KC_{18}H_{33}O_2$ = 320 5 A yellow mass, soluble in water or alcohol, used medicinally as a soap **p osmate** $K_2OsO_4\,2H_2O$ = 369 3 P perosmate Dark purple or garnet-red crystals, soluble in water They decompose in a warm and moist atmosphere, used as a reagent for nitrogen, and medicinally as a sedative **p oxalate** $K_2C_2O_4\,H_2O$ = 184 2 Colorless monoclinic crystals, d 2 08, decomp by heat, soluble in water Used as a reagent, in photography, and in the manufacture of stain- and ink-removers *acid-* KHC_2O_4 = 128 11 Monoclinic crystals, d 2 0, slightly soluble in water *acid- (hemihydrate)* $KHC_2H_4\,\frac{1}{2}H_2O$ = 137 12 Trimetric crystals *acid- (monohydrate)* $KHC_2H_4\,H_2O$ = 146 2 Rhombic crystals *tetra-acid-* $KH_3(C_2O_4)_2\,2H_2O$ = 254 15 Triclinic crystals, d 1 836 **p oxide** K_2O = 94 2 Burnt potash, calcined potash Colorless octahedral crystals, or grayish powder, d 2 656, soluble in water Used extensively as a reagent, and in the manufacture of potassium salts Cf *p peroxide.* **p oxymuriate** P chlorate **p palladichloride** K_2PdCl_6 = 397 7 Palladio p chloride A red, soluble solid, decomp by heat **p palladochloride** K_2PdCl_4 = 326 7 Palladous p chloride Greenish-brown prisms, soluble in water, decomp by heat **p parawolframate.** P tungstate **p pentasulfide** K_2S_5 = 238 50 A yellowish granular mass, soluble in water, m 220 **p perborate** KBO_3 = 98 0 A soluble solid **p percarbonate** $K_2C_2O_6\,H_2O$ = 216 3 A colorless powder, decomp by water (forming bicarbonate and oxygen) and acids (forming hydrogen peroxide and carbon dioxide) Used as a reagent, in microscopy, in photography (antihypo), and as a bleaching agent **p perchlorate** $KClO_4$ = 138 6 Colorless rhombic crystals, d 2 524, m 610, slightly soluble in water, insoluble in alcohol Used as a reagent and oxidizing agent, in pyrotechnics, medicinally as an antipyretic and sedative, and as a source of oxygen **p perferrate.** P ferrate **p periodate** KIO_4 = 230 0 A colorless, rhombic, crystalline powder, d 3 168, m 582, slightly soluble in water, used as a color reagent for manganese. **p permanganate** $KMnO_4$ = 158 0 Potassii permanganas, p hypermanganate Deep purple, lustrous, rhombic needles, d 2 703, decomp 240, soluble in water Used as a reagent in volumetric analysis, as an **oxidizing agent,** in bleaching and disinfecting, for mordants, in the synthesis of dyes, and in photography, medicinally, as an external antiseptic and disinfectant, and for external application to snake bites **p perosmate** P osmate **p peroxide** K_2O_2 = 110 2 or K_2O_4 = 142 2 A yellow powder, rapidly decomp when exposed to air and moisture, soluble in alcohol, used as a strong oxidizing agent and oxidizing flux **p perruthenate** $KRuO_4$ = 204 8 Black crystals, slightly soluble in water **p persulfate** KSO_4 = 135 2 or $K_2S_2O_8$ = 270 4 Anthion Colorless prismatic crystals, decomp by heat, slightly soluble in water Used as a strong oxidizing agent, in photography (anthion), and medicinally as a disinfectant **p phenolsulfonate** $KC_6H_4(OH)SO_3\,H_2O$ = 230 2 P sulfocarbolate *ortho-* Colorless crystals, d 1 734, m 400, soluble in water or alcohol, used medicinally as an intestinal antiseptic *para-* Rhombic crystals, d 1 87 **p phenylate** PhOK = 132 1 P phenate Colorless crystals, soluble in water, used as an antiseptic **p phosphates** (1) K_3PO_4 = 212 3 Normal ortho- or tribasic p phosphate Colorless rhombic crystals, slightly soluble in water, insoluble in alcohol (2) K_2HPO_4 = 174 3 P hydrophosphate, dipotassium phosphate, monoacid phosphate Colorless crystals, soluble in water (3) KH_2PO_4 = 136 2 Monobasic p phosphate, dihydrophosphate, Sorensen's potassium phosphate Colorless tetragonal crystals, d 2 338, m 96, decomp by heat, soluble in water, insoluble in alcohol Used as a reagent, and in the preparation of buffer solutions for *p*H determinations (4) $K_2P_2O_7\,3H_2O$ = 306 27 P pyrophosphate Colorless crystals, d 2 33, soluble in water, insoluble in alcohol (5) KPO_3 = 118 14 P metaphosphate An unstable solid **p phosphide** K_3P_5 = 233 2 An unstable yellow solid **p phosphite** (1) K_2HPO_3 = 158 0 White powder, decomp by heat, soluble in water, insoluble in alcohol (2) K_3PO_3, normal phosphite (3) KH_2PO_3, monobasic or dihydrophosphite **p phthalate** (1) $C_6H_4(COOK)_2$ (2) See *p acid phthalate* **p picraminate** $KC_6H_4O_5N_3$ = 223 2 P dinitroaminophenate, $C_6H_2(OK)(NH_2)(NO_2)_2$ A dark brown crystalline powder, soluble in

water, insoluble in alcohol **p picrate** $KC_6H_2O_7N_3$ = 267 1 Potassium trinitrophenate, $C_6H_2(NO_2)_3OK$ Yellow crystals, d 1 852, slightly soluble in water, insoluble in alcohol, used in explosives **p piperinate** $KC_{12}H_9O_4$ = 256 2 A yellow powder, slightly soluble in water **p platinibromide** K_2PtBr_6 = 752 9 **p platinichloride** P chloroplatinate **p platinobromide** K_2PtBr_4 = 593 0 An unstable solid **p platinochloride** P chloroplatinite **p platinocyanide** $K_2Pt(CN)_4,3H_2O$ = 431 5 An unstable solid **p plumbate** $K_2PbO_3,3H_2O$ = 387 45 Colorless crystals, soluble in water **p plumbite** K_2PbO_2 = 317 3 or $KHPbO_2$ = 279 21 **p propionate** $KC_3H_5O_2$ = 112 2 Small colorless crystals, soluble in water **p pyroantimonate** P stibnate **p pyroborate** P tetraborate **p pyroborate** P tetraborate **p pyrophosphate** See *p phosphates* (4) **p pyrosulfate** $K_2S_2O_7$ = 254 3 A white crystalline powder, d 2 27, soluble in water **p pyrosulfite** P metabisulfite **p rhodanate** Potassium thiocyanate **p ruthenate** K_2RuO_4 = 244 0 A brownish-black powder, soluble in water *per-* See *p perruthenate* **p salicylate** $KC_7H_5O_3$ = 176 2 A white crystalline powder, soluble in water or alcohol, used medicinally as an antirheumatic and antipyretic **p salol orthophosphite** Salvosal potash The potassium salt of salol-o-phosphorous acid



Colorless crystals, soluble in cold water, it is used medicinally for influenza and gout **p santonate** $KC_{15}H_{19}O_4 \cdot H_2O$ = 320 3 Colorless syrupy liquid, soluble in water **p selenate** K_2SeO_4 = 221 4 A colorless crystalline powder, soluble in water **p silicate** $K_2Si_2O_5$ = 154 5 or $K_2Si_2O_5$ = 214 3 Potash-waterglass Transparent glass-like masses, soluble in water, insoluble in alcohol See also *p tetrasilicate* **p silicate solution** Potash-waterglass An aqueous, syrup-like solution of potassium silicate, 30–38°Bé, miscible with water in all proportions Used for fire-proofing textiles, wood, and cardboard, as a cement and glue, in bleaching, and in the manufacture of soap **p silicofluoride** K_2SiF_6 = 220 5 A white powder, soluble in water, used in the manufacture of metallic silicon **p silver cyanide** $KAg(CN)_2$ = 199 0 Colorless regular crystals, soluble in water or alcohol **p sodium antimonyl tartrate** $KNa(SbO)C_4H_3O_6$ = 346 88 White powder soluble in water **p sodium carbonate** $KNaCO_3(H_2O)$ = 230 20 A white solid, readily soluble in water **p sodium tartrate** $KNaC_4H_4O_6$ = 210 1 $+4H_2O$ = Rochelle salt $+3H_2O$ = Seignette salt A colorless crystalline double salt, soluble in water Used as a reagent (in Fehling's solution), as a depilatory, and medicinally **p sozoiodol** $C_6H_2I_2(SOH)OK$ = 431 8 P diiodo-p-sulfonic acid phenate Used medicinally, as a desiccant for eczema **p sozoiodolate** $C_6H_2I_2(SOK)OH$ = 431 8 P diiodo-p-phenolsulfonate A colorless, odorless, crystalline powder, soluble in water, used medicinally as a dusting powder for skin diseases **p stannate** K_2SnO_3 = 244 9 Colorless crystals, soluble in water, used in the textile industry as a mordant **p stannosulfate** $K_2Sn(SO_4)_2$ = 388 8 P stannous sulfate, Marignac salt Colorless crystals, soluble in water, used as a reagent for mercury and bismuth salts, and in volumetric analysis **p stearate** $KC_{18}H_{35}O_2$ = 322 5 A white crystalline powder, soluble in hot water or alcohol **p stibnate** (1) $K_2H_2Sb_2O_7\,6H_2O$ = 543 8 P pyroantimonate A granular, white powder, slightly soluble in water, used as a reagent for sodium salts (2) P antimonate **p succinate** $K_2C_4H_4O_4$ = 194 3 A white powder, soluble in water, used medicinally **p sulfate** K_2SO_4 = 174 3 Potassii sulfas, normal p sulfate, tarcanum, sal de duobus, tartarus vitriolatus White rhombic or hexagonal crystals, d 2 663, m 1076 (sublimes), soluble in water, insoluble in alcohol Used as a reagent, medicinally in place of saline, in fertilizers, and in the manufacture of artificial mineral waters and baths *acid-* $KHSO_4$ = 136 2 Monobasic or monoacid p sulfate Colorless monoclinic or rhombic crystals, d 2 24 m 200, soluble in water *pyro-* See *p pyrosulfate* **p sulfide** K_2S = 110 3 P monosulfide Brown crystals, d 2 13, soluble in water or alcohol **p sulfides** K_2S, K_2S_2, K_2S_3, K_2S_4, K_2S_5 Commercial "p sulfide" is usually a mixture of some or all of these **p sulfite** $K_2SO_3\,2H_2O$ = 194 3 A white crystalline powder, decomp by heat, soluble in water Used as a reagent, in the textile industry as a mordant, and medicinally, as an antiseptic and laxative *acid-* $KHSO_3$ = 120 2 P bisulfite Colorless needles, decomp by heat, soluble in water **p sulfocarbolate** P phenylsulfonate **p sulfocarbonate** K_2CS_3 = 186 2 Orange, hygroscopic crystals, soluble in water, used medicinally in skin diseases **p sulfocyanate** P thiocyanate **p sulfocyanide** P thiocyanate **p sulfophenylate** P phenylsulfonate **p tannate** $KC_{14}H_9O_9$ = 360 1 A brown powder, soluble in water **p tartrate** *d-* $K_2C_4H_4O_6\,\frac{1}{2}H_2O$ = 235 3 Tartarus soluble tartar, sal vegetal, normal p tartrate Colorless monoclinic crystals, d 1 9715, soluble in water, used as a reagent, and medicinally as a refrigerant and laxative *sodium-* P sodium tartrate *dl-* $K_2C_4H_4O_6$ = 226 23 Monoclinic crystals, d 1 984 *d-acid-* $KHC_4H_4O_6$ = 188 14 Rhombic crystals, d 1 956 *dl-acid-* Monoclinic crystals, d 1 954 **p tellurate** $K_2TeO_4\,5H_2O$ = 359 7 Colorless crystals, soluble in water, used medicinally *acid-* $KHTeO_4$ = 231 6 Colorless crystals, soluble in water **p tellurite** K_2TeO_3 = 253 3 A colorless amorphous powder, soluble in water **p tetraborate** $K_2B_4O_7\,5H_2O$ = 324 3 Potassium borate Colorless hexagonal prisms soluble in water **p tetraoxalate** $KH_3C_4O_8\,2H_2O$ = 254 1 A double salt of oxalic acid and monoacid p oxalate, $(COOH)_3COOK$ Colorless monoclinic prisms, soluble in water, used as a standard in volumetric analysis **p tetrasilicate** $K_2Si_4O_9$ = 334 6 A solid, soluble in water, insoluble in alcohol **p thiocyanate** KCNS = 97 2 P sulfocyanide, p sulfocyanate, p rhodanate Colorless deliquescent prisms d 1 906, m 162, soluble in water or alcohol Used as a reagent for ferric salts (red), copper (blue) and silver (white) salts, and other compounds **p thiocyanide** P thiocyanate **p thiosulfate** $K_2S_2O_3\,H_2O$ = 208 36 Very soluble prisms, insoluble in alcohol **p triiodide** KI_3 = 419 86 Prismatic crystals

d 3 50, m 45 (decomp), soluble in a solution of p iodide **p tungstate** $K_6W_7O_{24}\,6H_2O$ = 2015 0 P parawolframate, $3K_2O\,7WO_3\,6H_2O$ White crystalline powder, soluble in water **p uranium oxalate** $K_4U(C_2O_4)_4\,5H_2O$ = 836 62 Yellow monoclinic crystals, d 2 563 **p urate** $K_2C_5H_2O_3N_4$ = 244 5 A white powder, soluble in water **p valerate** $KC_5H_9O_2$ = 140 2 A white crystalline powder, soluble in water, used medicinally as a nerve sedative **p wolframate** $K_2WO_4\,5H_2O$ = 416 4 A white, hygroscopic, crystalline powder, soluble in water, insoluble in alcohol used in preparing bronzing solutions **p xanthate** KS_2COEt = 160 28 A salt decomposed by acid into alcohol and carbon disulfide, hence the structure $SC\langle^{SK}_{OEt}$ Light yellow prisms, d-1 558, decomp 200, very soluble in water Used as a flotation agent, as a soil fumigant, and as a chemical reagent in the separation of nickel and cobalt **p zincate** K_2ZnO_2 = 175 7 A colorless amorphous powder, soluble in alkalis

potato The rhizome of *Solanum tuberosum* **sweet-** The rhizome of *Ipoemoea batatus* **p culture** A slice of potato used as culture medium for bacteria **p gum** Euphorbia gum **p spirit** Fusel oil **p starch** See *starch*

potency (1) mathematical Power, the magnitude or dimension, or the number of times a number is multiplied by itself *Eg* ,

10^{11} = 100,000,000,000
10^{10} = 10,000,000,000

and so on, to —

10^{-1} = 0 1
10^{-2} = 0 01
10^{-3} = 0 001 and so on

(2) therapeutic The strength or power of activity of a drug (3) homeopathic The dilution of a remedy in a neutral medium corresponding with the mathematical potency

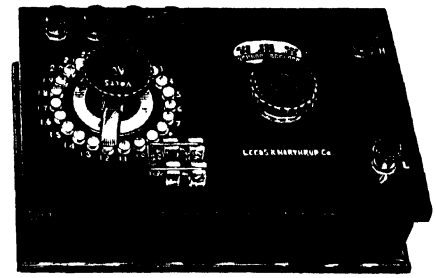
potential (1) Stored-up energy or power capable of performing work (2) Voltage

low-	less than 301 volts
medium-	from 301–651 volts
high-	greater than 651 volts

absolute- See *mercury cathode* **electric-** Electromotive force **electrolytic-** See *electroaffinity* **hydrogen-** See p_H **ionic-** See *ionic* **magnetic-** Magnetomotive force **oxido-reduction-** See r_H **pseudo-** The electrokinetic potential set up between ions adsorbed on the surface of a solid immersed in a liquid, and those in the bulk of the liquid **super-** Overvoltage

p difference The difference in voltage between the electrodes of a battery, vacuum tube or thermocouple With an electrical cell it is the difference between the electrode potentials of the electrodes **p energy** (1) The heat capacity of a compound (2) The energy of a body due to its position (as a lifted weight, or water in a high storage tank) **p mediator** A substance used to accelerate the establishment of an equilibrium in measurements of oxidation-reduction potentials Cf *poiser*

potentiometer A low-resistance instrument for the accurate determination of small differences in electric potentials by Poggendorff's method q v Cf *galvanometer, hydrogen-ion recorder*



Potentiometer

potentiometric titration A method of quantitative analysis in which the electric potential of an electrode immersed in the solution to be titrated is continually determined until a rapid change corresponding with the end of the reaction is reached Cf *hydrogen-ion determination, Hildebrand electrode, conductometric analysis*

P O T G Portsmouth accelerator

pothole A natural cavity in the earth surface that is usually more deep than wide, and is often filled with a deposit of salts, as, sodium carbonate It may be formed by the grinding action of pebbles carried in a stream of water

potstone Talc

potters' clay A pure, plastic clay, free from iron, (see *pipeclay*) **p lead** Alquifou **p ore** Alquifou

pottery Ware made from clay, molded while soft and moist, baked and hardened by heat *Eg* ,
earthenware relatively soft and fusible, and (a) unglazed, (b) glazed, (c) lustrous, (d) enameled,
stoneware hard, infusible and containing more silica (See *porcelain*)

pounce Powdered cuttlefish bones, formerly used for drying ink

pound lb , # A unit of weight in the English system The weight in vacuo of a platinum cylinder known as the Imperial Standard Pound Cf *pfund* **apothecaries'** = 12 oz = 96 drams = 288 scruples = 5760 grains = 0 37 kg or 373 24177 grams **avoirdupois-** = 16 oz = 7000 grains = 0 453 kg or 453 592338 grams = 16 fluid oz **gee-** Slug **troy-** (for gold and silver etc) = 5760 grains = 16 oz

pound per square inch A unit of pressure (see *atmosphere*)

pound-mol The number of pounds of a gas numerically equal to its molecular weight Its volume is 359 cubic ft

poundal The British unit of force F P S system (cf *C G S* and *M K S systems*) The force that will impart, in one second, a velocity of one foot per second to a mass of one pound, 1 poundal = 1 pound accelerated 1 foot per second each second = 13825 5 dynes

pour The flow of a liquid under gravity **p point** (1) The lowest temperature at which an oil will flow under standard conditions (2) The temperature at which an alloy is cast

powder (1) An aggregation of ground, loose material in small solid particles (2) Any explosive used in blasting and gunnery **algaroth-** Precipitated antimonous oxychloride

antiseptic- A finely-ground antiseptic substance, for external application to wounds **baking-** See *baking powder* **bleaching-** See *bleaching* **dusting-** See *dusting* **effervescent-** A mixture of salts that develops carbon dioxide when dissolved in water **flameless-** An explosive that produces little or no muzzle-flash **insect-** (1) See *insect powder* (2) A mixture of drugs used as an insecticide **Seidlitz-** A mixture of Rochelle salt, sodium bicarbonate and tartaric acid, used to make an effervescent saline water **smokeless-** Any explosive with little or no smoke-formation when burning

powellite $CaMoO_4 CaWO_4$ A native calcium molybdate and tungstate, small yellow tetragonal prisms

powellizing Hardening wood by impregnating with a saccharin solution

power (1) Potency (2) The time-rate of doing work $P = dW/dT$, or $P = WT^{-1} = ML^2T^{-3}$, where W = work, T = time, M and L are the absolute units of mass and length respectively (3) See *diopter*

power transmission Methods (1) mechanical or direct, (2) hydraulic or by water columns, (3) pneumatic or compressed air, (4) steam in pipes, (5) electricity, through wires

power units See *watt, kilowatt, horsepower*

pozzolana (1) Puzzolane, q v (2) A substance which is mixed with lime mortar in addition to, or in partial substitution for, sand, in order to increase its strength **artificial-** Burnt clay, granulated slag, certain clinkers and burnt oil-shale **natural-** Volcanic ash and celite

pozzolanic action Chemical actions, as the result of which insoluble compounds are formed in cement

P P Abbreviation for the pellagra-preventing factor of vitamin B, q v

P P D Piperidine pentamethylene dithiocarbonate, used as an accelerator in the vulcanization of rubber

p p m Abbreviation for parts per million Cf *e p m*

Pr (1) Symbol for praseodymium (2) Abbreviation for propyl Pr^{α}, n-Pr—alphapropyl (normal propyl) Pr^{β}, i-Pr—betapropyl (isopropyl)

Prager-Jacobson classification The system of grouping organic compounds in 4877 divisions, employed in Beilstein's Handbuch

pragmoline Acetylcholine bromide

Prandtl number An expression of the temperature distribution in a fluid It equals the specific heat at constant pressure × kinematic viscosity/thermal conductivity (Cf *Reynolds number*)

prase (1) Greenish (2) A gray-green chalcedony

praseodymia The earth corresponding with the element praseodymium

praseodymium Pr = 140 92 A rare earth metal, atomic number 59 A greenish-yellow, metallic element, d 6 48, m 940, slowly decomp in water It was separated in 1885 by Auer von Welsbach from the earth didymia, and it occurs in cerite and other rare earth minerals The principal valency is three, and its salts are generally green in color **p acetate** $Pr(C_2H_3O_2)_3 3H_2O$ = 372 04 Green needles, very soluble in water **p chloride** $PrCl_3$ = 247 3 Green needles, d 4 017, m 818, slightly soluble in water **p oxalate** $Pr_2(C_2O_4)_3 10H_2O$ = 726 00 Light green crystals, insoluble in water **p oxides** (1) Pr_2O_3 = 329 8 Praseodymium trioxide A yellowish-green amorphous powder, d 7 07 (2) Pr_2O_4 = 345 8 Praseodymium tetroxide A black powder, d 5 98 (3) Pr_2O_5 = 361 8 Praseodymium peroxide **p peroxide** P oxide (3) **p phosphate** $PrPO_4$ = 235 9 A green powder, used as green coloring in ceramics **p sulfate** $Pr_2(SO_4)_3$ = 570 0 and $Pr_2(SO_4)_3 8H_2O$ = 714 2 A green crystalline powder, soluble in water **p sulfide** Pr_2S_3 = 378 0 A brown amorphous powder, d 5 402, decomp by heat, insoluble in water

praseolite A green alteration-product of iolite

Prechtl, Johann, Joseph Ritter von 1778–1854 An Austrian technologist and chemist, noted as author of a technical encyclopedia Cf *Pregl*

precious Valuable, rare **p garnet** Almandite **p metals** The noble metals, gold, platinum and silver **p opal** An opal exhibiting a play of delicate colors **p stone** A mineral used as a gem

precipitable Describing a soluble ion that can be made insoluble by the presence in solution of some other ion

precipitant A substance or reagent which, when added to a solution, causes the formation of an insoluble substance **group-** A reagent that will precipitate several related substances, as, H_2S or NH_4OH (See *qualitative analysis*)

precipitate (1) To cause a substance to become insoluble, and settle from a solution (2) The deposit of an insoluble substance from a solution after the addition of a precipitating reagent, as a result of a chemical reaction Cf *policeman, schwellenwert* **banded-** Periodic precipitation **black-** Mercurous oxide **group-** The sediment formed after the addition of a group precipitant it may consist of a number of substances having related properties (See *qualitative analysis*) **periodic-** See *periodic precipitate* **red-** Red *mercuric oxide* **white-** Ammoniated *mercury*, NH_2HgCl **yellow-** Yellow *mercuric oxide*

precipitated Settled out, caused to become insoluble **p bone** A by-product in the manufacture of glue from bones, consisting chiefly of dicalcium phosphate **p chalk** Calcium carbonate produced by precipitation **p phosphate** Dicalcium phosphate obtained from phosphate rock or processed bone **p vapor** The settlement of solid particles from gases or vapors on the walls of a container (see *rhythmic deposition*)

precipitation The process of making certain soluble substances (ions or salts) insoluble by the addition of a reagent, evaporation, freezing, or electrolysis **co-** The simultaneous settling out of more than one compound, as in gravimetric analysis, the contamination of calcium oxalate with magnesium oxalate **electrostatic-** The use of an electric potential to cause the settlement of the charged moisture globules which constitute a fog, or the dust particles which constitute a smoke (see *Lodge-Cottrell process*) **fractional-** The separation of substances by precipitating them in increasing order of solubility **group-** Making a series of substances of similar properties insoluble, by the addition of a single reagent, usually in excess

precipitin An immunizing substance formed in the blood-serum of animals or humans, that is capable of precipitating the bacteria whose cultures have been employed in the immunizing treatment See *Ehrlich's side-chain theory*

precipitinogen A substance which, on injection into animals or humans, will cause the formation of precipitins

precipitum The deposit of bacteria formed by the action of precipitins

precision instrument An accurately-graduated glass or other measuring instrument, certified by the manufacturer, but not tested at a government bureau They differ from certified instruments See also *standardized* buret, flask, pipet and thermometer

precursor (1) A substance synthesized in the dark by an organism, and differing from a photoproduct in that it is decomposed by light (2) A substance that forms the raw material for the synthesis of protoplasm in the living animal body (3) A substance which precedes the formation of another compound, cf *provitamin*

prefixes Syllables placed before a name to indicate certain atoms, structures or properties **order of-** In branched hydrocarbons the p may be arranged either alphabetically or according to complexity The former is the more usual

Pregl, Fritz 1868–1930 An Austrian chemist, noted for his development of quantitative microanalysis and spot tests Nobel prize winner in 1923

pregnane $C_{21}H_{36}$ = 288 2 A tetracyclic hydrocarbon and cholane derivative, q v **p diol** $C_{21}H_{36}O_2$ = 320 2 A sterol, m 233, from urine of pregnant women **p dione** $C_{21}H_{32}O_2$ = 316 2 A ketone derivative of p diol

pregnanolone $C_{21}H_{34}O_2$ = 318 2 A corpus luteum hormone Cf *cholane derivatives*

pregnene $C_{21}H_{34}$ = 286 2 $\Delta^{5\ 6}$-pregnane A cholane derivative, q v **p diol** $C_{21}H_{32}O_2$ = 316 2 A corpus luteum hormone

pregrattite A variety of muscovite from Pregratten, Tyrol

prehnite A hydrous silicate of calcium and aluminum, $H_2Ca_2Al_2(SiO_4)_3$

prehnitene $C_{10}H_{14}$ = 134 2 Prenitol, 1 2 3 4-tetramethylbenzene * An isomer of durene A colorless liquid, d 0 901, m −4, b 204, insoluble in water

prehnitic acid $C_{10}H_6O_8$ = 254 05 1 2 3 4-benzene tetracarboxylic acid * Colorless crystals, decomp 237 Cf *mellophanic acid*

prehnitilic acid *2 3 4*-Trimethyl benzoic acid *

preignition See *knock*

premier alloy A heat-resisting alloy of 61 % Ni, 25 % Fe, 11 % Cr and 3 % Mn

premier jus The edible oils obtained by rendering the tissues surrounding the kidneys of the cow

prenitic acid Prehnitic acid

prenitol Prehnitene

preparation (1) A chemical process for the production of a chemical compound (2) A chemical compound (3) The treatment of ores, as, ore concentration or ore dressing (4) A pharmaceutical product or mixture of drugs **p dish** A glass dish with glass cover, used as a receptacle for microscope slides or cover glasses **p jar** A large glass jar with glass cover, used as a receptacle for museum specimens **p of salts** See *salts*

prescription A written direction for compounding or administering a drug **p balance.** A delicate scale used in the weighing of small quantities, but less sensitive than an analytical balance

preservative A substance that prevents decay and decomposition of organic liquids or foods They include sulfites, fluorides, benzoates, salicylates, borates and formaldehyde, but their use is limited or prohibited in many countries **histological-** P used for biological specimens, as, Bouin's, Carl's, Flemming's, Kahle's and Zenker's solution **wood-** P used for lumber, as, creosote, tar, aczol

press A device which applies pressure **cork-** A corrugated wheel rotating in a corrugated elliptical frame, used for softening corks by pressure **filter-** See *filter* **plant-** A device which consists essentially of a piston in a perforated cylinder, used to express the juices from vegetable materials

pressing paper A coarse filter paper, used for drying specimens

presspahn Wall-boards, made by hydraulic pressure from wood pulp

pressure Strain or stress produced by the meeting of opposite forces, such as, pushing, thrust or compression **atmospheric-** The weight of the atmosphere, the pressure exerted by the gaseous envelope on the earth surface It is measured in atmospheres 1 atm = 14 7 pounds per in ^{2} = 1,012,630 dynes per cm ^{2} = 760 mm column of mercury **critical-** The pressure required to condense a gas at the critical temperature **disruptive-** See *disruption* **electrical-** Electromotive force **fugitive-** The variations at atmospheric pressure in the vicinity of explosions **high-** A p above one atmosphere **low-** A p below one atmosphere **negative-** A pressure that is less than one atmosphere, *i e*, a suction **normal-** One atmosphere = 760 mm Hg **osmotic-** See *osmosis* **partial-** The pressure exerted by a single gaseous constituent in a gas mixture (See *Dalton's Law*) **radiation-** See *radiation* **solution-** The molecular force of a solid that tends to go into solution, hence, a measure of the attractive forces (coordinate bonds) between the molecules of solute and solvent **standard-** See *normal-* **total-** The sum of the partial pressures of the constituents of a gas mixture

p blower Any device used to produce an air blast or current of air **p bottle** A heavy-walled glass container **p filter** (1) A filtering device, which consists of a porous porcelain cylinder through which the solution to be filtered is pumped (2) A filterpress **p gauge** A device for measuring the pressure of gases or liquids They include, principally, mechanical instruments (coiled tubes or diaphragms) or hydrostatic devices (mercury columns) Cf *manometer* **p tubing** Thick-walled rubber tubing used for vacuum pumps

prest-o-lite A commercial brand of acetylene gas, compressed in small cylinders

prestone Ethylene glycol

preventol A chlorinated phenol, used as a preservative for adhesives

prezymogen The cell substance of a living cell, that forms the zymogens

pribramite (1) A variety of sphalerite from Pribram, Bohemia (2) A variety of gothite

priceite A mineral, $3CaO,4BO_3,6H_2O$

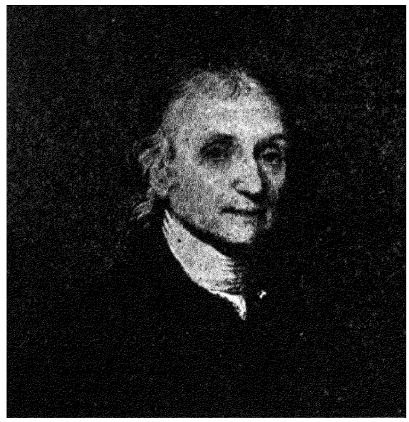
prickly ash bark Xanthoxylum

prickly ash berries Xanthoxyli fructus The dried fruits of *Xanthoxylum* species, a Rutaceae, used as a carminative and alterative

prickly-pear Opuntia, Indian fig The edible dried fruit of a cactus species (*Opuntia*), used as a source of alcohol for motor fuel

Priest photometer. An optical device for grading the colors of oils.

Priestley, Joseph. 1733–1804. An English-born American chemist, noted for his discovery of oxygen, gas experiments, and writings.



Joseph Priestley.

prill. Small particles of metal found in assay work.

primary. The first or simplest form. **p. alcohol.** An organic compound characterized by the $-CH_2OH$ group. **p. amine.** An organic compound characterized by the $-CH_2NH_2$ group. **p. battery.** A combination of substances constituting a voltaic cell, that produces a potential by the chemical changes undergone by its constituents. **p. carbon atom.** A carbon atom at the end of a carbon-carbon chain; or a carbon atom attached to one other carbon atom only. **p. color.** One of a number of simple colors, combinations of which are supposed to produce all the other possible shades of color (see *Helmholtz's theory*). **p. current.** The inducing current of an induction coil, q.v. **p. nucleus.** An organic cyclic compound which has only hydrogen atoms attached to the ring. **p. oxide.** A hypothetical unstable oxide formed during an oxidation reaction, and having the characteristics of a peroxide which loses oxygen. See *induced reactions*. **p. reaction.** The principal or fastest reaction in a composite system of reactions. **p. valence.** See principal *valence*.

prime. A proposed name for the positive nucleus.

primer. (1) Detonator, percussion cap. (2) An explosive cartridge containing the detonator.

primeverose. $C_{11}H_{20}O_{10} = 312.15$. A disaccharide, hydrolysing to glucose and xylose, from the glucosides of cowslips and primrose.

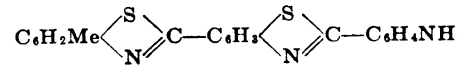
primeverosidase. An enzyme which hydrolyzes primrose glucoside to primeverose.

priming. (1) The escape into the condenser as a result of splashing, bumping etc. of a liquid being distilled. The distillate is thus contaminated with it. (2) P. sugar. **p. powder.** Fulminating powder. **p. sugar.** A sugar added to a finished beerto- impart body or briskness as a result of after fermentation. Glucose or invert sugar is used. **p. tube.** Primer.

primula. Cowslip. The dried herb of *Primula officinalis*, a Primulaceae.

primulaverin. A glucoside from the root of primula. Cf. *primverin*.

primulin. (1) A crystalline substance from the root of *Primula officinalis*. (2) A primrose-colored azo dye, which consists of the alkali salts of primulin bases. **p. bases.** A group of sulfur dyes obtained by heating p-toluidine and sulfur with amines. They contain the ring structure:



primulite. A crystalline sugar from the roots of *Primula officinalis* and identical with volemitol.

primverase. An enzyme from the root of *Primula officinalis*.

primverin. A glucoside from the root of *Primula grandiflora*. Cf. *primulaverin*.

Prince Rupert drops. Pear-shaped droplets of glass, obtained by allowing molten glass to fall into water. On breaking off the tip, they shatter explosively into a fine powder.

Prince's metal. A brass consisting of zinc (25 %) and copper (75 %).

principal. The main or chief function, leading or first; as, p. quantum number, p. valence. Cf. *principle*. **p. axis.** (1) The optical axis of a crystal. (2) The longest axis of a crystal. **p. series.** A type of spectrum in which the lines are related by:

$$\frac{1}{\lambda} = n = N\left[\frac{1}{(1+S)^2} - \frac{1}{(m+P)^2}\right],$$

and which generally contains the strongest lines. See *Rydberg equation, sharp and diffuse series, Bohr's atom*. **p. valence.** That valence of an element in which it has the largest number of stable compounds.

principle. (1) A theory or assumption; a fundamental concept; as, the p. of Chatelier, p. of Pauli, p. of valency. Cf. *principal*. (2) A substance on which the characteristic effect of a vegetable drug or mixture depends. **acid-** The organic acids of a vegetable drug. **active-** The substance on which the physiological effect of a drug depends, as *e.g.*, alkaloids, glucosides, tannins. **basic-** Alkaloid. **bitter-** Amaroids. **neutral-** A glucoside, salt, ester, or essential oil. **odorous-** Essential oil. **proximate-** Active p. **resinous-** Resin. **sweet-** Glucoside. **toxic-** The poisonous constituent of a drug.

printer's ink. See *ink*.

printer's liquor. A solution of ferrous acetate.

printing. The mechanical reproduction of reading matter or designs. See *letterpress, lithography, gravure*.

prism. (1) A crystal or solid figure whose faces are parallelograms parallel to the axis, and whose ends are triangular or polygonal faces parallel and similar to one another. They may belong either to the tetragonal, hexagonal, orthorhombic, monoclinic, or triclinic systems. (2) A triangular glass rod or hollow glass vessel, used to produce a spectrum. **Nicol-** Two similar triangular pieces of Iceland spar cemented together to form a prism. It splits a ray of light into two portions, polarized and reflected, and is used in polariscopes to obtain polarized light. **spectrum-** A polished triangular glass rod used in spectroscopes.

prismatic. Formed or shaped like a prism. **p. colors.** Rainbow colors. The monochromatic tints produced by the unequal refraction of the constituent rays of light when passing through a prism. See *spectrum*.

pristane $C_{18}H_{38}$ = 254 3 Iso-octadecane A hydrocarbon from the liver oil of sharks

pro- A prefix derived from the Greek and indicating "before" or "in preference to"

proagglutinoid An agglutinoid that has greater attraction for the agglutinogen than the agglutinin

probability A mathematical treatment of a series of numbers or observations, to find the limits of error or the degree of approximation to the truth Let M be the total number of cases in a series, m, the number of cases in one group, and n, the number of cases in another group, then n + m = M and $\frac{m}{M}\ \frac{n}{M}$ is the proportion of the parts to the whole The probability is $\frac{m}{M} + 2\sqrt{\frac{2mn}{M_3}}$ or $\frac{m}{M} - 2\sqrt{\frac{2mn}{M^3}}$ This means that if in 100 observed cases (M), there were 25 cases (m) of one type, and 75 (n) cases of the other type, then in any other series of similar experiments there may be observed as many as $\frac{25}{100} + 2\sqrt{\frac{2 \times 25 \times 75}{100^3}} = 0\ 25 + 0\ 1225 = 0\ 3735$, hence 37 *cases of m* (as MAXIMUM), and as few as $\frac{25}{100} - 2\sqrt{\frac{2 \times 25 \times 75}{100^3}} = 0\ 25 - 0\ 1225 = 0\ 1275$, that is 13 *cases of m*, (as MINIMUM) Correspondingly, there will be from 63 to 87 cases of n

procaine $C_{13}H_{20}O_2N_2 HCl$ = 272 7 Novocaine, p-aminobenzoyl-diethylaminoethanol hydrochloride, ethocaine kerocaine, syncaine, neocaine, $NH_2 C_6H_4 COOCH_2CH_2 NEt_2 HCl$ Colorless, odorless crystals m 154, soluble in water or alcohol, used medicinally as a local anesthetic Cf *percaine* **p base** $C_{13}H_{20}N_2O_2$ = 236 7 Novocaine base, β-diethylaminoethyl-*p*-amino-benzoate, *p*-aminobenzoxy-diethylamino ethane A white granular powder, m 61, insoluble in water, soluble in alcohol, ether or benzene **p hydrochloride** Procaine **p nitrate** Colorless crystals, m 100, soluble in water

procellose $C_{18}H_{32}O_{16}$ = 504 25 A trisaccharide from cellulose, m 210, hydrolyzed to three glucose molecules

process A method used in the manufacture or treatment of substances **type-** The principal operations involved in a chemical plant, as, conditioning, energizing and reacting **unit-** (1) A chemical operation carried out on a non-laboratory scale (2) The successive individual operations necessary for the production of a definite compound, as, crushing, grinding, separating, leaching, dissolving, concentrating, evaporating, distilling, mixing *E g*,

TRANSPORTING of solids—rail, cable, conveyors, elevators, chutes
of liquids—pipes, ditches, canals, flumes
of gases —pipes, flues, chutes
SEPARATING solids from solids—Screens, graders, jigs, concentration tables, flotators, magnetic separators
solids from liquids—Filters, driers, centrifuges, settlers, classifiers, presses, thickeners
solids from gases—Dust chambers, filter bags, precipitators
liquids from liquids—Thickeners, centrifuges, stills
liquids from gases—Separators, condensers
gases from gases—Diffusers, compressors, stills
CONDITIONING—Crushers, grinders, mixers, kneaders, digesters, sprayers, compressors, gasifiers, driers
ENERGIZING—Power plant (water, coal, gas, oil, electricity) Heating equipment Cooling equipment Electrical equipment
REACTING—Vats, Tanks, Retorts, Stills, Roasters, Towers, Furnaces, Chambers

p tankage A fertilizer made from nitrogenous waste material by the action of acid or alkali and pressure Cf *nitrogenous tankage*

prochlorite A mineral containing pennine and chlorite

prodag A semi-colloidal suspension of graphite in water, used as a mould wash in metal casting and in rubber curing Cf *aquadag*

prodorite An acid-resisting concrete which contains pitch

producer An apparatus for the manufacture of illuminating and fuel gas, by passing air over red-hot coke **p gas** A combustible gas, a mixture of nitrogen, carbon monoxide, and small quantities of CO_2, H_2, and CH_4 obtained by passing steam and air over coal at 1000°C

product The substance manufactured **reaction-** Reactant The compound formed by a reaction **substitution-** A derivative, q v **split-** A decomposition product

proenzyme The substance of the living cell that produces the enzymes

proferment The substance of the living cell that produces the ferments (see *zymogen*)

profile paper Coordinate paper

proflavine $C_{13}H_{11}N_3SO_4$ = 307 1 3 6-diaminoacridine sulfate A reddish-brown crystalline powder, soluble (with fluorescence) in water or alcohol, used as an antiseptic and for sleeping sickness

progesterone $C_{21}H_{30}O_2$ = 314 2 Progestin, luteosterone C, luteal hormone A hormone from corpus luteum, white crystals, occurring in two isomeric forms *alpha-* m 128 *beta-* m 121, They produce progestational changes in the uterus For structure see *cholane*

progestin α- and β-Progesterone, secreted by the corpus luteum, injected intramuscularly for disorders of pregnancy and menstruation

progression Series Any series of related increasing or decreasing numbers *E g*, arithmetic- (1 2 3 4), geometric- (1 2 4 8), harmonic ($\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{4}$) progressions (q v)

progynon German for theelin

proidonite The mineral, SiF_4

projection nucleus See *nucleus*

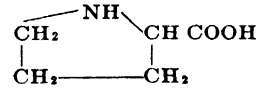
pro-knock A substance which induces knocking in an internal combustion engine Antonym anti-knock, q v

prolactin A hormone from the anterior pituitary, which causes mammary glands of mammals and crop glands of pigeons to secrete milk

prolamine A group of proteins from cereals, soluble in dilute alcohol, insoluble in water or absolute alcohol **p from oats** Contains cystidine and histidine **p from sorghum** Contains no tryptophane

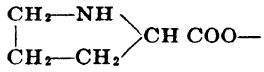
prolan A hormone from the anterior pituitary gland

proline $C_5H_9O_2N$ = 115 1 Alpha- or 2-pyrrolidine carboxylic acid



An amino-acid and protein split-product, which does not react with nitrous acid or ninhydrin

prolyl The monovalent radical,



derived from proline

promin The soluble didextrose sulfonate of 4′ 4 diaminodiphenyl sulfone A drug which is stated to be active against the tubercle bacillus in guinea pigs

promoter (1) Catalyst accelerator A substance which, when added to a catalyst will hasten its effect on a reaction (opposed to catalyst poison) (2) In flotation see *collector*

proof spirit A dilute alcohol, d 0 91984 at 60°F , which consists of 49 24 % by weight of absolute alcohol in distilled water **over-proof-** A spirit which is x over-proof contains in 100 volumes (100 − x) volumes of proof spirit **under-proof-** x under-proof means that 100 volumes of the spirit mixed with sufficient water will yield 125 volumes of proof spirit

propadiene* C_3H_4 = 40 0 Allene, dimethylene methane A dialkene or diolefine containing two double bonds, $H_2C{=}C{=}CH_2$ **dioxo-** Carbon suboxide

propaesin, propæsin $C_{10}H_{13}O_2N$ = 179 11 Propesin, propyl-p-aminobenzoate, p-amidobenzoic acid propylester, $NH_2C_6H_4COOC_3H_7$ A white crystalline powder, m 76, slightly soluble in water, soluble in alcohol or ether, used medicinally as a sedative

propalanine Aminobutyric acid

propaldehyde Propion aldehyde

propanal* Propion-aldehyde Cf *propenal, proponal* **2 2-dimethyl-*** Pivaldehyde **2-methyl-*** Isobutyraldehyde

propanamide* Propionamide **2-hydroxy-*** Lactamide

propane* C_3H_8 = 44 1 The third member of the methane series A colorless gas, $d_{(air=1)}$ 1 558, m −195, b −39, slightly soluble in water, soluble in alcohol or ether **acetyl-** Propylmethylketone **bromo-*** Propyl bromide, **chloro-*** Propyl chloride **diamino- P diamine*** **dihydroxy-*** Propanediol **epoxy-*** Propylene oxide **hydroxy-** Propanol **imino-** Propylenimine **iodo-*** Propyl iodide **methoxy-*** Methylpropyl ether **nitronitroso-** Propyl pseudonitrol **phenyl-** Cumene **trichloro-*** Trichlorohydrin **trihydroxy-** Glycerol **p carboxylic acid** Butyric acid **p diamide*** Malonamide **p diamine*** $C_3H_{10}N_2$ = 74 09 Trimethylenediamine, propylene diamine, $NH_2(CH_2)_3NH_2$ A ptomaine from beef-broth cultures of coma bacillus A colorless liquid, b 135 5, used as reagent for mercury **p dicarboxylic acid** Glutaric acid **p dinitrile*** Malononitrile **p dioic acid*** Malonic acid **p tricarboxylic acid.** Tricarballylic acid

propanediol* $C_3H_8O_2$ = 76 1 Dihydroxypropane **1 2-** or α- Propyleneglycol, $MeCHOH\text{-}CH_2OH$ A colorless liquid, d 1 051, b 188 **1 3-** or β- Trimethyleneglycol, $CH_2OH\,CH_2\text{-}CH_2OH$ A liquid, d 1 053, b 215, soluble in water, alcohol or ether **3-chloro-*** α-Chlorohydrin

propanedione* 1 2-Pyruvaldehyde

propanetriol* Glycerol

propanoic acid* Propionic acid

propanol* C_3H_8O = 60 1 **normal-** 1-Propyl alcohol $CH_3\,CH_2\,CH_2OH$ A colorless liquid, d 0 799, b 97, soluble in water **iso-** or 2-propyl alcohol $CH_3\,CHOH\,CH_3$ A colorless liquid, d 0 780, b 82, soluble in water, alcohol or ether **chloro-*** Propylene chlorhydrin **diethoxy-*** See *diethylglycerol, diethyline* **diiodo-*** Iothion **epoxy-*** Glycidol **methyl-** Butyl alcohol **phenyl-** Phenetyl alcohol **trichloromethyl-** Chloretone

propanolon acid $C_3H_4O_4$ = 104 1 Oxypyroracemic acid A hydroxyketo acid, $CH_2OH\text{-}CO\,COOH$

propanone* Acetone **dihydroxy-** Dihydroxyacetone **diphenyl-** Benzylketone **hydroxy-** Acetol

propargyl The monovalent radical, $HC{\equiv}C\text{-}CH_2$—, derived from propargyl alcohol **bi-** or **di-** Bipropargyl

propargylacetate $C_5H_6O_2$ = 98 1 The propargyl ester of acetic acid, $MeCOOC_3H_3$ A colorless liquid, d 1 005, b 124, soluble in alcohol or ether

propargylalcohol C_3H_4O = 56 1 Propinol The unsaturated alcohol, $CH\,C\,CH_2OH$ A colorless liquid, d 0 972, b 114, soluble in water, alcohol or ether

propargylic acid Propiolic acid

propasin Piopaesin

propenal Acrolein Cf *propanal, proponal*

propene* C_3H_6 = 42 1 **1,2-** or $\Delta^{1(2)}$- Propylene **1,3-** or $\Delta^{1(3)}$- Cyclopropane **bromo-*** Allyl bromide **chloro-*** Allyl chloride **dichloro-*** Allylene dichloride **p dicarboxylic acid** Glutaconic acid **p oxide** Propylene oxide **p thiol*** Allyl mercaptan **p tricarboxylic acid** Aconitic acid

propenol Allyl alcohol **phenyl-** Cinnamic alcohol

propenyl (1) The monovalent group $CH_3\text{-}CH\,CH$—, derived from propylene (2) Glyceryl **p benzene** Allyl benzene **p hydrate** Glycerol **p phenol** Anol **p trinitrate** Nitroglycerin

propenylidene The bivalent radical, $CH_3\text{-}CH\,C{=}$, derived from propylene

propeptone Hemialbumose

properties The characteristics of a substance **additive-** (1) P which depend on the quantity of matter, as, mass, volume, heat capacity (2) P of a molecule which can be calculated from constituent atoms, as, molecular weight Cf *constitutive-* **atomic-** P which depend on a characteristic of the atom, as, spectrum lines Cf *molecular-, molar-* **chemical-** The chemical behavior of a substance, as, its reactions Cf *physical-* **constitutive-** (1) P which depend upon the quality of matter, as, melting point, atomic weight (2) P which cannot be calculated from constituent atomic types, but which are due to constitution, as, optical rotatory power Cf *additive-* **electric-** The electrical phenomena exhibited by a substance **extensive-** P depending on quantity, as, inertia, momentum, electric capacity, heat capacity Cf *intensive-* **general-** P which are inherent in all matter, as, elasticity, gravity, capacity for energy Cf *special-* **intensive-** P depending on quality, as, crystalline form,

solubility, atomic weight, boiling point Cf *extensive-* **magnetic-** The magnetic phenomena exhibited by a substance **mechanical-** The general physical properties of a substance, as, density, weight, hardness, strength **molal-** P depending upon the amount of substance, as, m boiling point elevation and m freezing point depression **molar-** P depending on size, form, or weight of a substance, as, mechanical p Cf *atomic-, molecular-* **molecular-** P depending on molecules, as, isomerism, physiological effect Cf *atomic-, molar-* **physical-** Physical phenomena (q v) shown by a substance, which remains unchanged so long as there is no change in molecular composition, *e g* , mechanical, thermal, electrical, magnetical and radiant properties **radiant-** The light and color characteristics of a substance **special-** P exhibited to varying extents by some matter, but not by all matter, as color, transparency, hardness, solubility, acidity Cf *general-* **thermal-** The phenomena of a substance due to absorption or liberation of heat, such as, melting and freezing, boiling and condensing

prophetin $C_{20}H_{36}O_7$ = 388 4 A glucoside from *Ecballium officinale* and *Cucumis prophetarum*, Cucurbitaceae, slightly soluble in water, soluble in alcohol or ether

prophoretin $C_{20}H_{30}O_4$ An amorphous, resin-like split-product of prophetin

prophylactic Anything that prevents or contributes to the prevention of disease, a preventive

prophylaxis Preventive treatment

propilidene Propylidene

propine Allylene **p dicarboxylic acid** Glutinic acid

propinol Propargyl alcohol

propinyl The monovalent radical, $—C_3H_3$

propiolaldehyde C_3H_2O = 54 0 Propynal* An unsaturated aldehyde, CH C CHO An oily liquid, b 61

propiolic acid $C_3H_2O_2$ = 70 0 Carboxy-acetylene, propargylic acid, acetylene carboxylic acid, propynoic acid*, CH C COOH A colorless liquid, m 6, b 144, soluble in water, alcohol or ether **methyl-** Tetrolic acid **phenyl-** Ph C C COOH Colorless crystals, m 136, soluble in water or alcohol

p acid series See *acetylene acids* **p alcohol** C_3H_4O = 56 05 *2*-Propyn-*1*-ol A liquid, CH C CH_2OH, $d_{21°}$ 0 963, m −17, b 114 Soluble in water

propiolyl The monovalent radical, HC C CO—, derived from propiolic acid

propion (1) Propione (2) Propionyl **p aldoxime** C_3H_7ON = 73 1 Propionic aldoxime, EtCH NOH Colorless crystals, d 0 926, m 21, b 131 **p amide** C_3H_7ON = 73 1 Propionic amide, propionyl amine, propanamide*, $EtCONH_2$ Colorless leaflets, d 1 0335, m 79, b 213, soluble in water, alcohol or ether **p anilide** $C_9H_{11}ON$ = 149 1 Propionyl aniline EtCONHPh Colorless leaflets, m 104, slightly soluble in water soluble in alcohol or ether

propionaldehyde C_3H_6O = 58 1 Propanal*, propaldehyde, propyl aldehyde, propionic aldehyde The saturated aldehyde, $MeCH_2CHO$ A colorless liquid, d 0 807, m −81, b 48, soluble in water, alcohol, or ether **dihydroxy-** Glyceraldehyde **dimethyl-** Pivaldehyde

propionamide Propion

propionate (1) A salt of propionic acid of the general type C_2H_5COOM (2) An ester of the general type C_2H_5COOR

propione $C_5H_{10}O$ = 86 1 Propion, *3*-pentanone*, diethylketone EtCOEt A colorless liquid, b 101, soluble in water, alcohol or ether, used medicinally as a hypnotic

propionic acid $C_3H_6O_2$ = 74 1 Carboxy-ethane, propanoic acid*, pseudacetic acid The saturated fatty acid, $MeCH_2COOH$ A colorless liquid, d 0 987, m −20, b 141, slightly soluble in water, soluble in alcohol or ether, **acetyl-** Levulinic acid **amino-** Alanine **aminohydroxy-** Serine **aminohydroxyphenyl-** Tyrosine **aminoindyl-** Tryptophane **benzoyl-** Benzoyl propionic acid **carbamyl-** Succinamic acid **dihydroxy-** Glyceric acid **dimethyl-** Pivalic acid **dioxyphenyl-** Hydrocaffeic acid **epoxy-*** Glycidic acid **hydroxy-** (1) Lactic acid (2) Hydracrylic acid **keto-** Pyruvic acid **phenol-** Hydrocoumaric acid **phenyl-** (1) Hydratropic acid (2) Hydrocinnamic acid

p aldehyde Propionaldehyde **p anhydride** $C_6H_{10}O_3$ = 130 11 Propionyl oxide, propanoic anhydride* $(MeCH_2CO)_2O$ A colorless liquid, d 1 017, b 168, decomp by water or alcohol

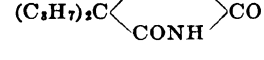
propionitrile Ethylcyanide

propiono Propionyl

propionyl Propiono The monovalent radical, $MeCH_2CO—$, derived from propionic acid **p chloride** C_3H_5OCl = 92 52 Propanoyl chloride* A liquid, C_2H_5COCl, $d_{20°}$ 1 065, b 80 **p phenetidine** Triphenin **p salicylic acid** $C_{10}H_{10}O_4$ = 194 1 $C_6H_4(O—OC\,CH_2Me)COOH$ White shining scales, m 95, insoluble in water, soluble in alcohol or ether, used medicinally as an antirheumatic

propiophenone $C_9H_{10}O$ = 134 1 $MeCH_2COPh$ **β-phenyl-** $C_{14}H_{12}O$ = 196 09 Phenylbenzyl-ketone, α-benzylacetophenone, $PhCH_2COPh$ A colorless solid, m 60 b 322 used in organic synthesis

proponal $C_{10}H_{16}O_3N_2$ = 212 2 Di-*iso*-propyl-barbituric acid



Colorless crystals, m 145, slightly soluble in water, soluble in dilute alkali, alcohol or ether, used medicinally as a hypnotic Cf *propanol*

proportion A ratio, a numerical comparison of a part to the whole **definite-** Proust's law, law of definite proportions The same compound always consists of the same elements combined together in the same proportions by weight, hence, in any one compound the percentage of its constituents is unalterably fixed **equivalent-** Compounds of the elements A and C must be formed according to the scheme m atoms A, n atoms C Compounds of the elements B and C must be composed of x atoms B, y atoms C Compounds of the elements A and B must contain p atoms A, q atoms B But x, y, m, n, p, q, are whole numbers, usually small Hence p, q, are either the same as m, x, or whole multiples of them, usually small **multiple-** Law of multiple proportions If two elements combine in more than one p , the molecules of one compound must be formed by adding a whole number of atoms of one or

both elements to one or more molecules of the other compound

p limit The least proportion of a substance which can be detected in another specified substance

propoxy The monovalent radical, $MeCH_2$-CH_2O—, derived from propanol

propyl Pr or C_3H_7— The monovalent radical, $MeCH_2CH_2$—, derived from propane Alpha-propyl (Pr^{α}), normal propyl, (n-Pr) *iso-* The monovalent radical, Me_2CH—, derived from isopropane Beta-propyl (Pr^{β}) Isomeric propyl, (i-Pr)

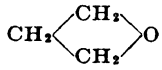
p acetate $C_5H_{10}O_2$ = 102 1 The propyl ester of acetic acid, MeCOOPr A colorless liquid, d 0 891, b 102, slightly soluble in water, soluble in alcohol or ether **p acetylene** C_5H_8 = 68 1 The unsaturated alkaline or acetylene hydrocarbon, PrC CH A colorless liquid, b 48, insoluble in water, soluble in alcohol or ether **p alcohol** Propanol * **p aldehyde** Propionic aldehyde **p amine** C_3H_9N = 59 1 *normal-* Aminopropane, propaneamine* $PrNH_2$ A colorless, refractive liquid, d 0 719, b 49, soluble in water, used medicinally as a sedative *iso-* A liquid, soluble in water, Me_2CHNH_2, b 32 **p amine hydrochloride** $PrNH_2 HCl$ = 95 6 Colorless deliquescent crystals, soluble in water, used medicinally **p amine sulfate** $(PrNH_2)_2$-H_2SO_4 = 216 2 Colorless crystals, soluble in water, used in medicine **p aniline** $C_9H_{13}N$ = 135 2 The secondary amine PhNHPr A colorless liquid, d 0 949, b 222, soluble in alcohol or water **p benzene** C_9H_{12} = 120 14 The aromatic hydrocarbon, PhPr, phenylpropane A colorless liquid, d 0 862, b 158, insoluble in water, soluble in alcohol or ether **p benzoate** $C_{10}H_{12}O_2$ = 164 2 The propyl ester of benzoic acid, PhCOOPr A colorless liquid, d 1 032 b 229, sparingly soluble in water, soluble in alcohol or ether **p benzoic acid** $C_{10}H_{12}O_2$ = 164 2 $C_6H_4PrCOOH$ *ortho-* Colorless leaflets m 58, b 272, soluble in water, alcohol or ether *para-* Colorless crystals, b 140, slightly soluble in water, soluble in alcohol or ether **p bromide** C_3H_7Br = 123 0 Bromopropane* A colorless liquid, d 1 364, b 71, slightly soluble in water, soluble in alcohol **p butyrate** $C_7H_{14}O_2$ = 130 2 The propylester of butyric acid, PrCOOPr A colorless liquid, d 0 879, b 143, soluble in alcohol or ether **p carbamate** $C_4H_9O_2N$ = 103 1 The propylester of carbamic acid, NH_2COOPr Colorless prisms, m 53, b 194, very soluble in water, alcohol or ether **p carbinol** *1*-Butanol* **p carbylamine** iso-Me_2CHNC = 69 09 A liquid, b 87 **p chloride** C_3H_7Cl = 78 53 *normal-* $MeCH_2$-CH_2Cl 1-chloropropane* A colorless liquid, d 0 895, b 46, slightly soluble in water, soluble in alcohol or ether *iso-* MeCHClMe 2-chloropropane, secondary, or propyl-2-chloride A colorless liquid, d 0 859, b 37, slightly soluble in water, soluble in alcohol or ether **p cyanide** C_4H_7N = 69 1 *normal-*Butyronitrile PrCN A colorless liquid, d 0 794, b 118, soluble in water, alcohol or ether *iso-* Me_2CHCN = 69 1 A liquid, b 107 **p ether** $C_2H_{14}O$ = 102 1 Propyloxide, propoxypropane* Pr_2O A colorless liquid, d 0 744, b 90 7, soluble in water, alcohol or ether **iso-** Isopropyl oxide A colorless liquid, d_{15}°0 7247, m −60, b 67 5, insoluble in water, soluble in all other liquids, used as solvent for gums, waxes, and asphalt **p formate** $C_4H_8O_2$ = 88 1 The propyl ester of formic acid, HCOOPr A colorless liquid, d 0 901, b 81, slightly soluble in water, soluble in alcohol or ether **p hydroxylamine** C_3H_9-ON = 75 1 *β-* PrNHOH *α-* $PrONH_2$ **p iodide** C_3H_7I = 170 0 1-iodopropane*, PrI A colorless liquid, d 1 748, b 102, sparingly soluble in water, soluble in alcohol or ether, used in organic synthesis **p isocyanide** *normal-* PrNC *iso-* Me_2CHNC **p ketone** Butyrone **p mercaptan** C_3H_8S = 76 1 Hydrosulfopropane, propyl hydrosulfide, PrSH A colorless liquid, b 67, slightly soluble in water, soluble in alcohol or ether **p nitramine** $C_3H_8O_2N_2$ = 104 1 $PrNHNO_2$ A colorless liquid, d 1 103, m −21, b 130, slightly soluble in water, soluble in alcohol or ether **p nitrate** $C_3H_7NO_3$ = 105 1 A colorless liquid, d 1 063, b 119, soluble in alcohol or ether **p nitrite** $C_3H_7NO_2$ = 89 1 A colorless liquid d 0 935, b 57, soluble in alcohol or ether **p nitrolic acid** $C_3H_6O_3N_2$ = 118 08 The solid, $MeCH_2C(NO_2)NOH$, m 74, soluble in water, alcohol ether **p phenyl ketone** Butyrophenone **p pseudonitrol** $C_3H_6N_2O_3$ = 118 0 Nitronitrosopropane $Me_2C(NO)NO_2$ **p pyridine** $C_3H_7C_5H_4N$ = 121 14 *alpha-* A liquid, b 166, *beta-* A liquid b 158 *gamma-* A liquid, b 177 **p sulfide** $(C_3H_7)_2S$ = 118 2 Propylthioether, *1*-propylthiopropane*, Pr_2S A colorless liquid, d 0 814, b 141, insoluble in water, soluble in alcohol or ether **p thiocyanate** (*iso-*) C_3H_7NCS = 101 15 P mustard oil A liquid b 137 **p thioether** See *p sulfide* **p urea** $C_4H_{10}ON_2$ = 102 1 $NH_2CONHPr$ A colorless crystalline powder, m 107, soluble in water

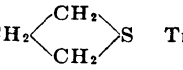
propylen The monovalent radical, CH_3CH-CH—, derived from propylene **p aldehyde** Acetonic aldehyde

propylene C_3H_6 = 42 1 (1) Propene* The unsaturated hydrocarbon, MeCH CH_2, a homolog of ethylene and isomer of cyclopropene A colorless gas, $d_{(au-1)}$ 1 498 b −37, soluble in water, alcohol or ether (2) The bivalent radical, —CHMe CH — Cf *propylidene* (3) The monovalent radical CH_2 CH CH— Cf *propylen*

p aldehyde Crotonaldehyde **p bromide** $C_3H_6Br_2$ = 201 89 1 *2*-Dibrompropane* A colorless liquid, d 1 931, b 131, slightly soluble in water, soluble in alcohol or ether **p chlorohydrin** C_3H_7ClO = 94 52 (1) Chloro*iso*propyl alcohol, *1*-chloro-*2*-propanol*, Me-CHOH CH_2Cl A colorless liquid, d 1 115, b 126 (2) *2*-Chloropropyl alcohol, Me-CHCl CH_2OH A colorless liquid, d 1 103 b 134 **p chloride** $C_3H_6Cl_2$ = 113 0 1 *2*-dichloropropane* A colorless liquid, d 1 166, b 97, slightly soluble in water, soluble in alcohol or ether, used alone or with carbon dioxide as an insecticidal fumigant for food-stuffs **p dichloride** P chloride **p diamine** Propane diamine* **p ether** C_3H_6O = 58 06 A liquid, b 35, soluble in water alcohol, or ether **p glycol** Propanediol **p oxide** C_3H_6O = 58 1 Propeneoxide **1 2-** Epoxypropane* The heterocyclic compound, $MeCH\text{—}CH_2$ (with O bridging the two carbons)

A colorless liquid, d 0 859, m 35, soluble in water, alcohol or ether **1 3-** Trimethyleneoxide The heterocyclic compound,



p sulfide C_3H_6S = 74 10 The heterocyclic compound,  Trimethylene sulfide

propylenimine C_3H_7N = 57 1 Iminopropane, $MeCH_2CH$ NH

propylidene Propilidene The divalent radical, $MeCH_2CH$=, derived from propane **p bromide** 1 1-Dibromopropane* **p chloride** 1 1-Dichloropropane*

propyloic- A prefix indicating the radical —CH_2 - CH_2 COOH on a side-chain Cf *methyloic*

propynal* Propiolaldehyde

propyne* Allylene **bromo-*** Propargyl bromide

propynoic acid* Propiolic acid

propynol* Propargyl alcohol

propyrin Pyrenol

propytal δ δ-Propylbarbituric acid

prorennin Rennase

pros- A prefix derived from the Greek, indicating "by," "near" or "at" **p position** The 2 3-position of the naphthalene ring

prosapogenin $C_{50}H_{80}O_{14}$ (?) A non-sugar hydrolytic product of saponin, decomp 208, and hydrolysing to endosapogenin and $C_6H_{10}O_7$

prosopite A native, hydrated calcium aluminum fluoride

prospecting Searching for or exploring new ore deposits

prostate A gland at the neck of the bladder in male animals **p powder** The dried and powdered glands of animals

prosthesis Replacement or substitution

prosthetic group (1) The group formed by a substance that is combined with a simple protein to form a complex protein, as, the chromophoric group in chromoproteins (2) The group formed by an organic radical not derived from an amino-acid, that enters into the complex molecule of a conjugated protein, q v

protactinium Pa = 230 Proto-actinium A radioactive disintegration-product between uranium and actinium and an isotope of eka-tantalum, atomic number 91 It is the genetic link between the uranium and actinium series, and was discovered in 1918 by Hahn and Meitner It has a half-life value of 32,000 years

protagon $C_{160}H_{305}O_{35}N_5P$ A crystalline substance obtained from red blood corpuscles and brain matter Cf *pseudocerebrin*

protamin A group of simple proteins occurring in the sex cells of fishes, such as, salmine and sturine Cf *protein*

protamine $C_{16}H_{32}O_2N_9$ = 382 35 An amine isolated from spermatozoa and fish spawn

protan A compound of casein and tannic acid A brown powder, insoluble in water, used as an intestinal astringent

protargol A compound of silver and albumin, a bulky, light brown powder (8 3 % Ag), soluble in water or glycerin, used as a bactericide

protargyl Protyle

proteacin Leucodrin

protean A group of derived proteins, q v

protease A proteolytic enzyme that splits proteins to proteoses and peptones **gastric-** Pepsin **pancreatic-** Erepsin Trypsin **vegetable-** Bromelin Papain

protective colloid A substance that forms a covering envelope for colloidal particles, and stabilizes them towards the coagulating effects of electrolytes Cf *cone*

proteid An obsolete term for protein

proteidin An immunizing substance developed in the organism from complex proteins and bacteriolytic enzymes which dissolves bacteria

protein One of a group of nitrogenous organic compounds of high molecular weight that ranges between 34,000 and 200 000, (generally multiples of 16–17,000), and which occur in vegetable and animal matter They yield several aminoacids on hydrolysis and are formed by the activity of plants They serve as food for animal and man, and are assimilated in the form of aminoacids and reconstructed in the protoplasm Cf *polypeptide, isoelectric point, proteinate, protein salt*

MOLECULAR WEIGHTS OF PROTEINS

	From chemical data	Osmotic pressure	Ultra centrifuge
casein	12,800	33,600	98,000
edestin	29,000	49,500	212,000
hemoglobin	16 660	34,300	67,000
egg albumin	33,800	36,000	34,000
serum albumin	78,000	73 000	75,000

alcohol-soluble- Prolamines Gliadins **bacterial-** A toxic protein formed by bacteria **coagulated-** A simple protein that has been so altered by heat or chemical agents as to become insoluble **compound-** Conjugated protein **conjugated-** A group of complex proteins consisting of a protein-molecule and a non-protein molecule **defensive-** A protein formed in an organism as a protection against bacterial invasion (See *alexin, immunity*) **derived-** A decomposition product of proteins that is intermediate in complexity of structure between proteins and amino-acids **synthetic-** See *polypeptide*

CLASSIFICATION OF PROTEINS

[A] (Adopted by the American Physiological Society and the American Society of Biological Chemists)

I SIMPLE PROTEINS —Substances that yield only α-aminoacids or their derivatives on hydrolysis

a albumins—Soluble in water or dilute salt solution, and coagulable by heat

ovalbumin	from egg white
serum albumin	from blood serum
lactalbumin	from milk
vegetable albumin	from plant tissues

b globulins—Insoluble in water, soluble in salt solutions, and coagulated by heat

ovoglobulin	from eggs
serum globulin	from blood serum
edestin	from hemp seed
amandin	from fruit kernels

c glutelins—Insoluble in neutral solvents, soluble in dilute acids or bases, and coagulated by heat

glutenin	from wheat

d prolamines (or gliadins)—Soluble in 80 % alcohol, insoluble in water, absolute alcohol, or neutral solvents

zein	from corn
gliadin	from wheat
hordein	from rye
bynin	from malt

e albuminoids—Insoluble in all neutral solvents

elastin	from ligament
collagen	from tendon
keratin	from horn and hoofs

f histones—Soluble in water, or dilute acids, precipitated by or insoluble in ammonia, not coagulated by heat

globin	from hemoglobin
scombrone	from mackerel sperm
thymus histone	from thymus gland

g protamines—Soluble in water, uncoagulable by heat Simplest proteins or polypeptides

salmine	from salmon sperm
sturine	from sturgeon sperm
clupeine	from herring sperm

II CONJUGATED PROTEINS —Substances that consist of protein combined with some other substance (the prosthetic group or molecule)

a nucleoproteins—Compounds of one or more proteins with a nucleic acid

cytoglobulins	from cytoplasm
nucleohistones	from cell nuclei

b glycoproteins—Compounds of protein with carbohydrates

mucins	from mucus
osseomucoids	from bones
tendomucoids	from tendon
ichthulins	from carp eggs
helicoproteins	from snails

c phosphoproteins—Compounds of proteins with a phosphorus compound other than lecithin or nucleic acids

caseins	from milk
ovivitellins	from egg yolk

d chromoproteins (hemoglobins)—Compounds of proteins with a chromophoric group (Cf *pigments*)

hemoglobins	from mammalian blood
hemocyanins	from invertebrate blood
chlorophylls	from green plants

e lecithoproteins—Compounds of proteins with lecithins

f lipoproteins—Compounds of proteins with fatty acids

III DERIVED PROTEINS—Primary and secondary split-products of proteins

a proteans—Insoluble products due to the action of water or enzymes

myosan	from myosin
edestan	from edestin

b metaproteins—Products resulting from the action of acids or bases

c coagulated proteins—Resulting from the action of heat or alcohol on proteins

d proteoses—Products resulting from further hydrolysis They are soluble in water, and not coagulated by heat, and are precipitated by saturating their solutions with ammonium or zinc sulfate

e peptones—Soluble in water, non-coagulable by heat, not precipitated by saturating their solutions with ammonium sulfate

f peptides—A compound of two or more amino-acids possessing one or more —CO NH— or peptide groups

[B] (Adopted by the chemical and physiological societies of England)

I Simple proteins
1 protamins (same as American I g)
2 histones (same as I f)
3 albumins (same as I a)
4 globulins (same as I b)
5 glutelins (same as I c)
6 alcohol-soluble proteins (same as I d)
7 scleroproteins (same as I e)
8 phosphoproteins (same as II C)

II Conjugated proteins
1 glucoproteins (same as II b)
2 nucleoproteins (same as II a)
3 chromoproteins (same as II d)

III Hydrolysis products
1 infraproteins (same as III b)
2 proteoses (same as III d)
3 peptones (same as III e)
4 polypeptides (same as III f)

proteinase An enzyme that hydrolyses proteins **acid-** Pepsin **alkali-** Trypsin

proteinate A compound formed from a protein and a base, Prot COOM, as, sodium caseinate Cf *isoelectric point, protein-salt*

protein-salt A compound of a protein with an acid, $X\,NH_2Prot$, as, casein hydrochloride Cf *proteinate*

proteoclastic Proteolytic Protein-splitting, or hydrolyzing proteins

proteolysis The conversion of proteins into soluble peptones by decomposition or hydrolysis of the protein molecule

proteolytic Proteoclastic

proteose A group of derived proteins, q v

protheite A variety of pyroxene

protiodide An iodide which contains the minimum amount of iodine, an *-ous* compound, cf *biniodide*

protista The lowest and most primitive forms of life, which consist of single-cell organisms, part plant, part animal in nature

protistology A branch of science that deals with unicellular organisms

protium The hydrogen isotope of mass 1 0, as compared with deuterium and tritium

proto- A prefix derived from the Greek, indicating "first" **p salt** An obsolete term for a compound that contains the smallest amount of the negative radicals or atoms of the same positive element, as, HgI, mercurous iodide or mercury protiodide, and HgI_2, mercuric iodide or mercury biniodide

protoactinium Protactinium

protobastite A variety of enstatite

protobitumen A partially-reduced carbohydrate, which on further reduction yields oil, as, algarose (synthetic) and algarite (natural) It is formed by the oxidation of mineral oil

protocatechol (1) Catechol (2) Pyrocatechol

protocatechualdehyde $C_7H_6O_3$ = 138 1 3 4-Dihydroxybenzaldehyde, dihydroxybenzenecarbonal,* protocatechoic aldehyde $C_6H_3(OH)_2CHO$ Colorless leaflets, m 153, slightly soluble in water, soluble in alcohol or ether **methyl-** Vanillin **methylene-** Piperonylic acid

protocatechuic acid $C_7H_6O_4$ = 154 03 3 4 Dihydroxybenzoic acid $C_6H_3(OH)_2COOH$ Colorless crystals, d 1 542, decomp 199, soluble in water, alcohol or ether, used as a developer in

photography It occurs in the oil of shepherd's-purse **p alcohol** Protocatechuyl alcohol **p aldehyde** Protocatechualdehyde

protocatechuyl alcohol $C_7H_8O_3$ = 140 06 Protocatechuic alcohol, 3 4-dihydroxybenzylalcohol, $C_6H_3(OH)_2\,CH_2OH$ **methylaminomethyl-** Adrenalin

protochloride An obsolete term to indicate the compound containing less chlorine than the normal chloride of the same element

protocotoin $C_{16}H_{14}O_6$ = 302 2 A principle from paracoto bark Cf *cotein*

protocurarine An alkaloid derived from curare

protofluorine A hypothetical element of atomic weight 2 1, assumed to exist in certain nebulae, and placed between hydrogen and helium in the periodic table Cf *coronium, nebulium*

protohydrogen A hypothetical element, assumed to exist in certain bright stars and nebulae, and to have an atomic weight of 0 081, *i e*, less than that of hydrogen

proton Prouton, uron (1) Originally the positive nucleus, q v, of an atom (Rutherford, Bohr) (2) The nucleus of the hydrogen atom, *e g*, the hydrogen-ion, H^+ (3) A particle of mass one and one positive charge, considered to be a "building stone" of atomic nuclei, thus, a *proton* and *electron* in immediate contact make a *neutron*, if at a distance equal to that of the electron radius, a *photon*

p acceptor A substance which gains a hydrogen ion, as, a base **p bombardment** The transmutation caused by fast-moving protons

$$C^{12} + H^1 \rightarrow (N^{13})^* \xrightarrow{\gamma} N^{13}$$
10 min

$$B^{11} + H^1 \rightarrow (C^{12})^* \xrightarrow{\gamma} C^{12}$$
10^{-18} sec

where an excited isotope is formed which yields γ-rays Cf *radioelements, radioactivity* **p donor** A substance yielding a hydrogen ion, as an acid **p number** The whole-numbered isotopic weight, which may be assumed to be the number of hydrogen nuclei or protons and neutrons Cf *atomic structure* **p reaction** (1) Neutralization Cf *prototropy* (2) Nuclear reactions

protones A group of hydrolyzed products of protamines

protophile A weak base which unites with a proton Cf *acid* (3)

protophilia Hydrophilia The tendency of a molecule to unite with hydrogen-ions (protons) See *hydrogenium ions*

protophyllin A colorless substance, chlorophyll hydride, that changes to green chlorophyll by the action of carbon dioxide

protophyta A single-celled plant, such as, the bacteria, yeasts, and single-celled algae Cf *diatoms, protozoon*

protopine $C_{20}H_{19}O_5N$ = 353 2 Macleyine, fumarine An alkaloid obtained from opium, chelidonium, and corydalis species Colorless crystals, m 207

protoplasm Protoplasma bioplasm A viscid colloidal material, the physical basis of all life, q v, it consists, in the living condition, of a dynamic system of proteins, fats, and carbohydrates, reacting with each other It forms a jelly-like material with water as the continuous phase, in which various structural elements can be observed under the microscope a network (spongioplasm) and in the more fluid portion (hyaloplasm), a nucleus with nucleoplasm, chromatin, and linin (see *cell, micelle, zone*)

P is assumed to be alive as long as its balance of internal reactions within and between the structural elements is maintained Any outside matter that tends to react with the atomic group (side chains, as, $—NH_2$ or —COOH of proteins, —CHO or $—CH_2OH$ of carbohydrates, etc) will disturb the equilibrium of reactions, the p is now less reactive, and becomes paraplasm and finally, dead matter

protoplasma Protoplasm

protoporphyrin A constituent of hemoglobin and of the brown pigment of egg-shells It occurs widely, but in small quantities in nature, and has been synthesized It contains a nucleus of four pyrrole rings Cf *phylloporphyrin*

protosal $C_{11}H_{12}O_6$ = 240 1 Glycerin salicylic formic ester, $CH_2—OOC\,C_6H_4OH$ $CH—OOC\,H$ CH_2OH A colorless oily liquid, d 1 344, insoluble in water, soluble in alcohol or ether Used medicinally as an antirheumatic

protosulfate The sulfate of a series of sulfates that contains the smallest amount of SO_4 radical

prototropic Pertaining to reactions which are influenced by H^+ or protons

prototropy Pseudoacidity, mobile H-tautomerism, mobile proton tautomerism A case of ionotropy (q v) in which a detached H atom causes a molecule to exist as tautomeric ions Cf *anionotropy, e g*,

$$Ph\,CH_2\,N\langle^{O}_{O} \underset{(rapid)}{\rightleftharpoons} Ph\,CH\,NO_2^- + H^+$$

phenylnitromethane *pseudo-molecule* — *pseudo-anion* ⇅ *(slow)*

$$Ph\,CH\,N\langle^{OH}_{O} \underset{(rapid)}{\rightleftharpoons} Ph\,CH\,NO\,O^- + H^+$$

phenyl-isonitromethane *aci-molecule* — *aci-anion*

prototype An original type or model, as the international *meter*

protoveratrine $C_{32}H_{51}O_{11}N$ = 625 5 An alkaloid, m 247, from the rhizome of *Veratrum album*, a Liliaceae, it is physiologically more active than veratrine

protoxide That oxide of a metal forming several oxides which contains the least number of atoms of oxygen

protozoon, plural **protozoa** Any unicellular animal, or the lowest class of the animal kingdom, as, ameba, infusoria, and paramecia Cf *protophyta*

protractor An instrument for measuring angles

protuberance A projecting part **solar-** The giant streamers of incandescent gases on the sun's surface Cf *coronium, corona*

protyl Propargyl The monovalent radical, $—CH_2\,C\,CH$

protyle Archyl, protargyl, pantogen, or urstoff The hypothetical substance from which all chemical elements are derived Cf *hydrogen*

Proust, Louis Joseph 1755–1826 A French chemist, noted for the law of definite propor-

tions **P 's law** The law of constant proportions q v

proustite Ag_3AsS_3 Ruby silver A native silver sulfarsenite, hexagonal ruby-red crystals

Prout, William 1785–1850 An English physician, noted for his hypothesis **P hypothesis** (1815) All elements are multiples of a protyle or of hydrogen (See *atomic structure*) This speculative view of over a century ago has attained importance by a more recent ratification of the theory, based on (a) natural disintegration, as shown by radioactive elements yielding helium, and (b) artificial disintegration, as by the yields of hydrogen and other products on electron bombardment Cf *radioelements*

prouton A suggested name for proton

provitamin A precursor to a vitamin *E g*, p A Carotene p D Sterols (*e g*, ergosterol, epiergosterol, dihydrocholesterol) which are converted into vitamin D (q v) by exposure to ultra-violet or cathode rays Cf *β-carotene*

proximate The ultimate or nearest approach **p analysis** Quantitative analysis (q v), rationally interpreted (Cf *water* analysis) **p principle** The active principle of a drug, as an alkaloid or glucoside

prozane Triazane(2)

prulaurasin $C_{14}H_{17}NO_6$ = 295 19 A racemic mandelonitrile glucoside, m 122, from cherry laurel, *Prunus leurocerasus*

prunasin $C_{14}H_{17}NO_6$ = 295 19 A *d*-mandelonitrile glucoside, m 147, from *Prunus padus*

prune Prunus The partly dried fruit of *Prunus domestica*, a Rosaceae, used as a food, and medicinally, as a mild laxative

prunetol Genistein

prunol Ursolic acid

prunus Prune **p amygdalus** Almond **p domestica.** Prune **p spinosa** Blackthorn **p. virginiana** Wild cherry

prussian blue A group of complex salts formed by oxidation of the white precipitate obtained from a solution of ferrous sulfate and potassium ferrocyanide Used as dyes in inks and cotton printing, and for paper, but now largely superseded by aniline dyes **insoluble-** Turnbull's blue **native-** Vivianite **α-soluble-** True prussian blue, alpha-potassium ferric ferrocyanide, $4FeK[Fe(CN)_6]\,7H_2O$ A deep blue powder, giving a blue colloidal solution with water **β-soluble-** beta-potassium ferric ferrocyanide $FeK[Fe(CN)_6]\,H_2O$ **x-soluble-** A more stable variety of the β-form Cf *milori blue*

prussian red Colcothar

prussiate (1) Cyanide (2) Ferrocyanide (3) Ferricyanide **red-** Potassium ferricyanide **yellow-** Potassium ferrocyanide

prussic acid Hydrocyanic acid

prussine Cyanogen

ps Abbreviation for pseudo

ψ (1) The Greek letter "psi" (2) Abbreviation for pseudo

pseud-, pseudo-, *ps-*, or ψ- A prefix derived from the Greek indicating "false" or "similar to" This prefix was proposed by Baeyer to designate substances derived from a hypothetical parent-substance or a tautomeric form

pseudacetic acid Propionic acid

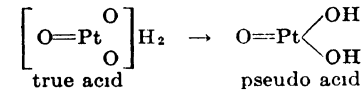
pseudaconine $C_{27}H_{41}O_9N$ = 523 4 A decomposition product of pseudaconitine

pseudaconitine $C_{36}H_{51}O_{12}N$ = 689 4 Acetylveratryl-ψ-aconine, ψ-aconitine A crystalline alkaloid, m 211, derived from *Aconitum ferox*

pseudoacid (1) An organic compound which has acidic properties and forms salts, but which does not contain the carboxyl radical, —COOH The acid character of ψ-acids is due to a —OH group attached to a nitrogen atom, as in the iso-nitroso compounds

$$\underset{\text{nitro-}}{R\,CH_2NO_2} \rightarrow \underset{\text{isonitroso}}{R\,CHN(O)OH} \rightarrow \underset{\text{isonitroso ion}}{R\,CHN(O)O^- + H^+}$$

(2) The hydroxy form of an acid, as



true acid pseudo acid

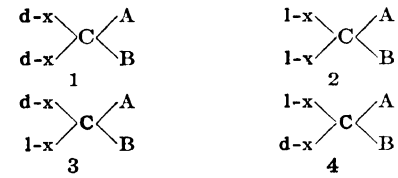
Cf *prototropy*

pseudoaconitine Pseudaconitine

pseudoallyl Isopropenyl

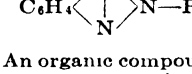
pseudoalum A group of double sulfates of aluminum and a divalent metal, $MAl_2(SO_4)_4 \cdot 24H_2O$, in which M may be manganese, ferrous, magnesium, zinc or copper Cf true *alum*, $M_2Al_2(SO_4)_4\,24H\,O$, where M is a monovalent metal

pseudoasymmetry A form of optical isomerism in which a non-asymmetric carbon atom becomes asymmetric owing to the presence of d- and l-asymmetric groups, as,



where (*d*-X) and (*l*-X) represent a similar optically-active dextro- and levo-radical, as, —CH-(OH)COOH In 1 and 2 the central carbon atom is not asymmetric, as the optical rotations of the two radicals are alike, in 3 and 4 the carbon atom is pseudo-asymmetric, for the two radicals have different rotations

pseudoazimides Indodiazoles, q v A group of organic compounds of the type,



pseudobase An organic compound that normally has no basic properties, but becomes basic in presence of acids, (cf *amphoteric*)

pseudobrookite The vitreous mineral $2Fe_2O_3\,3TiO_3$

pseudobutylene *2*-Butene*

pseudocellulose Hemicellulose

pseudocerebrin $C_{44}H_{90}O_8N$ = 762 9 A compound formed by hydrolysis of protagon by alkali

pseudocholestene $C_{27}H_{46}$ = 370 4 The hydrocarbon corresponding with allocholesterol Cf *cholane derivatives*

pseudocodein $C_{18}H_{21}O_3N$ = 299 2 An alkaloid resembling codein

pseudoconhydrine See *conhydrine*

pseudocumene C_9H_{12} = 120 14 Cumol, *as-* or 1 2 4-trimethylbenzene, $C_6H_3Me_3$ A colorless liquid, d 0 879, m −57, b 170, insoluble in water **hexahydro-** See *hexahydro cumene*

pseudocumidine $C_9H_{13}N$ = 135 2 2 4 5-trimethylaniline, $C_6H_2(NH_2)Me_3$ 1-amino-2 4 5-

trimethylbenzene Colorless needles, m 66, b 234, soluble in water

pseudocumyl A monovalent radical, $Me_3C_6H_2$—, derived from pseudocumene, as, **a-** or 2, 3, 5-, **s-** or 2, 4, 5-, and **v-** or 2, 3, 6-

pseudocurarine A non-poisonous alkaloid found in *Nerium oleander*, an Apocynaceae

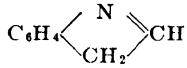
pseudocyanate A compound having the —ONC radical Cf *fulminate*

pseudocyanic acid The acid HONC Cf *fulmic acid, pseudoisocyanic acid*

pseudodichroism Pseudopolychroism

pseudogalena Sphalerite

pseudoindole C_8H_7N = 117 1 Indolenine, 1-isobenzazole The heterocyclic compound,



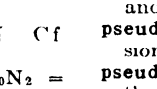
pseudoindoxyl See *indoxyl*

pseudoindyl A group of seven isomeric, monovalent, radicals, C_8H_6N—, derived from pseudoindole

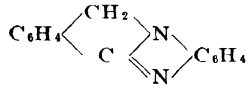
pseudoisatin Isatin

pseudoisocyanic acid The acid, HOCN Cf *pseudocyanic acid*

pseudoisoindole C_8H_7N = 117 11 Isoindolenine, 2-isobenzazole



Cf *pseudoindole* **p benzimidazole** $C_{14}H_{10}N_2$ = 316 1 Benzylenebenzimidazole The heterocyclic compound,



pseudoisomerism Isomerism between two molecules containing the same number and same kind of atoms, but having different linkages between the atoms due to a different valency of one of them, as, cyanide and isocyanide See *isomerism*

pseudoisotope A radioactive element resembling an isotope in its reactions, but having a different atomic number

pseudomalachite See *malachite*

pseudomerism Dynamic isomerism in which a molecule reacts, under given conditions, according to one structure, and under different conditions according to an isomeric structure

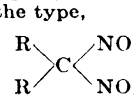
pseudomonotropy A form of allotropy in which the transition temperature from one allotropic form to the other is below the melting point of the substance

pseudomorph A crystal that appears in general outline to belong to one system, but actually consists of an aggregate of minute crystals which belong to another crystal system

pseudomorphy A phenomenon exhibited by some crystals of appearing outwardly of one system, but possessing a different structure internally **chemical-** Pseudomorphism caused by chemical substitution or alteration **physical-** Pseudomorphism caused by a change in allotropic form

pseudonarcissine An alkaloid from the bulbs of *Narcissus pseudonarcissus*, an Amaryllidaceae

pseudonitrol A group of organic nitro-nitroso compounds of the type,

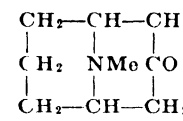


as, propylpseudonitrol or nitro-nitrosopropane, $Me_2C(NO)NO_2$

pseudonitrosite A group of organic nitro-nitroso compounds in which the two radicals are attached to different carbon atoms, —C(NO)—C(NO_2)— Cf *nitrols*

pseudonuclein Nucleoalbumin

pseudopelletierine $C_9H_{15}NO\ 2H_2O$ = 189 16 N-methyl granatanine,



An alkaloid from the root-bark of the pomegranate Prismatic plates, m 48, b 246, soluble in water or alcohol Cf *pelletierine*

pseudophenanthroline $\alpha\beta$-Naphthisodiazine

pseudophysostigmine $C_{15}H_{21}O_3N_2$ = 277 19 An alkaloid from calinuts or false calabar beans A white crystalline powder, soluble in alcohol or ether

pseudopolychroism See *polychromatic*

pseudoracemе A crystal of an organic compound composed of equal mixtures of the dextro- and levo-compounds

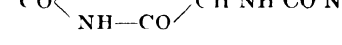
pseudosolution A colloidal suspension or emulsion

pseudotannin A group of tannin split-products that have lost the capacity to convert hide into leather

pseudotropine See *tropine*

pseudourea CH_4N_2O = 60 1 Isourea NH_2-C(NH)OH

pseudouric acid $C_5H_6N_4O_4$ = 186 1 5-Carbamidobarbituric acid



pseudoxanthine (1) An isomer of xanthine, q v (2) A leukomaine from muscle tissue resembling xanthine in its properties but not in its composition

pseudozoogloea A clump of living bacteria that resembles a primitive animal, protozoon, under the microscope

psi- The Greek letter ψ, Ψ A symbol for (1) pseudo-, (2) specific function, or the electric field in Schrodinger's atom, (3) lbs per sq in

psicaine $C_{21}H_{27}NO_{10}$ = 453 23 d-ψ-cocaine bitartrate $(COOH\ CHOH)_2NMe\ C_7H_{10}(COOMe)O\ COPh$ White crystals, soluble in water, used as a local anesthetic

psilomelane A hydrated pyrolusite, or native manganic hydroxide, $Mn(OH)_3$

psoraline Caffeine

PSP Phenolsulfonephthalein

psychotrine $C_{28}H_{36}O_4N_2$ = 464 4 An alkaloid in ipecac

psychrometer See *hygrometer* **sling-** A whirling hygrometer (q v) in a metal frame with a leather strap

psychrometric chart A chart on which the temperature of drying is plotted against the weight of water-vapor removed per unit weight of dry air It gives the weights of water-vapor required to saturate unit weight of dry air to various extents at various temperatures

psylla alcohol Psyllic alcohol **p wax** A solid wax obtained from the leaf louse, *Psylla alni*

psyllic acid $C_{33}H_{65}COOH$ = 492 51 Psyllostearylic acid A fatty acid, m 95, from psylla wax Cf *lacceroic acid* **p alcohol** $C_{33}H_{67}OH$ = 480 53 Psyllostearyl alcohol A solid, m 69 5, from psylla and bees-wax

psyllostearyl alcohol Psyllic alcohol

psyllostearylic acid. Psyllic acid

pt Abbreviation for (1) pint, (2) part

Pteridophyta A main division of Cryptogamia, which includes Filices (ferns), Equisetaceae (horsetails) and Lycopodiaceae (club mosses)

pterin A yellow purine-type pigment from mammalian tissues Cf *rhodopterin*

pterocarpine An alkaloid from red sandalwood, *Pterocarpus santalinus*, a Leguminosae

ptomaine Animal alkaloid, cadaveric or putrefactive alkaloid A group of amino compounds which result from the decomposition of proteins or dead animal matter by microorganisms *E g*,

Name	*Occurrence*
aminovaleric acid	putrefying fibrin and meat
amylamine	codliver oil, putrid yeast
anthracine	anthrax bacillus
aselline	codliver oil
betaine	mussel, human urine
butylamine	codliver oil
cadaverine	putrefying animal tissues and bacterial cultures
cancerine	pathological urine
caproylamine	putrid yeast
choline	decomposing animal tissues and bacterial cultures
collidine	putrid pancreas
diethylamine	putrefying fish
dihydrolutidine	codliver oil
eczemine	
ethylamine	putrefying yeast, wheat flour
ethylidendiamine	putrefying fish (haddock)
gadinine	putrefying fish (haddock)
hexylamine	putrid yeast
hydrocollidine	putrefying fish and animal tissues
hydrocoridine	agar culture of bacterium album
kreotoxine	meat
methylamine	putrefying fish
methylguanidine	putrefying horse flesh
morrhuic acid	codliver oil
morrhuine	codliver oil
muscarine	decomposing haddock
mydaleine	putrefying human organs
mydatoxine	putrefying human organs
mydine	putrid human tissues
mydilotoxine	poisonous mussel
neuridine	putrefying flesh
neurine	putrefied flesh
parvoline	putrefying mackerel and horse flesh
peptotoxine	decomposing proteins
phlogosine	cultures of staphylococcus
propylamine	cultures of human feces
putrescine	putrefying fish
pyocyanine	cultures of bacillus pyocyanus
saprine	putrefying liver and spleen
sepsine	decaying yeast
spasmotoxine	cultures of tetanus bacillus
susotoxine	cultures of hog-cholera bacillus
tetanine	cultures of tetanus bacillus
tetanotoxine	cultures of tetanus bacillus
triethylamine	putrefying fish
trimethylamine	herring-brine
trimethylenediamine	beef-broth cultures of comma bacillus
typhotoxine	cultures of Eberth's bacillus
tyrotoxicone	poisonous cheese, cream and milk

ptyalase Ptyalin, salivary amylase, salivin The enzyme of the saliva, that hydrolyzes starch to dextrin, maltose, and glucose, and sucrose to dextrose and levulose Cf *amylase, diastase* **p unit** The quantity of p that will digest 1 gm starch under standard conditions, as, 37°C , 30 minutes, pH 6 7, in presence of 0 05 % NaCl

ptyalin Ptyalase

puberonic acid Puberulonic acid

puberulic acid $C_8H_6O_6$ = 198 0 A metabolic product of molds, *e g*, *Penicillium puberulum* Almost colorless crystals, m 317 It is toxic to certain bacteria

puberulonic acid $C_8H_4O_6$ = 196 0 A metabolic product of molds, *e g*, *Penicillium puberulum* Bright yellow prisms, m 298 It has some of the properties of a pseudo-acid, and is toxic to certain bacteria

pucherite A native bismuth vanadate, $BiVO_4$

puddle, puddling (1) The conversion of cast iron into wrought iron by fusion in a reverberatory furnace, with constant stirring to bring it in to contact with the haematite lining of the furnace, where oxidation of the carbon to carbon monoxide takes place, the gas rising through the molten iron (2) Clay, moistened and well-worked

puering Bating The cleaning of depilated hides in the leather industry

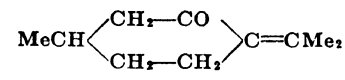
Pukall filter A hollow cylinder of porous unglazed clay, used to filter solutions or water and render them sterile from microorganisms Cf *Berkefeld filter*

pukateine $C_{17}H_{17}O_3N$ = 283 3 An aporphine alkaloid found in a New Zealand laurel, *Laurelia Novæ Zealandiæ* Cf *laureline, corytuberine*

pulegium The Labiatae *Hedeoma pulegoides* (American p) and *Menthae pulegium* (European p)

pulegol $C_{10}H_{18}O$ = 154 2 3-menthenol An aromatic alcohol contained in the essential oils of *Mentha pulegium*, a Labiatae

pulegone $C_{10}H_{16}O$ = 152 2 3-$\Delta^{4(8)}$-menthenone An aromatic ketone in oil of hedeoma



A colorless liquid, d 0 932, b 221, insoluble in water, miscible with alcohol or ether It

causes fatty infiltration of liver, heart and kidney

Pulfrich refractometer An optical device for measuring the refractive index, especially of oils and fats

pulmoform $C_{15}H_{16}O_4$ = 260 0 Methylene diguaiacol, $CH_2(C_6H_3OMe\ OH)_2$ A yellow tasteless powder, insoluble in water Used medicinally as an antiseptic

pulmones sicci The dried and powdered lungs of animals, used medicinally

pulp Any soft or semi-liquid mixture of solid particles and liquids, as, the finely-divided wood fibres suspended in water used for making paper See *paper pulp*

pulpwood The raw material for paper manufacture, generally the trunks of spruce, hemlock and balsam fir (cf *wood pulp*)

pulque The fermented sap of an *Agave* species, which is a moderately intoxicating drink, popular in Mexico Cf *mescal*

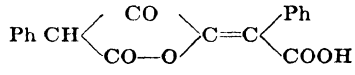
pulsatilla Pasque flower The dried herb of *Anemone pulsatilla* and other species, a ranunculaceous plant, used medicinally as the fluid extract, as an alterative and sedative

pulse The edible seeds of leguminous plants, as, peas

pulverization The reduction of a substance to a powder

pulverizing Powdering

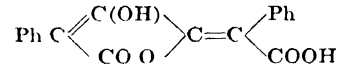
pulvic acid $C_{18}H_{12}O_5$ = 308 1 The monolactone of diphenylketipic acid



Colorless crystals, m 214 Cf *pulvinic acid*

pulvinate (1) Convex- or cushion-shaped, as a colony of bacteria (2) A salt of pulvinic acid

pulvinic acid $C_{18}H_{12}O_5$ = 308 1 2 3-dihydroxy-1 4-diphenylmuconic acid-γ-lactone,

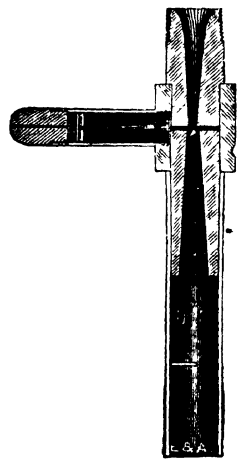


Cf *pulvic acid* **p p′-dihydroxy-** Atromentin

pulvis The Latin term for powder

pumice Pumice stone A light porous stone of volcanic origin, which consists of the silicates of aluminum, sodium, and potassium, used as an abrasive, and as a base for catalysts

pump A machine for drawing or forcing liquids or gases from one container into another **acid-** See *acid* **air-** See *air* **backing-** A low-power pump used to produce a partial vacuum in preparation for a high-power pump **filter-** A device attached to a water faucet at A, which is used to produce a partial vacuum or suction (through B) during filtration **Hickmann-** See *vacuum p* **mercury-** See *Sprengel p* **suction-** Filter p **Töpler-** A mercury pump, which removes air by entrainment between drops of mercury falling in a tube **vacuum-** See *vacuum*



Filter pump

pumpkin seed Pepo The dried ripe seeds of several varieties of *Cucurbita pepo* Used medicinally as the fluid extract as an anthelmintic, it contains a resin

punctiform A minute bacterial colony, near the limit of natural vision

pungent Sharp or biting, as a pungent odor or pungent taste

punicic acid $C_{18}H_{32}O_2$ = 280 27. An isomer of eleostearic acid, m 43 5, from the seed oil of *Punica granatum* (pomegranate) a Punicaceae

punicine (1) Pelletierine (2) A purple coloring matter obtained by oxidation of the colorless juices of shell-fish

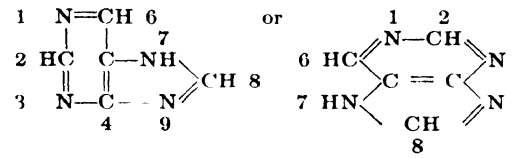
pure Free from contamination, as, **bacteriologically-** Contains no live bacteria **chemically-** Containing no other substance Cf *chemicals*

purgatin Purgatol

purgative An agent that causes the evacuation of the bowels, as, magnesium sulfate, castor oil

purgatol $C_{18}H_{12}O_7$ = 340 1 Purgatin, anthrapurpurin diacetate, $C_{14}H_5O_2(OH)(C_2H_3O_2)_2$ An orange, crystalline powder, m 177, insoluble in water, soluble in dilute alkalis Used medicinally as a purgative

purine $C_5H_4N_4$ = 120 1 The heterocyclic compound



Colorless monoclinic needles, m 212, soluble in water, alcohol, ether or toluene **endogenous-** q v **exogenous-** q v **p alkaloids** Purine bases **p bases** The alkaloids derived from purine, as theobromine, theophylline, caffeine, adenine **p bodies** A compound that contains the purine-ring, a compound derived from purine by the substitution of its hydrogen atoms, as,

6-oxypurine	hypoxanthine or sarcine
2,6-dioxypurine	xanthine
6-aminopurine	adenine
2-amino-6-oxypurine	guanine
2,6,8-trioxypurine	uric acid
3 7-dimethyl xanthine	theobromine

Many of these purine bodies are found as hydrolytic products of nucleoproteins, and they occur in animal waste-products **p dione** Xanthine **p ring** The heterocyclic arrangement of the atoms in the molecule of purine, q v **p skeleton** The p ring **p trione.** Uric acid

purinometer. A device for estimating the purine bodies in urine, a small buret with a glass stop-cock having a closed bore which forms a small compartment

purinone Hypoxanthine

Purkinje, Johannes Evangelista 1787–1850. A Hungarian physiologist noted for his studies or color **P effect** Optical sensation in-

creases with increasing intensity of light more rapidly for the red than for the other spectral colors **P shift** The shift in the maximum of the luminosity curve of the spectrum visible to the light-adapted human eye, as compared with the dark-adapted eye

purone $C_5H_8O_2N_4$ = 156 1 2 8-Dioxy-1 4 5 6-tetrahydropurine A reduction-product of uric acid produced by electrolysis

purple (1) A mixed color comprising red and blue rays, with an excess of red (2) A red coloring matter of the purple snail **visual-** The photosensitive material of the retinal rods of the eye It sensitises the eye to dim light, and contains vitamin A Cf *rhodopsin* **p carmine** Murexide **p of cassius** A red colored substance obtained by adding alkali to a mixture of solutions of stannous, stannic and gold chlorides, a colloidal form of tin oxide with adsorbed gold Used in the manufacture of ruby glass and red enamels for porcelains **p copper** Bornite

purpureo Describing a group of metal ammines of tetra-, tri- or bivalent metals with NH_3-molecules and negative radicals, as, (a) $[Co(NH_3)_5X]X_2$ (b) $[Co(NH_3)_4X_2]X$, X is a halogen or other negative radical, as NO_3 Group, (a), is termed chloro-pentammine, (b), chloro-tetrammine, as $[Co(NH_3)_5Cl]Cl_2$—chloropentammine cobaltichloride (purpureo cobaltichloride), or $[Co(NH_3)_4Cl_2]Cl$—chlorotetrammine cobaltichloride There are also double salts, as, $[Co_2(NH_3)_{10}Cl_2](NO_3)_4$—chloropentammine cobaltinitrate

purpuric acid $C_8H_4N_5O_6$ = 266 2 An oxidation-product of uric acid related to alloxantin Cf *murexide*

purpurin $C_{14}H_8O_5$ = 256 1 Trihydrooxyanthraquinone, oxyalizarin 6, 1 2 4-trihydroxy-5 10-dioxyanthracene A red coloring matter, obtained from the glucoside of madder or synthetically Red needles, m 256, decomp by further heat, soluble in water, alcohol or ether **anthra-** See *anthrapurpurin* **flavo-** See *flavopurpurin*

purpuroxanthene Xanthopurpurin

purpuroxanthic acid $C_{15}H_8O_6$ A substance in madder

purree *Indian* yellow

purreic acid (1) $C_{19}H_{16}O_{10}\,3H_2O$ = 458 2 A monobasic acid from Indian yellow Small, light yellow crystals of first sweet, later bitter, taste, slightly soluble in water, soluble in alcohol or ether (2) Euxanthic acid

purrenone Euxanthone

purrone Euxanthone

pus A liquid product of inflammation of infected wounds, which consists of leukocytes with microorganisms and serum **blue-** A blue pus produced by the *Bacillus pyocyaneus* Cf *cyopin, pyocyanin*

pustulant An agent that produces pustules or small inflammations of the skin, as, croton oil Cf *vesicant*

putrefaction The progressive chemical decomposition of organic matter, especially proteins, produced generally by anaerobic bacteria See *decay*

putrefactive alkaloids Ptomaines

putrescence Partial or complete rottenness or putrefaction

putrescent Having an offensive and stupefying odor, as, a material that is undergoing putrefaction

putrescine $C_4H_{12}N_2$ = 88 1 Tetramethylene diamine, butylenediamine, 1 4-butanediamine* $NH_2CH_2\,CH_2\,CH_2\,CH_2NH_2$ A ptomaine which results from the decay of animal tissue and the action of certain bacteria, a colorless ill-smelling liquid

putrid Rotten or putrefactive

putrine $C_{16}H_{21}N_2O_3$ = 234 2 A base in putrid pancreas

putty A mixture of 11 parts chalk and 3 parts of raw linseed oil with or without 5 parts of basic lead carbonate, used for setting glass and filling holes and cracks **iron-** See *iron* **p powder** A powder made by heating tin in air, removing the dross, and igniting the product of the action of nitric acid on the residue, used as a polishing powder, and in white enamel and opal glass

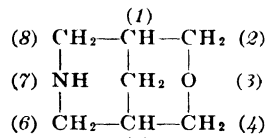
puzzolane A silicate-rich but lime-poor cement which occurs native in Puzzuoli (Italy) It was used by the Romans Cf *pozzolana*

P V A Abbreviation for polyvinyl alcohol plastics

Py An abbreviation for the pyridine ring

pycnometer Pyknometer

pydine $C_7H_{13}NO$ = 127 1 A bicyclic compound consisting of a combined piperidine and pyrane ring



pyelography A branch of radiography in which certain organs (as, kidney) are made opaque to x-rays by previous administration of a suitable compound, as iopax

pyknometer A small graduated glass vessel of definite volume with a glass stopcock, with or without a thermometer, used to weigh a definite volume of liquid in order to determine its specific gravity W/V = D, where W = weight, V = volume and D = density or specific gravity

Pyknometer

pyo- A prefix derived from the Greek, indicating "pus"

pyoctanin Pyoktanin

pyocyanin $C_{14}H_{14}O_3N$ = 24 41 Cyopin A ptomaine produced by *Bacillus pyocyaneus*, it is the coloring matter of blue pus Cf *pyoxanthin*

pyogenic A microorganism that produces pus, especially in wounds

pyogenin A substance derived from pus cells, to which the formula $C_{16}H_{128}O_{19}N_2$ has been ascribed

pyoktanin Dahlia violet Methyl violet or methyl-aniline violet used as an antiseptic **p blue** Methyl violet **p yellow** Auramine

pyoluene $C_5H_9O_2SN$ = 133 2 Oxymethylallyl-sulfocarbamide, used medicinally as a bactericide

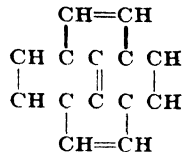
pyosin $C_{57}H_{110}O_{15}N_2$ (?) A protein derived from pus cells, m 238

pyoxanthin A brown pigment derived from pyocyanin

pyoxanthose A yellow pigment derived from pyocyanin by oxidation

pyr- See *pyro-*

pyracene. $C_{14}H_8$ = 176 1 The hydrocarbon

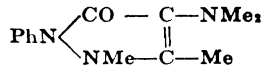


pyracetic acid Pyroligneous acid

pyraconitine $C_{32}H_{41}NO_9$ = 583 32 An alkaloid, m 171, from aconite

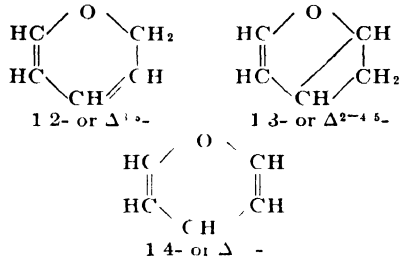
pyramid A polyhedron whose base is a polygon and whose faces are triangles, with a common vertex, and the sides of the polygon as bases Cf *crystal systems*

pyramidon $C_{13}H_{17}ON$ = 217 2 Dimethylaminoantipyrine, 1-phenyl-2 3-dimethyl-4-dimethylamino-5-pyrazolone, amidopyrine



Small colorless crystals, m 108, sparingly soluble in water, soluble in alcohol, ether, or benzene, used medicinally as an antipyretic It exists in the α- and β-forms, which have different solubilities

pyran C_5H_6O = 82 1 A group of heterocyclic compounds,



1 2- or $\Delta^{1,2}$- 1 3- or Δ^{2-4}- 1 4- or $\Delta^{3,5}$-

benzo- See *benzopyran* **dibenzo-** See *dibenzopyran* **diketo-** Glutaconic anhydride **keto-** Pyrone **naphtho-** See *naphthopyrane*

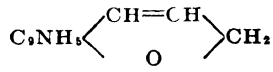
p dione Glutaconic anhydride

pyranil black A black sulphur dye

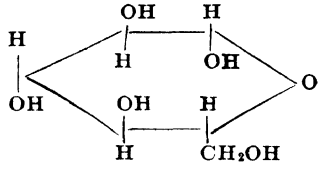
pyranol (1) Sodium acetyl salicylate (2) Chlorinated diphenyl

pyranone Pyrone

pyranoquinoline $C_{12}H_9ON$ = 182 1 The heterocyclic compound

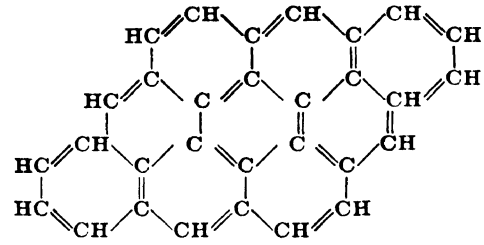


pyranose The cyclic form of glucose, *e g* ,



pyranoside A glucoside having a pyran ring, as, adenosine Cf *furanoside*

pyranthrene $C_{30}H_{16}$ = 376 2 The hydrocarbon



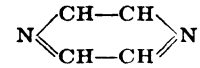
pyranthrone $C_{30}H_{14}O_2$ = 706 1 Dibenzoanthrone, dioxypyranthrene White solid

pyrantin $C_{12}H_{13}O_3N$ = 219 2 p-ethoxyphenylsuccinimide, phenosuccin, EtO C_6H_4 N(COC-H_2)$_2$ Colorless needles, m 155, slightly soluble in water, insoluble in ether, used as an antipyretic

pyranyl A group of monovalent radicals, C_5H_5O—, derived from pyran

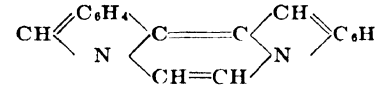
pyrargyrite $3Ag_2S\ Sb_2S_3$ Acrosite, aerosite A dark red silver ore

pyrazine $C_4H_4N_2$ = 80 1 Paradiazine, piazine, 1 4-diazine, q v ,

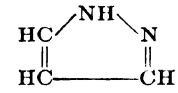


An isomer of pyrimidine and pyridazine Colorless crystals, m 47, b 118, soluble in water, alcohol or ether Cf *phenazine, benzophenazine, antipyrine* **dimethyl-** Ketine **hexahydro-** Piperazine **tetraphenyl-** Amaron

pyrazinodiisoindole $C_{18}H_{12}N_2$ = 256 1 The pentacyclic compound,

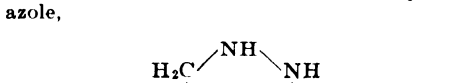


pyrazole $C_3H_4N_2$ = 68 1 α-pyrromonazole-1 2 diazole

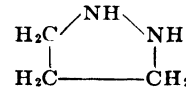


Colorless needles, m 70, b 187, soluble in water, alcohol or ether **dihydro-** Pyrazoline **iso-** *1 2*-Isodiazole **tetrahydro-** Pyrazolidine

p blue

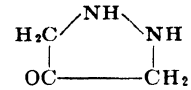


pyrazolidine $C_3H_8N_2$ = 72 1 Tetrahydropyrazole,

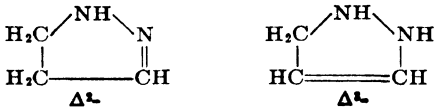


A diazine which does not occur in the free state **keto-** Pyrazolidine **phenyl-** N-phenylpyrazolidine A colorless liquid, b 160

pyrazolidone $C_3H_6ON_2$ = 86 1 Ketopyrazolidine The heterocyclic compound



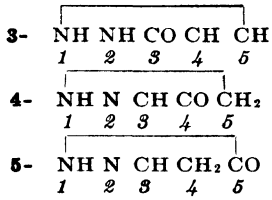
pyrazoline (1) $C_3H_6N_2$ = 70 1 Dihydropyrazole



A colorless liquid, b 144, soluble in water or alcohol (2) Antipyrine **keto-** Pyrazolone

pyrazolinium A pyrazoline with pentavalent nitrogen Cf *piperidinium*

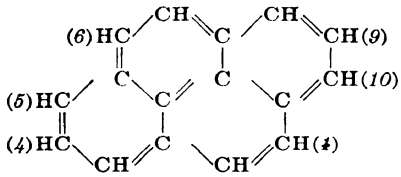
pyrazolone $C_3H_6ON_2$ = 84 13 Ketopyrazolines The heterocyclic compounds



A solid, m 165 (sublimes), soluble in water alcohol or ether **iodomethylphenyl-** Midrol **3-methyl-** Butyrolactazam **phenyldimethyl-** Antipyrine **phenyldimethyl-5-salicylate** Salipyrine **phenyldimethyl-4-amidomethane sulfonate** Melubrin **phenyldimethylamino-** Pyramidone

pyrazolyl The monovalent radical, $C_3H_3N_2$—, derived from pyrazole There are four isomers

pyrene (1) $C_{16}H_{10}$ = 202 2 Benzo[def]-phenanthrene A tetracyclic hydrocarbon from coal tar,



Colorless monoclinic crystals, m 148, b exceeds 360, insoluble in water, slightly soluble in alcohol, soluble in ether (2) Trade name for carbon tetrachloride used as a fire extinguisher Cf *pyrex*

pyreneite A grayish-black andralite (iron garnet, q v)

pyrenol Pyrenum, propyrin, sodium thymol benzoate A mixture of thymol and sodium benzoate and salicylate A white crystalline powder, soluble in water or alcohol, used medicinally as an expectorant, antispasmodic, antipyretic and antineuralgic

pyrenum Pyrenol

pyrethrin The active principle of pyrethrum

pyrethrol $C_{21}H_{34}O$ = 302 3 Pyretol An alcohol from the leaves of *Chrysanthemum cinerariaefolium* (insect powder) Silky white lustrous needles, m 222, insoluble in water, slightly soluble in alcohol, soluble in ether

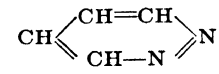
pyrethrone A ketone from pyrethrum, that forms pyrethrol

pyrethrum (1) Insect powder (2) Pellitory root The dried root of *Anacyclus pyrethrum*, a Compositae, used as local irritant **p camphor** $C_{10}H_{16}O$ = 152 1 A terpene from the essential oil of *Chrysanthemum parthenium*, a Compositeae

pyretol Pyrethrol

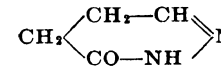
pyrex (1) A heat-resistant glass used for chemical utensils and household dishes (2) A trade name for carbon tetrachloride, used as a fire extinguisher Cf *pyrene*

pyridazine $C_4H_4N_2$ = 80 047 1 2- or *o*-diazine, q v ,



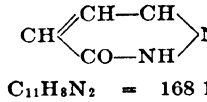
A colorless liquid, d 1 111, m −8, b 206, soluble in water, alcohol or ether

pyridazinone $C_4H_6ON_2$ = 98 1 A dihydroketopyridazine,

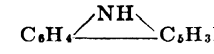


A colorless liquid, b 170, soluble in alcohol

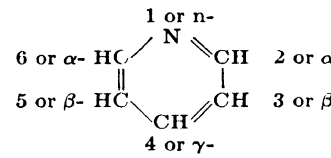
pyridazone $C_4H_4ON_2$ = 96 1 3-ketopyridazine



pyridindole $C_{11}H_8N_2$ = 168 1 A group of heterocyclic compounds



pyridine C_5H_5N = 79 1 The heterocyclic compound,



It occurs in coal tar, bone oil and many vegetable distillation products, including tobacco smoke A colorless liquid, d $_{15}^{15}$0 9893, m −42, b 115, soluble in water, alcohol or ether Used medicinally as an antiseptic, as a denaturant for alcohol, as a solvent for rubber and paint, and chemically, as a reagent for acetone and blood **allyl-** See *allylpyridine* **benzyl-** See *benzylpyridine* **dihydroketo-** Pyridone **dimethyl-** Lutidine **ethyldimethyl-** Parvoline **ethylmethyl-** (1) Aldehydine (2) Collidine **hexahydro-** Piperidine **hydroxy-** See *oxynicotinic acid* **methyl-** Picoline **methylethyl-** Aldehydine **oxy-** Pyridone **propyl-** Conyrine **tetramethyl-** Parvoline **trimethyl-** Collidine

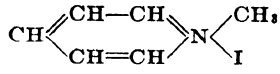
p bases The homologs of pyridine, $C_nH_{2n-5}N$

C_6H_7N	methyl-p	picolines
C_7H_9N	dimethyl p	β-lutidines
	ethyl p	α-lutidines
$C_8H_{11}N$	trimethyl p	γ-collidines
	ethylmethyl p	α,β-collidines, aldehydine
	propyl p	conyrine
$C_9H_{13}N$	tetramethyl p	parvulines
	ethyldimethyl p	parvolines
$C_{10}H_{15}N$	diethyldimethyl p	ethylcollidine, coridine
$C_{11}H_{17}N$		rubidine
$C_{12}H_{19}N$		viridine

p carboxylic acid **1-** or **alpha-** Picolinic acid **2-** or **beta-** Nicotinic acid **3-** or **gamma-** Isonicotinic acid **p dicarboxylic acid. 1.2-** Quinolinic acid **1 3-** Lutidinic

acid **1 4-** Isocinchomeronic acid **1 5-** Dipicolinic acid **2 3-** Cinchomeronic acid **2 4-** Dinicotinic acid **p pentacarboxylic acid** $C_{10}H_6O_{10}N$ = 299 10 $C_5N(COOH)_5$, +2- or $3H_2O$ A soluble acid, decomp 220 **p sulfonic acid** $C_5H_4NSO_3H$ = 159 1 Colorless needles, soluble in water, alcohol or ether, used in organic synthesis **p thiocyanate reaction** The production of a precipitate by certain metals (*e g*, Zn, Ni, Co) in the presence of pyridine and ammonium thiocyanate, used in gravimetric and microanalysis **p tricarboxylic acid.** $C_5H_2N(COOH)_3 2H_2O$ = 247 12 **1 2 3 4-** Carbo*cinchomeronic acid* **1 - 3 4 5-** Berberonic acid **1 2 4 5-** m 235 **1 2 4 6-** m 227 (decomp) **1 2 3 5-** m 323 **1.2 3 6-** m 71, b 130

pyridinium A series of compounds derived from pyridine, in which the heterocyclic nitrogen atom is pentavalent, *e g*,



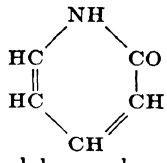
Cf *piperidinium*

pyridium Phenyl-azo-diamino pyridine A urinary antiseptic

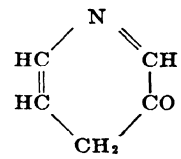
pyridol Hydroxypyridine The hydroxy-form of pyridone,

$$HO\,C_5H_4N \rightarrow O\,C_5H_5N$$

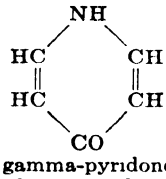
pyridone C_5H_5ON = 95 1 Ketopyridine, oxypyridine, pyridol, a group of heterocyclic ketones or quinones



alpha-pyridone
1-oxy-pyridine
m 106
b 281



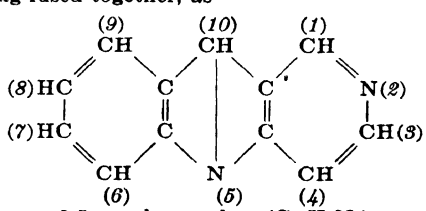
beta-pyridone
2-oxy-pyridine
m 124



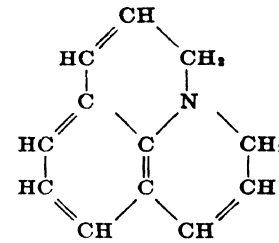
gamma-pyridone
3-oxy-pyridine
m 148

pyridopyridine $C_8H_6N_2$ = 130 06 1 5-Naphthyridine, 1 5-benzodiazine, q v An isomer of cinnoline, quinazoline and quinoxaline

pyridoquinoline $C_{12}H_8N_2$ = 180 1, and $C_{12}H_{11}N$ = 169 1 A group of heterocyclic compounds containing one or two nitrogen atoms and consisting of a quinoline and pyridine ring fused together, as



2 5-pyridoquinoline ($C_{12}H_8N_2$)

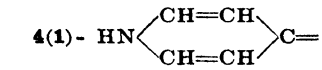


4 3 5-pyridoquinoline ($C_{12}H_{11}N$)

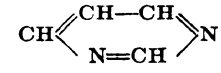
pyridoxin Adermin

pyridyl The monovalent radical, C_5H_4N—, derived from pyridine It is **c-pyridyl,** if substitution has taken place on the carbon atom of the ring, or **n-pyridyl,** if substitution has taken place on the nitrogen atom of the ring **ter-** q v **p amine** Aminopyridine

pyridylidene The bivalent radical C_5H_5N=, derived from pyridine, as,



pyrimidine $C_4H_4N_2$ = 80 047 1 3- or *m*-diazine, q v, metadiazine, miazine,



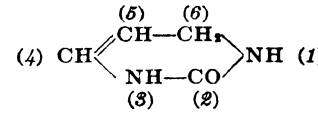
An isomer of pyrazine and pyridazine Colorless crystals of pungent odor, m 22, b 124, soluble in water, alcohol, or ether **dihydroketo-** Pyrimidone **2 6-dioxy-** Uracil **methyldioxy-** Thymine **2-oxy-6-amino-** Cytosine **2 4 6-trioxy-** See *barbituric acid*

p bases Compounds in nucleo proteins

dioxy-	uracil
methyldioxy	thymine
oxyamino-	cytosine
tetraoxy-	alloxan
trioxy-	barbituric acid

p dione Uracil **p tetrone** Alloxan **p. trione** Barbituric acid

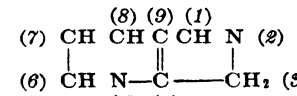
pyrimidone $C_4H_6N_2O$ = 98 06 Dihydroketopyrimidine



4-amino- Cytosine

pyrimidyl The monovalent radical, $C_4H_3N_2$—, derived from pyrimidine

pyrindol $C_7H_6N_2$ = 118 1 *2 4*-Pyrrolopyridine. The heterocyclic compound



pyrite (1) FeS_2 Brassil, native iron sulfide Yellow, shining crystals, commonly known as fool's gold (2) Native iron sulfide

pyrites A generic name for a group of sulfide minerals, as, iron pyrites FeS_2, copper-pyrite or chalcopyrite, tin-pyrite or stannite **arsenical-** Mispickel **arseno-** Arsenopyrite **auriferous-** A p containing gold **capillary-**

Millerite **cobalt-** Smaltite **copper-** The yellow ore, $CuFeS_2$ **coxcomb-** Marcasite **iron-** Pyrite **magnetic-** Pyrrhotite **nickel-** Millerite **radiated-** Marcasite **spear-** Marcasite **tin-** Stannite **white iron-** Marcasite

pyro- (1) Pyr- A prefix derived from the Greek, which indicates a connection with heat or fire, as pyroligneous acid, pyrometer (2) Pyroxylin

pyroacetic acid Crude acetic acid made from wood distillation products **p spirit** Acetone

pyroacid An acid produced by the loss of 1 mol of H_2O from 2 mol of an orthoacid (q v), *e g*, by heat Cf *pyroarsenic, pyrophosphoric acids*

pyroantimonate Any salt derived from pyroantimonic acid, as, $K_2H_2Sb_2O_7$, acid potassium pyroantimonate

pyroantimonic acid The hypothetical acid, $H_4Sb_2O_7$ Its sodium salt is insoluble

pyroarsenate A salt of pyroarsenic acid

pyroarsenic acid $H_4As_2O_7$ = 266 1 Diarsenous acid, $As_2O_3(OH)_4$ A tetrabasic acid obtained by heating arsenic acid to 180°C

pyrobitumen A constituent of shale oil, converted into bitumen by heat

pyroborate. A salt derived from pyroboric acid as, borax, $Na_2B_4O_7$

pyroboric acid The dibasic acid, $H_2B_4O_7$

pyrocatechin Pyrocatechol

pyrocatechoic acid *2 3*-Dihydroxybenzoic acid

pyrocatechol (1) $C_6H_6O_2$ = 110 08 Catechol, pyrocatechin, *o*-dihydroxy-benzene, 2-hydroxyphenol, *1 2*-benzenediol* Colorless leaflets, d 1 344 m 105, b 245, soluble in water, alcohol, or ether Used as an antiseptic and antipyretic, as a developer in photography, and as a weak reducing agent Cf *resorcinol, hydroquinol* (2) Protocatechols A group of diatomic phenols derived from catechol, as, homopyrocatechol, $C_6H_3Me(OH)_2$

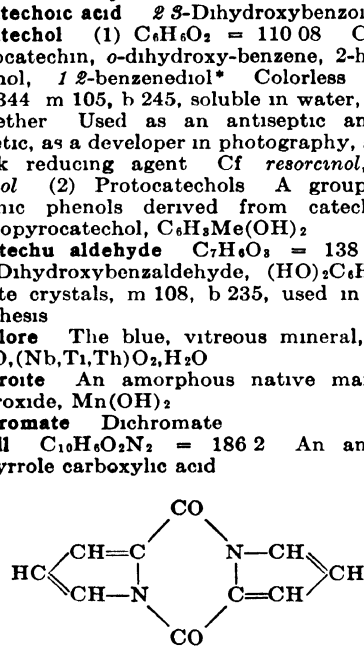
pyrocatechu aldehyde $C_7H_6O_3$ = 138 05 **o-** *2 3*-Dihydroxybenzaldehyde, $(HO)_2C_6H_3CHO$ White crystals, m 108, b 235, used in organic synthesis

pyrochlore The blue, vitreous mineral, $(CaFe, Ce)O,(Nb,Ti,Th)O_2,H_2O$

pyrochroite An amorphous native manganous hydroxide, $Mn(OH)_2$

pyrochromate Dichromate

pyrocoll $C_{10}H_6O_2N_2$ = 186 2 An anhydride of pyrrole carboxylic acid



Yellow leaflets, m 269, insoluble in water, soluble in alcohol or ether

pyrocomane 1 4-Pyrone

pyrocondensation A union of molecules brought about by heat, as, the formation of biuret from urea

pyrodextrin A brown tasteless decomposition-product of starch, obtained by heat

pyrodin $C_8H_{10}ON_2$ = 150 2 Hydracetin, phenacethydrazine, acetylphenylhydrazine, PhNH-NH OCMe A colorless crystalline powder m 130, soluble in alcohol, slightly soluble in ether or water, used medicinally as an antipyretic, and analgesic

pyroelectricity Thermal deformation A thermoelectric phenomenon, shown by crystals which become electrically charged if heated

pyrogallate Any salt or ether of pyrogallol

pyrogallic acid Pyrogallol

pyrogallol $C_6H_6O_3$ = 126 1 Pyrogallic acid, 1 2 3-trihydroxybenzene, *1 2 3*-benzenetriol* A light, white odorless, powder, needles or leaflets d $_{40°}$1 463, m 133, decomp 293 very soluble in water, alcohol, or ether Used as a reagent, chiefly to absorb oxygen, as a weak reducing agent, as a photographic developer, and medicinally, as an antiparasitic **acetyl-** Gallacetophenone **methylmethoxy-** Iridol **propyl-*p*-dimethyl-** Picamar **trimethoxy-** $C_6H_3(OMe)_3$ = 168 1 Pyrogallol trimethyl ether A colorless crystalline powder, m 47, b 235, soluble in alcohol or ether

p carboxylic acid *2 3 4*-Trihydroxybenzoic acid **p monoacetate** $C_9H_8O_4$ = 168 1 Eugallol, $CH_3COO\,C_6H_3(OH)_2$ A thick, dark-yellow, syrupy liquid readily soluble in water used medicinally for skin diseases **p phthalein** Gallein **p salicylate** Saligallol **p triacetate** $C_{12}H_{12}O_6$ = 252 1 Lenigallol, $(CH_3COO)_3C_6H_3$ A white, insoluble powder used as an antiseptic

pyrogen dyes Sulfur dyes

pyrogenic A reaction that occurs only at a high temperature, a reaction induced by heat

pyrographitic oxide $C_{22}H_2O_4$ = 330 02 A fine black powder produced by heating graphitic acid

pyrokomane 1 4-Pyrone

pyrole Misspelled for *pyrrole*

pyroligneous Pertaining to the distillation of wood **p acid** Wood vinegar Pyracetic acid Impure acetic acid obtained by the destructive distillation of pine tar and wood **p alcohol** Methanol **p spirit** Methanol

pyroline Misspelled for *pyrroline*

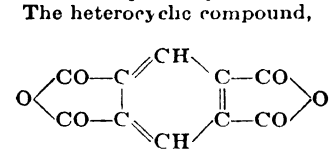
pyrolusite MnO_2 Polianite A native manganese dioxide, Cf *psilomelane*

pyrolysis The decomposition of organic substances by heat

pyrolythic acid Cyanuric acid

pyromagnetic Pertaining to heat and magnetism

pyromellitic acid $C_{10}H_6O_8\,H_2O$ = 272 12 Benzene-1 2 4 5-tetracarboxylic acid* $C_6H_2(COOH)_4$ Colorless triclinic tablets, m 275, soluble in water or alcohol Cf *mellophanic, prehnitic acids* **p anhydride** $C_{10}H_2O_6$ = 218 0 The heterocyclic compound,



pyrometallurgy That branch of metallurgy requiring heat treatment

pyrometer An instrument for measuring high temperatures (generally above 500°C) by mechanical, electrical or optical means Cf *thermometer, thermocouple* Methods

(a) *mechanical* thermocouples—which record temperature through a system of levers that magnify the stress or distortion of two joined metal strips

(b) *electrical* thermocouples—which indicate the temperature by measuring the current produced in a metal-metal junction, with a sensitive millivolt-meter

(c) *resistance* thermometers—which record temperature by measuring the change in resistance of a conductor exposed to the heat

(d) *optical* pyrometers—which measure the quality and intensity of the light emitted from a hot body or glowing material by comparison with some standard source of light

(e) *radiation* pyrometers—which measure the heat radiated by a hot body, usually by a thermocouple

pyrometric Pertaining to high temperature **p cone** Seger cone **p gage** See *gage*

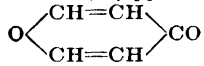
pyrometry A branch of physics dealing with the measurement of high temperatures

pyromorphite $3Pb_3(PO_4)_2\ PbCl_2$ Green lead ore, a native chlorophosphate of lead, of the apatite group

pyromucic acid $C_4H_3O\ COOH$ = 112 1 Furan-2-carboxylic acid, furoic acid Colorless monoclinic crystals, m 132, slightly soluble in water, soluble in alcohol or ether, used in the manufacture of *furoates* β- Eucusoic acid

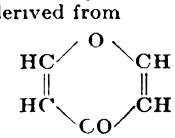
pyromucyl 2-Furoyl The monovalent radical, O CH CH CH C CO—, derived from pyromucic acid Cf *furoyl* **bi-** Furil **p chloride** $C_4H_3O\ COCl$ = 130 48 Furoyl chloride 2-furan carbonyl chloride A colorless liquid, m 0, b 60

pyrone $C_5H_4O_2$ = 96 1 Pyrocomane, pyrokomane, γ-pyrone An isomer of coumalin,

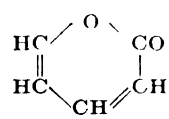


Colorless crystals, m 32, b 212 **benzo-** *1 2-* Coumarin *1 4-* Chroman **dibenzo-** Xanthone **hydroxy-** Kojic acid **p α- carboxylic acid** $C_5H_3O_2\ COOH$ = 140 06 Komanic acid A soluble solid, derived from chelidonic acid, decomp 250 **p dicarboxylic acid** Chelidonic acid

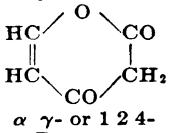
pyrones A series of heterocyclic compounds derived from alpha- or gamma-pyrone, which occur in numerous natural coloring materials, and in synthetic dyes and drugs They are derived from



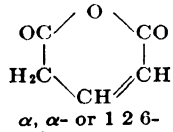
γ- or 1 4- Pyrocomane



α- or 1 2- Coumalin



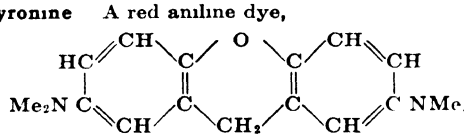
α γ- or 1 2 4- Pyronone



α, α- or 1 2 6- Glutaconic anhydride

benzo- Chromones **dibenzo-** Xanthones

pyronine A red aniline dye,



p dyes A group of aniline dyes containing the chromophore, =R R=

pyronone $C_5H_4O_3$ = 112 0 α,γ-pyrone An isomer of glutaconic anhydride, see *pyrones* **methylaceto-** Dehydracetic acid

pyrope An aluminum garnet, q v

pyrophore A carrier of fire, as, pyrophoric

pyrophoric Producing sparks when filed or rubbed, or burning spontaneously in air, *e g*, finely-divided metals or alloys **p alloy** A chromium-iron-cerium alloy, used in mechanical gas lighters **p lead** The pyrophoric lead-carbon mixture obtained on heating lead tartrate **p reaction** A reaction that causes flame, *e g*, $KMnO_4$ and H_2SO_4 placed in a beaker will set fire to filter paper

pyrophorus Having pyrophoric properties

pyrophosphate A salt of pyrophosphoric acid, as, $M_4P_2O_7$, $M_2H_2P_2O_7$

pyrophosphite A salt of pyrophosphorous acid as, $M_4P_2O_5$, $M_2H_2P\ O_3$

pyrophosphoric acid $H_4P_2O_7$ = 178 1 A tetrabasic acid, colorless crystals, m 61, soluble in water

pyrophosphorous acid $H_4P_2O_5$ = 146 03 A tetra-basic acid of trivalent phosphorous Colorless needles, m 38, soluble in water (decomp)

pyrophosphoryl The tetravalent radical $\equiv P_2O_3$, derived from pyrophosphoric acid **p chloride** $P_2O_3Cl_4$ = 251 86 $(Cl_2PO)_2O$ A colorless fuming liquid b 250, hydrolyzed by water to orthophosphoric acid and hydrochloric acid

pyrophyllite The mineral $Al_2O_3\ 4SiO_2\ H_2O$, resembling talc and montmorillonite Used as filler for paper, paint, rubber and textiles as a polishing agent for foods (rice, peanuts, etc), in lubricants and toilet preparations Cf *image stone*

pyroracemamide $C_3H_7O_2N$ = 87 1 The amide of pyroracemic acid $MeCOCO\ NH_2$ A colorless crystalline powder, m 124

pyroracemic acid Pyruvic acid

pyroracemic aldehyde Pyruvic aldehyde

pyrosal Salipyrine

pyrosine Erythrosin

pyrostilbnite Kermesite

pyrosulfate A salt of pyrosulfuric acid as, $M_2S_2O_7$ or MHS_2O_7

pyrosulfuric acid $H_2S_2O_7$ = 178 0 Disulfuric acid A fuming crystalline substance obtained by freezing Nordhausen acid

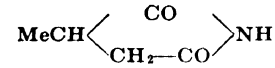
pyrosulfuryl The divalent radical $=S_2O_5$, derived from pyrosulfuric acid **p chloride** $S_2O_5Cl_2$ = 215 06 Sulfur pentoxy dichloride The chloride of pyrosulfuric acid A heavy, mobile, fuming liquid d1 844, b $_{730mm}$ 150 7, hydrolyzed by water to H_2SO_4 and HCl

pyrotartaraldehyde $C_5H_8O_2$ = 100 06 Methylsuccinaldehyde, CHO CH_2 CHMe CHO Colorless crystals

pyrotartaric acid $C_5H_8O_4$ = 132 1 Methyl succinic acid, methylbutanedioic acid,* pyrovinic acid A dibasic acid, $MeCH(COOH)CH_2$-COOH Colorless, triclinic crystals, d 1 411, m 112, soluble in water, alcohol or ether For isomers see *ethylmalonic acid* *n-* Glutaric acid **hydroxy-** Citramalic acid **p aldehyde** Pyrotartaraldehyde

pyrotartrate A salt of pyrotartaric acid

pyrotartrimide. $C_5H_7O_2N$ = 113 7 The heterocyclic compound



A colorless crystalline powder, m 66

pyrotechnics The production and manufacture of fireworks

pyroterebic acid $C_6H_{10}O_2$ = 114 08 *4*-methyl-*2*-pentenoic acid,* $Me_2C{=}CH\,CH_2COOH$ Colorless crystals, m 207

pyrothioarsenate A compound of the type, $M_4As_2S_7$

pyrotritaric acid Uvic acid

pyrouric acid Cyanuric acid

pyrovanadic acid The tetrabasic acid $H_4V_2O_7$ Cf *vanadic acid*

pyrovinic acid Pyrotartaric acid

pyroxene $CaO,MgO,2SiO_2$ A white, dark green or black silicate, which may contain iron or chromium

pyroxenite Websterite

pyroxylic spirit Methanol

pyroxylin Pyroxylinum, soluble gun cotton, collodion cotton, trinitrocellulose, collodium, colloxylin A group of substances obtained by nitrating cellulose and dissolving in a solvent of high boiling point, which consists of cellulose trinitrate, $C_6H_7O_5(NO_3)_3$, and tetranitrates, $C_6H_6O_5(NO_3)_4$ Used medicinally for artificial skin-covering, collodion, and in the manufacture of artificial silk, leather, oil cloth, and varnishes See *rayon*

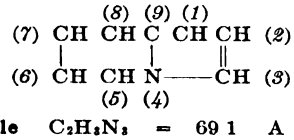
pyrrhosiderite Göthite

pyrrhotine Pyrrhotite

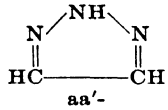
pyrrhotite FeS Pyrrhotine Magnetic pyrite A magnetic iron sulfide, which usually contains nickel

pyrrilium Pyrylium

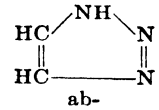
pyrrocoline C_8H_7N = 117 1 *8*-pyrrolopyridine The heterocyclic compound



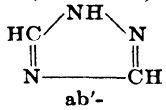
pyrrodiazole $C_2H_3N_3$ = 69 1 A group of pentatomic triazoles



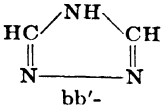
aa'-
1 2 5-
(osotriazole)



ab-
1 2 3-

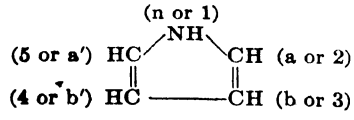


ab'-
1 2 4-



bb'-
1 3 4-

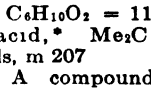
pyrrole * C_4H_5N = 67 1 Azole The heterocyclic ring compound,



A colorless liquid, d $_{20}$° 0 9481, b 130, insoluble in water, and soluble in alcohol or ether It is a constituent of bone oil, and its derivatives are used as antiseptics Cf *porphin ring* **cyan-** See *cyanopyrrole* **dibenzo-** Carbazole **dihydro-** Pyrroline * **dimethylethyl-** Kryptopyrrole **tetrahydro-** Pyrrolidine *

p α-carboxylic acid $C_4H_4N\,COOH$ = 111 08 A solid, decomp 191, soluble in water, alcohol or ether

pyrrolidine * C_4H_9N = 71 1 Pentasane, butylene imide, tetramethyleneimine, tetrahydropyrrole,

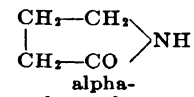


The base of proline and some alkaloids A colorless liquid, d 0 852, b 88, soluble in water, alcohol or ether **keto-** Pyrrolidone **methyldiketo-** Succinimide **pyridyl methyl-** Nicotine

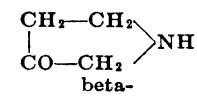
p alkaloids See *nicotine group* **p carboxylic acid** * Proline **p dione** * Succinimide

pyrrolidinium A derivative of pyrrolidine containing pentavalent nitrogen Cf *piperidinium*

pyrrolidone C_4H_7O = 71 1 A group of keto-pyrrolidines,



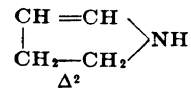
alpha-
γ-butyrolactam



beta-

pyrrolidyl The monovalent radical, C_4H_8N—, derived from pyrrolidine

pyrroline * C_4H_7N = 69 1 Dihydropyrrole,



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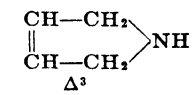
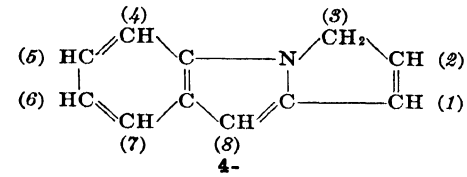


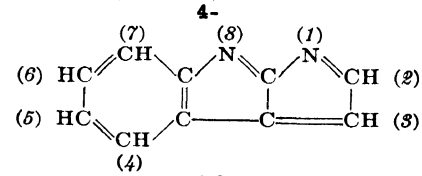
A colorless liquid, d$_{20}$° 0 910, b 90, very soluble in water, alcohol or ether

pyrrolinium A derivative of pyrroline containing pentavalent nitrogen Cf *piperidinium*

pyrroloindole $C_{11}H_9N$ = 155 1 and $C_{10}H_6N_2$ = 154 0 A compound with a fused pyrrole and indole nucleus, hence consisting of a benzene-ring and two pyrrole rings There are *e g*



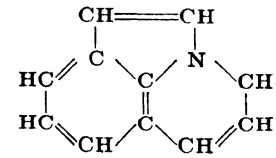
4-



1 8-

pyrrolopyridine $C_7H_5N_2$ or C_8H_7N A compound with a fused hexa- and pentatomic ring, each of which has one nitrogen, thus **2 4-** Pyrindole **8-** Pyrrocoline

pyrroloquinoline (1) $C_{11}H_9N$ = 155 1 The heterocyclic compound

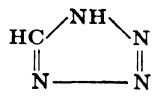


(2) Any tricyclic system containing a quinoline and a pyrrole ring

pyrrolylene Bivinyl

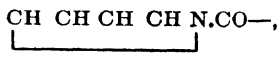
pyrromonazole **alpha-** Pyrazole **beta-** Glyoxaline

pyrrotriazole CH_2N_4 = 70 2 The pentatomic tetrazole



A colorless crystalline powder, m 156

pyrroyl The monovalent radical,



derived from pyrrole carboxylic acid

pyrryl The monovalent radical, C_4H_4N—, derived from pyrrole **C-** If the substituting radical is attached to a carbon atom **N-** If the substituting radical is attached to the nitrogen atom **p methyl ketone** C_6H_7ON = 109 1 **alpha-** C_4H_4N CO Me Colorless crystals, m 90, b 200

pyruric acid Cyanuric acid

pyruvaldehyde Pyruvic aldehyde

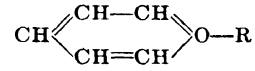
pyruvic acid $C_3H_4O_3$ = 88 1 Pyroracemic acid, keto-acetic acid, acetylformic acid, 2-oxopropanoic acid*, Me CO COOH or 2-hydroxy propenoic acid*, α-hydroxyacrylic acid, CH_2 - COH COOH A colorless crystalline powder or liquid, d 1 288 m 13 6, b 165 (decomp), soluble in alcohol, water or ether It is a distillation-product of racemic acid or ether, and is an intermediate product in the metabolism of proteins, fats and carbohydrates

pyruvic aldehyde $C_3H_4O_2$ = 72 1 Pyroracemic aldehyde, ketoacetaldehyde, acetylformyl, methyl glyoxal, propanolon, propanedione pyruvaldehyde, 2-oxopropanal* MeCO CHO

pyruvonitrile CH_3COCN = 69 03 Acetylcyanide, 2-oxopropanenitrile* A colorless liquid, b 93, decomp in water

pyrvolidine An alkaloid from the leaves of the wild carrot, *Daucus carota*, an umbelliferous plant

pyrylium Describing a series of compounds derived from pyran, in which the oxygen atom is supposed to be tetravalent



pyx (1) Trial of the pyx The periodical testing of coins issued by the British Mint (2) Pix **p liquida** Wood tar

Q

Q (1) Describing the seventh and outermost shell or orbit of electrons in the atom Cf *periodic system* (2) Symbol for quantity of electricity

q Symbol for heat entering a system

q v quod vide (which see)

qt An abbreviation for quart

Qu Abbreviation for quinine

quadrant (1) The quarter of a circle, an arc of 90 degrees (2) The distance from the pole to the equator = 10^7 meters or one-quarter meridian (3) See *Henry*

quadratic A cubical, tetragonal-shaped crystal Cf *crystal systems*

quadri- A prefix from the Latin, indicating four or fourfold (also *tetra-*)

quadribasic Describing a compound that has four hydrogen atoms replaceable by a base or metal, as, H_4SiO_4 **q acid** An acid whose molecules require four molecules of a monatomic base for its neutralization

quadrilateral Describing a four-sided figure

quadrimolecular Pertaining to four molecules **q reaction** A reaction in which four similar molecules react with one another

quadrivalent Having four different valencies, as bromine with a valency of 1, 3, 5, and 7 Cf *tetravalent*

quadroxalate An obsolete term for bioxalate, or salt of the type, MOOC COOH

quadroxide A binary compound of oxygen that contains four oxygen atoms

quadruple point The temperature at which four phases are in equilibrium, *e g*, a saturated solution containing excess of salt, (phases a solid, solvent, solution, and vapor) Cf *triple point*

quaker buttons Nux vomica

qualitative Pertaining to the kind or type **q analysis** The methods and procedures by which the constituents of a substance are detected **q reaction** A reaction that detects a substance in a mixture of substances

quality The degree of purity of a substance In general this can be classified as

C P = Chemically pure, tested, analyzed

U S P or B P = Conforming to the tests of the respective pharmacopoeia

A R = analytical reagent Suitable for use in analysis

pure = An ordinary commercial grade

technical = A somewhat impure grade

crude = An unrefined grade

quanta Plural for quantum, q v

quantitative Pertaining to the amount or percentage **q analysis** The methods and procedures by which the amount of a constituent in a material is determined **q reaction** (1) A reaction that determines the amount of a substance in a mixture of substances (2) A reaction that proceeds almost to completion

quantity The amount, active mass, or concentration of a substance, usually expressed in gram-molecules per liter **physical-** The magnitude or numerical value of a phenomenon They fall into two classes *Extensive* magnitudes, when the quantity has an additive effect, as, mass, volume, entropy *Intensive* magnitudes, when the quantities added increase the intensity of the effect, as, temperature, density, magnetic permeability

q of electricity The amount of electricity required to produce at unit distance (1 cm) a repulsion of unit force (1 dyne) in a vacuum This quantity corresponds with 1 international coulomb = 1/3600 ampere-hours = 1/96500 faraday = 3×10^9 electrostatic units

quantivalence The combining power or strength of an element or radical, expressed in terms of the number of hydrogen atoms with which it will unite (see *valence*)

quantivalent Describing an atom that can combine with two or more hydrogen atoms Cf *multivalent*

quantization A change from a normal atom to an excited atom, that is, electrons in the normal energy level are raised to a higher energy level by the absorption of energy *E g*, C in the normal state has electrons $2s^22p^{43}P$ but 1 6 volts excites it to the state $2s2p^{15}S$ Cf *quantum notation*

quantum Plural quanta Ergon A unit amount of energy, ϵ, set free or bound during the emission or absorption of radiations It is proportional to ν, the atomic frequency number of the radiation, and is given by the simple relation $\epsilon = h\nu$, where h is Planck's constant, $6\ 55 \times 10^{-27}$ erg-seconds The following relations exist $\epsilon = hc/\lambda$, where λ is the wavelength of the radiation involved, and $p = h/\lambda$, where p is the momentum of the guided particle Cf *orbit, energy level* This interaction between material particles and radiant quanta is shown by the following phenomena

1 *Photoelectric effect* the incident qu are wholly absorbed, some tear an electron from the atom, others appear as the kinetic energy of the electron

2 *Fluorescence* some increase the energy level of electrons, some increase the thermal energy, which is re-emitted as qu of lower frequency

3 *Compton effect* The qu encounters a free electron, shoots it out with a definite velocity, and is itself re-radiated at lower frequency

4 *Raman effect* The qu alters the energy of the system and is re-radiated at a different frequency (resulting in an absorption spectrum)

See *scattering, shift*

q efficiency The number of molecules transformed in a photolytic reaction per quantum of actinic light absorbed **q group** A number which defines spectroscopic terms, and represents a resultant of the orbital numbers of an atom Cf *Stoner quanta* **q mechanics** See *wave mechanics* **q notation** The normal energy levels are indicated by a quantum number (*see table*), and a given spectrum line is indicated by the change from one energy level

QUANTUM NUMBERS AND ENERGY LEVELS

(1)	(2)	(3)	(4)	(5)
K	K	1(1, 1)	K	H 1^2S_1
L_3	L_I	2(1, 1)	L_{11}	Li 2^2S_1
L_2	L_{II}	2(2, 1)	L_{21}	Li 2^2P_1
L_1	L_{III}	2(2, 2)	L_{22}	Li 2^2P_2
M_5	M_I	3(1, 1)	M_{11}	Na 3^2S_1
M_4	M_{II}	3(2, 1)	M_{21}	Na 3^2P_1
M_3	M_{III}	3(2, 2)	M_{22}	Na 3^2P_2
M_2	M_{IV}	3(3, 2)	M_{32}	Na 3^2D_2
M_1	M_V	3(3, 3)	M_{33}	Na 3^2D_3
N_7	N_I	4(1, 1)	N_{11}	K 4^2S_1
N_6	N_{II}	4(2, 1)	N_{21}	K 4^2P_1
N_5	N_{III}	4(2, 2)	N_{22}	K 4^2P_2
N_4	N_{IV}	4(3, 2)	N_{32}	K 4^2D_2
N_3	N_V	4(3, 3)	N_{33}	K 4^2D_3
N_2	N_{VI}	4(4, 3)	N_{43}	K 4^2F_3
N_1	N_{VII}	4(4, 4)	N_{44}	K 4^2F_4
O_5	O_I	5(1, 1)	O_{11}	Rb 5^2S_1
O_4	O_{II}	5(2, 1)	O_{21}	Rb 5^2P_1
O_3	O_{III}	5(2, 2)	O_{22}	Rb 5^2P_2
O_2	O_{IV}	5(3, 2)	O_{32}	Rb 5^2D_2
O_1	O_V	5(3, 3)	O_{33}	Rb 5^2D_3
P_3	P_I	6(1, 1)	P_{11}	Cs 6^2S_1
P_2	P_{II}	6(2, 1)	P_{21}	Cs 6^2P_1
P_1	P_{III}	6(2, 2)	P_{22}	Cs 6^2P_2
Q	Q	7(1, 1)	Q_{11}	87 7^2S_1

(1) *Siegbahn, 1918* Subscripts are in inverse order of intensity, 1 indicates the sub-series of most intense emission and of lowest frequency

(2) *Bohr and Coster, 1924*, "letter system" Subscripts denote the order in which the energy levels are filled in the sequence of atomic numbers

(3) *Bohr and Coster, 1923*, "*number system*" The number outside the parenthesis is the *total* quantum number the first of the two numbers in parenthesis is the *azimuthal* and the second the *inner* quantum number

(4) *Sommerfeld, 1924* The *azimuthal* and *inner* quantum numbers are the subscripts

(5) *Russell and Saunders "alkali-series term system"* Indicates the optical term into which each x-ray term probably merges when reduced to the alkali metal of the period to which an element belongs Read "two doublet S one" "two doublet P one" etc

(Adapted from International Critical Tables vol VI, 1929)

to another, thus K-L_{22} or L_{22}-M_{33} Generally Greek letters are used to indicate the intensity of the lines, the strongest line being α_1 thus (cf tables)

	Intensity
$K\alpha_1$ due to K-L_{22}	100
$K\alpha_2$ due to K-L_{21}	50
$K\beta$ due to K-M_{21}	35
$K\nu$ due to K-$N_{21\ 22}$	15

q number The integer n, which indicates the energy level of the electron orbit or the number of quanta $n = E/h\nu$, where E is the total radiation Cf *Bohr's atom, Rydberg's equation, hydrogen atom.* **q relation** Let λ be the wavelength in ÅU, ν the frequency ($\times 10^{12}$ per second), $h\nu$ the quantum per molecule ($\times 10^{-12}$ erg), then Q, the quantum energy of one mol matter in Kg cal ($9\ 06 \times 10^{23}\ h\nu$) is numerically

	λ	ν	$h\nu$	Q
red	7500	400	2 62	37 8
yellow	5900	508	3 33	48 6
blue	4900	612	4 01	57 9
violet	4550	659	4 32	62 3
ultraviolet	3950	759	4 97	71 8
ultraviolet	2000	1500	9 9	142

q state See *energy levels* **q theory** Energy changes take place in pulsations, not gradually, and always in multiples of a definite quantity, the quantum of energy, ϵ The mathematical treatment of this concept follows three forms (a) Matrix theory, *q v*, of Born, Heisenberg and Jordan (b) Wave mechanics, q v, of Schrodinger, *q v*, de Broglie, etc (c) Transformation theory, *q v*, of Dirac, and Jordan **q unit** Planck's constant

quarentoxide An oxide of a divalent metal of the type, M_4O, as, Cu_4O

quarry An open or surface working for minerals, as building stone, clay, slate, or limestone Cf *mine, outcrop*

quart Qt The fourth part of a gallon

1 quart = 0 946333 liters = 57 75 cubic inches = 2 pints

dry- The equivalent of 1 1012 liter **imperial-** The equivalent of 1 13586 liter or 69 3185 cubic inches, 2 5 lbs of distilled water occupy 1 quart **liquid-** The equivalent of 0 946 liter

quartation Inquartation The separation or "parting" of silver from gold by dissolving the silver in nitric acid This separation is quantitative when the alloy contains $\frac{1}{4}$ gold and $\frac{3}{4}$ silver and, if necessary, sufficient silver must be added to the alloy before the separation can be made

quarter (1) One-fourth part (2) An English measure of capacity, generally used for grain It contains 8 bushels **q wave plate** A plate of transparent material (*e g*, mica) used in petrological determinations of refractive index, so-called because it produces a phase-difference of $\frac{1}{4}$ of a wave-length of light between the two emergent beams

quartering A method of sampling coal or similar products by dividing a heap of it into approximately equal quarters, mixing opposite quarters, re-dividing the mixture into quarters, and continuing these operations until a sample of suitable size results

quartile See *frequency*

quartz Silicon dioxide, silica A glassy and sometimes well crystallized form of silica, SiO_2 which occurs as quartz, rock crystal, amethyst, citrine and smoky quartz, or in massive forms in veins, as rose or milky quartz When pure, native quartz occurs in colorless hexagonal crystals, d 2 66, hardness 7, mean refractive index 1 55 It occurs in two forms $\alpha \underset{573°C}{\rightleftharpoons} \beta$, is stable at any temperature below 870°C, and above 1200°C changes to cristobalite See

QUANTUM RELATION OF RADIATION AND ENERGY

Type	Wavelength λ in Å U	Wavenumber per cm	Frequency ν per sec	Erg per quantum $h\nu$	Cal per einstein $Nh\nu$	Electron volts EV
	(1)	(2)	(3)	(4)	(5)	(6)
x-rays	1	1×10^8	3×10^{18}	$1\ 96 \times 10^{-8}$	$2\ 84 \times 10^8$	12,337
	10	1×10^7	3×10^{17}	$1\ 96 \times 10^{-9}$	$2\ 84 \times 10^7$	1,234
	12 3	8×10^6	$2\ 7 \times 10^{17}$	$1\ 59 \times 10^{-9}$	$2\ 5 \times 10^6$	1,000
	100	1×10^6	3×10^{16}	$1\ 96 \times 10^{-10}$	$2\ 84 \times 10^6$	123
ultraviolet	500	200,000	6×10^{15}	$3\ 93 \times 10^{-11}$	570,000	25
	1,000	100,000	3×10^{15}	$1\ 96 \times 10^{-11}$	284,500	12 3
	1,234	81,000	$2\ 7 \times 10^{15}$	$1\ 59 \times 10^{-11}$	250,000	10
	2,000	50,000	$1\ 5 \times 10^{15}$	$9\ 82 \times 10^{-12}$	142,300	6 17
	3,000	33,333	1×10^{15}	$6\ 55 \times 10^{-12}$	94,840	4 11
violet	4,000	25,000	$7\ 5 \times 10^{14}$	$4\ 12 \times 10^{-12}$	71,120	3 09
blue-green	5,000	20,000	6×10^{14}	$3\ 93 \times 10^{-12}$	57,000	2 47
orange	6,000	16,666	5×10^{14}	$3\ 27 \times 10^{-12}$	47,400	2 06
red	7,000	14,286	$4\ 3 \times 10^{14}$	$2\ 81 \times 10^{-12}$	40,600	1 76
	8,000	12,500	$3\ 7 \times 10^{14}$	$2\ 42 \times 10^{-12}$	35,500	1 54
near infrared	10,000	10,000	3×10^{14}	$1\ 96 \times 10^{-12}$	28,450	1 23
	12,337	8,100	$2\ 7 \times 10^{14}$	$1\ 59 \times 10^{-12}$	25,000	1 000
infrared	100,000	1,000	3×10^{13}	$1\ 96 \times 10^{-13}$	2,845	0 12
	1,000,000	100	3×10^{12}	$1\ 96 \times 10^{-14}$	284	0 01

The relationship between various types of radiation and energy is illustrated by an example *e g*, bluegreen light (1) Its wave length, λ, is 5000 Å U, (2) The wave number is 20,000 waves per centimeter, (3) The frequency, ν, is 6×10^{14} waves per second, (4) Its energy per photon, or $h\nu$, is $(6\ 55 \times 10^{-27}) \times (6 \times 10^{14}) = 3\ 93 \times 10^{-12}$ erg (5) The heat energy per mole of activated molecules $Nh\nu$, is obtained by multiplying the energy of one photon (4) by the number of photons to activate one mole (N, Avogadro's number $= 6\ 06 \times 10^{23}$) and dividing by the number of ergs per gm cal $(4\ 185 \times 10^7)$ (6) The energy of the photon, in electron volts, is 2 47

silica The colored varieties are used as semi-precious stones The native varieties are

rock crystal	colorless, well-formed hexagonal crystals
amethyst	a red-violet, transparent variety
catalinite	a green, red, and brown mottled variety
cats eye	a green and brown variety
citrine	a yellow variety
rose quartz	a pale rose variety
milky quartz	an opalescent variety
smoky quartz	a gray variety

It is very resistant to acids, m 1750, and is used for chemical apparatus The transparent varieties (rock crystals) are used for piezoelectric plates, oscillators, lenses and other optical apparatus, as they are transparent to ultra-violet rays Fused quartz of great transparency is used for many optical and electrical instruments, and quartz threads are used for delicate suspensions because of their great elasticity

q apparatus Chemical utensils made from fused rock crystal that are highly resistant to sudden temperature changes and will not crack, as, beakers, crucibles, dishes, flasks, retorts, test tubes, and tubings They differ from the domestic fused silica ware, in that they are transparent **q lamp** Mercury vapor lamp **q lens** (1) A concave or convex lens cut from rock crystal, which is transparent to ultra-violet rays (2) A lens made from fused quartz **q oscillator** A section cut from a q crystal, used to tune radio circuits, as it shows sharply-tuned resonance **q resonator** Q oscillator **q rock** Quartzite

quartzite A white or yellow impure quartz

quassia Bitter wood, bitter ash The dried wood of *Picrasma excelsa* (Jamaica q) or *quassia amara* (Surinam q), a South American Simarubaceae It contains 0 03 % of quassin, and is used as a bitter tonic, hop substitute and vermicide **q wood** Quassia

quassic acid $C_{30}H_{38}O_{10} = 558\ 30$ A glucoside from quassia

quassin $C_{10}H_{12}O_3 = 180\ 1$ A bitter principle from Jamaica or Surinam quassia Colorless crystals, m 210, slightly soluble in water, soluble in alcohol, used as a tonic

quassoid The total bitter principles of quassia, used medicinally as a febrifuge and bitter tonic

quaternary (1) The last and most recent geologic epoch q v (2) A compound containing four

different elements or four types of atoms, as $NaHSO_4$ **q amines** Organic derivatives of NH_4OH in which the hydroxyl group and the four hydrogen atoms are replaced by radicals, as NMe_4I **q carbon atom** A carbon atom that is linked to four other carbon atoms

quebrachamine An alkaloid from quebracho Colorless crystals, m 142, insoluble in water, soluble in alcohol or ether

quebrachine $C_{21}H_{26}N_2O_3$ = 354 3 An alkaloid from quebracho bark Colorless or slightly yellow crystals, m 214, insoluble in water, soluble in hot alcohol or hot ether, used as an antiperiodic and tonic **hypo-** $C_{21}H_{26}O_2N_2$ = 338 26 A yellow or brown amorphous powder from quebracho bark, insoluble in water, soluble in alcohol or ether **q hydrochloride** $C_{21}H_{26}O_3N_2$ HCl = 390 7 A colorless crystalline powder, slightly soluble in water or alcohol, used medicinally for asthma

quebrachite Quebrachitol

quebrachitol $C_7H_{14}O_6$ = 194 11 Methoxy-pinite, *l*-inosite methyl ether, quebrachite, bornesitol Colorless crystals d 1 54, m 191, b_{6mm}210 Cf *pinite*

quebracho Aspidosperma The dried bark of *Aspidosperma quebracho blanco*, a South American tree, used medicinally as a tonic and antiasthmatic **q blanco** The dried and powderized bark of *Aspidosperma quebracho-blanco* It contains tannins and a number of alkaloids aspidospermine, hypoquebrachine, quebrachamine, quebrachine **q colorado** The dried wood of *Schinopsis* species, which contains **fisetin q extract** A liquid or solid extract from the heart-wood of quebracho, containing 35 % to 65 % tannin, used in the tanning industry **q gum** The dried juice of *Schinopsis lorentzii*, an Anacardiaceae of Argentine, used for tanning

quebrachomine An alkaloid from quebracho

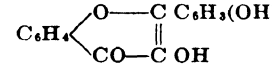
queen-of-the-meadow (1) The dried root of *Eupatorium purpureum*, a Compositae, used medicinally as the fluid extract, as an astringent and diuretic Cf *euparin* (2) Meadow sweet

queen's delight Stillingia **q 's root** Stillingia **q 's yellow** Mercuric subsulfate

quenching The act of cooling suddenly, as in tempering steel or in copper refining, the pouring of water on the molten metal

quercetagetin $C_{15}H_{10}O_8$ = 318 08 A yellow crystalline principle, m 318, derived from African marigold See *flavone*

quercetin $C_{15}H_{10}O_7$ = 302 16 Meletin, sophoretin, quercetinic acid, flavin,



tetrahydroxyflavanol A yellow dye obt by decomposition of quercitrin, a rhamnoside from oak bark A brown powder, d 1 58, m 312, slightly soluble in water, soluble in alkalis **hydroxy-** Myricetin Cf *rhamnetin*

quercetinic acid Quercetin

quercic, quercinic acid Quercin (2)

quercimetin Quercitrin

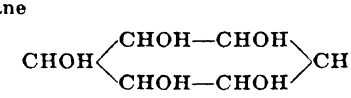
quercin (1) $C_6H_{12}O_6$ = 180 1 A bitter crystalline carbohydrate, from oak bark and acorns (2) $C_{15}H_{12}O_8 2H_2O$ = 308 1 Quercic acid, quercinic acid, oaktannin A light brown or yellow powder from the wood of *Quercus* species Cf *quercitannic acid*

quercitannic acid $C_{28}H_{26}O_{14}$ = 588 22 A tannin from oak bark, it is hydrolysed to oak-red

quercite Quercitol

quercitin (1) A glucoside in ragweed pollen (2) Quercetin

quercitol $C_6H_{12}O_5$ = 164 1 Cyclohexanpentol*, quercite, acorn sugar, pentahydroxycyclohexane



A colorless, crystalline substance of sweet taste found in oak bark, d 1 585, m 224 (decomp), soluble in water, slightly soluble in alcohol, insoluble in ether, an isomer of pinitol

quercitrin $C_{21}H_{22}O_{12} 2H_2O$ = 502 3 Quercimetin, quercitrinic acid A rhamnoside of quercitron bark, oak bark, **tea** leaves, **hops**, horsechestnut and other plants Yellow crystals, m 160–200, insoluble in water slightly soluble in alcohol and alkalis It is hydrolysed by acids to isodulcitol and quercetin and is used in their manufacture

quercitrinic acid Quercitrin

quercitron The coarse, powdered bark (25 % tannin) of *Quercus tinctoria*, a Cupuliferae of North America used in tanning leather and in dyeing wool and silk

quercus The dried bark of *Quercus alba* (white oak) a Cupuliferae Used medicinally as the fluid extract, as an astringent, technically, in the tanning industry

Quevenne's iron Reduced iron

quickening liquid A solution of mercuric nitrate or cyanide, used in electroplating

quicklime A calcined material, the major part of which is calcium oxide or hydroxide in natural association with a lesser amount of magnesium oxide, capable of being slaked with water

quicksilver Mercury **horn-** A native mercurous chloride

quick-vinegar process A method of manufacturing vinegar by passing weak alcohol slowly through vats filled with wood-shavings, which are covered with *Bacterium aceti*

quietol $C_{14}H_{27}NO_4$ HBr = 354 2 Valeryloxybutyrin hydrobromide Lustrous crystals, m 118, soluble in water, alcohol or ether, used medicinally as an antipyretic and hypnotic

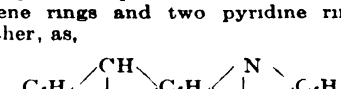
quillaia Quillaya, quillaja, soap bark, Panama bark The bark of *Quillaja saponaria*, a Rosaceae of South America, containing saponins Used for washing, as a foam producer in soft drinks, as an emulsifier, and in shampoos

quillaic acid $C_{15}H_{20}O_{10}$ = 418 3 A saponin from the bark of *Quillaja saponaria*

quina Cinchona bark

quinacetine $C_{27}H_{31}N_3O_2$ = 429 4 An alkaloid from cinchona bark **q sulfate** $(C_{27}H_{31}N_3O_2)_2H_2SO_4 H_2O$ = 974 8 An odorless, colorless powder, soluble in water Used medicinally as an antipyretic and anodyne

quinacridine. $C_{20}H_{12}N_2$ = 280 2 A series of pentacyclic compounds which consist of three benzene rings and two pyridine rings fused together, as,



quinaldic acid 2-Quinoline carboxylic acid **hydroxy-** Kynurenic acid

quinaldine $C_{10}H_9N$ = 143 13 α-Methylquinoline, $C_6H_4(N{=}CMe)(CH{=}CH)$ A colorless liquid, d 1 186, m −8, b 244, slightly soluble in water, soluble in alcohol or ether, used medicinally **naphtho-** See *naphthoquinaldine* **oxy-** See *oxyquinaldine* **phenyl-** See *phenylquinaldine*

quinaldinium compounds Derivatives of quinaldine in which the nitrogen atom is pentavalent, as, quinaldinium methyl iodide, $C_{10}H_9N(CH)_3I$

quinalizarin $C_{14}H_{12}O_2$ = 212 1 *1 2 5 8*-Tetrahydroanthraquinone A spot test reagent for beryllium, the violet color of an alkaline solution changes to deep blue

quinamicine $C_{19}H_{24}N_2O_2$ = 312 3 An alkaloid from cinchona bark

quinamidine $C_{19}H_{24}N_2O_2$ = 312 3 An isomer of quinamicine

quinamine $C_{19}H_{24}N_2O_2$ = 312 3 A crystalline alkaloid from cinchona bark Cf *apoquinamine*

quinanaphthol $C_{20}H_{24}N_2O_2(OHC_{10}H_6SO_3H)_2$ = 786 49 Quinaphthol, chinaphthol, quinine-beta-naphtholmonosulfate A yellow crystalline powder, m 185, soluble in water or alcohol used medicinally

quinane $C_{20}H_{24}N_2$ = 292 21 Desoxyquinine The heterocyclic hydrocarbon obtained by reduction of quinine

quinaphthol Quinanaphthol

quinaseptol Diaphthol **q silver** Argentol

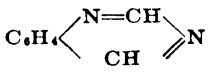
quinasitinic acid $C_9H_7NO_4$ = 193 1 Amidobenzoylglyoxalic acid $C_6H_4(NH_2)\,CO\,CO\text{-}COOH$

quinate A salt of quinic acid, as urea quinate **q of urotropine** Quinotropine

quinazerin Quinizarin

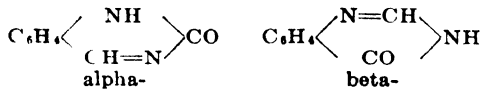
quinazine Quinoxaline

quinazoline $C_8H_6N_2$ = 130 06 Phenmiazine, benzopyrimidine 1 3-benzodiazine, q v The heterocyclic compound



Colorless crystals, m 48, b 243 **dihydroketo-** Quinazolone **diketotetrahydro-** Benzoyleneurea **ketodihydro-** Quinazolone **methyl-** $C_9H_8N_2$ = 144 1 2-Methylquinazoline A colorless crystalline powder, m 35, b 238, soluble in alcohol **oxy-** Quinazolone

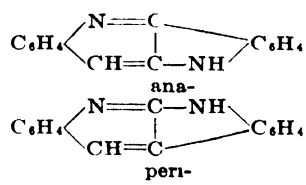
quinazolone $C_8H_6N_2O$ = 146 1 Oxyquinazoline ketodihydroquinazoline Cf *quinoxalone* The heterocyclic compounds



alpha- beta-

quince seeds The dried seeds of *Pyrus cydonia*, a rosaceous tree Used medicinally as the mucilage as a demulcent

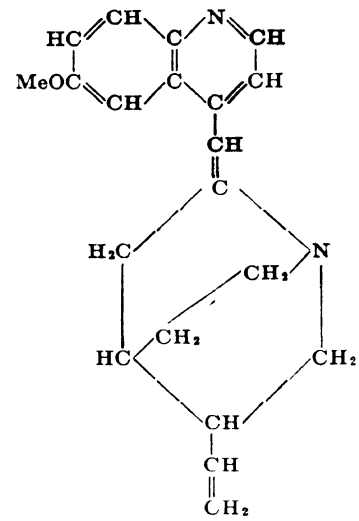
quindoline $C_{15}H_{10}N$ = 204 1 The heterocyclic compounds



ana-

peri-

quinene $C_{20}H_{22}N_2O$. Koenig's term for the heterocyclic parent compound of the quinine alkaloids



quinetum A mixture of the alkaloids of the cinchona bark in the same proportions as they occur in nature Cf *quinium, quinoidine*

quinhydrone $C_{12}H_{10}O_4$ = 218 14 A compound of quinone and hydroquinone $C_6H_4O_2\,C_6H_4(OH)_2$ A dark green powder, soluble in hot water, alcohol or ether, m 171, subliming **q electrode** A reversible electrode consisting of a platinum wire in a saturated solution of quinhydrone, which gives a well-defined potential in acid and neutral solutions, and is used as a standard in pH determinations Quinhydrone dissociates in solution to quinone and hydroquinone, hence it establishes the equilibrium $C_6H_4O_2 + 2H^+ + 2e \rightleftharpoons C_6H_4(OH)_2$ If E is the E M F , read against a saturated calomel electrode at 18°C the pH value is given by 2 03 + E/0 0577

quinhydrones A series of compounds or mixtures of quinones and hydroquinones, which are formed as intermediate products in the reduction of quinones

quinia Quinine

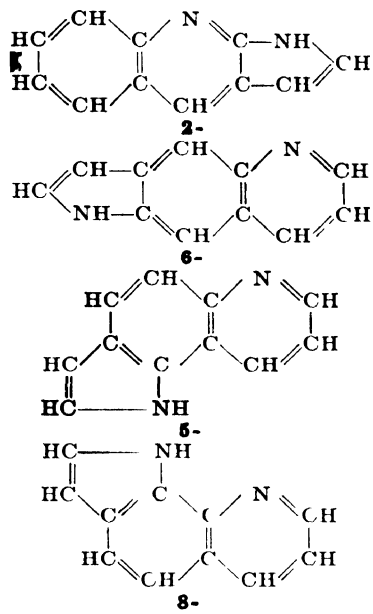
quinic acid $C_7H_{12}O_6$ = 192 1 Kinic acid hexahydrotetrahydroxybenzoic acid The monobasic acid, $C_6H_7(OH)_4COOH$, in cinchona bark Colorless monoclinic crystals, d 1 637 m 162 (decomp), soluble in water, alcohol or ether used medicinally for gout

quinicine $C_{20}H_{24}N_2O_2$ = 324 20 An amorphous alkaloid, m 60, isomeric with quinine and quinidine, obtained from cinchona bark

quinidamine $C_{19}H_{24}N_2O_2$ = 312 3 An alkaloid from cinchona bark

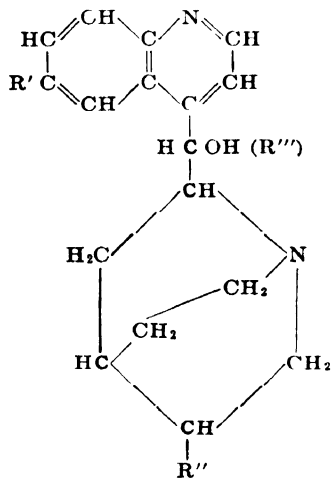
quinidine $C_{20}H_{24}N_2O_2$ = 324 2 An alkaloid from the bark of cinchona species the dextro isomer of quinine Colorless monoclinic prisms m 168, insoluble in water, soluble in alcohol, ether or chloroform Used medicinally as a cardiac rhythm regulator and similarly to quinine **q hydrochloride** $C_{20}H_{24}N_2O_2\,HCl$ = 360 8 White prisms, soluble in water, alcohol or ether **q sulfate** $(C_{20}H_{24}O_2N_2)_2\text{-}H_2SO_4$ = 746 4 A colorless crystalline powder, soluble in water, used as a quinine substitute

quinindole $C_{11}H_8N_2$ = 168 02 A series of heterocyclic compounds



quinine $C_{20}H_{24}O_2N_2$ = 324 3 Quinina, quinia, chinine *Qu* A levorotatory alkaloid from the bark of *Cinchona* species Colorless, long silky needles, m 175, slightly soluble in water and soluble in alcohol or ether Used medicinally as a stimulant, and in malarial fever Its dextrorotatory isomer is quinidine **beta-** Quinidine **desoxy-** Quininone **eu-** Quinine ethylcarbonate **salicyl-** Saloquinine

q alkaloids A group of alkaloids from cinchona bark, related to quinine The structure ascribed to quinine contains four asymmetric carbon atoms which are indicated by bold type **C**



The structure of the different alkaloids is indicated by substituting the following atoms or groups for the radicals

R′ R″	*levo*-isomer	*dextro*-isomer
H (*1*)	cinchonine	cinchonidine
H (*2*)	hydrocinchonidine	hydrocinchonine
OH (*1*)	cupreine	cupreidine
OH (*2*)	hydrocupreine	hydrocupreidine
OCH_3 (*1*)	quinine	quinidine
OCH_3 (*2*)	hydroquinine	hydroquinidine
OCH_3 (*3*)	ethylquitenine	ethylquitenidine
OC_2H_5 (*2*)	optochine	optochinidine
OC_5H_{11} (*2*)	eucupine	(eucupidine)
OC_8H_{17} (*2*)	vuzine	(vuzidine)

(*1*) is —CH CH_2, (*2*) is —CH_2 CH_2, (*3*) is —$COOC_2H_5$

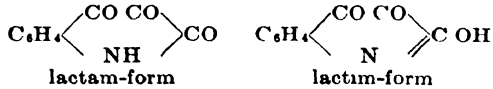
q acetate *Qu*$C_2H_4O_2$ = 384 3 A fine white crystalline powder, soluble in water or alcohol, used as a diuretic and in malaria **q acetylsalicylate** *Qu* CH_3COO C_6H_4 COOH Quinine aspirin, xaxaquin A white crystalline powder, used medicinally **q aesculinate** Escoquinine A yellow amorphous powder, insoluble in water, used medicinally **q albuminate** Yellow scales, soluble in acids, used as a tonic **q anisate** *Qu*$_2C_{10}H_{12}O$ - $2H_2O$ = 832 7 Anetholquinine Colorless crystals, soluble in alcohol or ether **q antimonate** *Qu*H_3SbO_4 = 513 2 Q stibnate A white powder insoluble in water, used medicinally as an antirheumatic **q arrhenate** *Qu*$_2AsO(OH)_2CH_3$ = 788 7 Q methylarsenate A colorless crystalline powder, m 140, insoluble in cold, slightly soluble in hot water **q arsenate** *Qu*$_2H_3AsO_4$ $8H_2O$ = 934 8 Colorless crystals, soluble in hot water, used medicinally as a tonic **q arsenite** *Qu*$_2H_2AsO_3$ = 773 6 A white powder, slightly soluble in water soluble in alcohol **q aspirin** Q acetyl salicylate **q benzoate** *Qu*$C_7H_6O_2$ = 446 3 Colorless crystals slightly soluble in water, soluble in alcohol, used medicinally **q borate** *Qu*H_3BO_3 = 386 3 A white crystalline powder, soluble in water or alcohol **q bromate** *Qu*$HBrO_3$ = 453 3 Colorless crystals, soluble in water or alcohol **q camphorate** *Qu*$C_{10}H_{16}O_4$ = 556 4 A white powder insoluble in water, soluble in alcohol or ether **q carbolate** Phenolquinine A white powder, slightly soluble in water, soluble in alcohol **q carbonate** *Qu*H_2CO_3 H_2O = 404 4 Colorless needles, soluble in water or alcohol, insoluble in ether **q chlorate** *Qu*-$HClO_3$ = 408 8 White crystals, soluble in water or alcohol (Dangerous, as it explodes when heated) **q chromate** *Qu*H_2CrO_4 $2H_2O$ = 478 4 Yellow needles, insoluble in water **q cinnamylate** *Qu* $C_9H_8O_2$ = 472 3 White crystals, soluble in water **q citrate** *Qu*$_2$-$C_6H_8O_7$ $7H_2O$ = 966 7 Colorless crystals, soluble in hot water or alcohol **q eosolate** *Qu*$_2C_9H_7O_{12}S_3$ = 1051 7 Q trisulfoacetylcreosote A quinine compound used in medicine **q ethylcarbonate** *Qu*Et_2CO_3 = 442 3 Euquinine A light powder of very fine needle-shaped crystals, m 89, slightly soluble in water, soluble in alcohol, ether or chloroform Used as a tasteless quinine substitute in medicine **q ferricyanide** *Qu*$_3Fe(CN)_6$ = 539 6 Yellow crystals, slightly soluble in water **q ferrosulfate** A brown powder, slightly soluble

in water, used medicinally as a tonic **q formate** $Qu CH_2O_2$ = 370 3 White glassy needles, soluble in water or alcohol, insoluble in ether **q glycerophosphate** $Qu_2H_2PO_4C_3H_7O_2\ 4H_2O$ = 892 6 Kineurine A white powder, soluble in hot water or alcohol, used medicinally as a tonic **q hydrochloride** $Qu HCl$ = 360 8 Colorless silky needles, m 156, soluble in water, alcohol, or ether **q hydroiodide** $Qu HI$ = 452 2 A yellow powder, soluble in alcohol **q hypophosphite** $Qu HPO_2\ 2H_2O$ = 424 3 Small white silky needles, decomp when heated and form PH_3, soluble in water, alcohol, or chloroform **q iodate** $Qu HIO_3$ = 500 2 Colorless needles, slightly soluble in water, soluble in alcohol **q ligosinate** An orange-yellow powder, insoluble in water, soluble in alcohol **q nitrate** $Qu HNO_3$ = 387 4 Colorless crystals, soluble in water or alcohol **q phenolsulfonate** $Qu C_6H_4(OH)SO_3H$ = 498 4 Quinine sulfocarbolate A yellow amorphous mass, slightly soluble in water, soluble in alcohol **q quinate** $Qu C_7H_{12}O_6\ 2H_2O$ = 552 4 A white or yellowish crystalline powder, soluble in water or alcohol **q salicylate** Saloquinine **q santonate** $Qu C_{15}H_{20}O_4$ = 588 5 A yellow powder, soluble in alcohol **q stearate** $Qu C_{18}H_{36}O_2$ = 608 6 Colorless crystals, soluble in alcohol, used for sunburns **q stibnate** Q antimoniate **q succinate** $Qu_2C_4H_6O_4\ 8H_2O$ = 910 8 Colorless needles, slightly soluble in water, soluble in alcohol **q sulfate** $Qu_2H_2SO_4\ 7H_2O$ = 872 8 The most frequently-used quinine salt Colorless silky needles, m 205, slightly soluble in water, soluble in alcohol, ether, or very dilute acids Used medicinally as an antipyretic, antiperiodic and antimalarial *iodo-* Herapathite **q s periodide** Herapathite **q sulfoguaiacolate** Sulfoguaiacin Yellow leaflets, soluble in water, used as an antiseptic **q sulfoiodoiodate** $Qu_2(H_2SO_4)_3(HI)_2I_4\ 3H_2O$ = 1760 26 Dichromatic crystals which polarise light similarly to tourmaline **q synthesis** Skraup's reaction **q tannate** $Qu(C_{14}H_{10}O_9)_3\ 8H_2O$ = 1434 7 A yellowish-white powder, partly soluble in alcohol **q trisulfoacetylcreosote** Q eosolate **q urea hydrochloride** Urea quinine A mixture of urea and quinine hydrochloride, a white powder, soluble in ether **q valerate** $Qu C_5H_{10}O_2\ H_2O$ = 444 4 White lustrous crystals, slightly soluble in water, soluble in alcohol

quininic acid $C_{11}H_9NO_3$ = 203 14 The monobasic acid, MeO C_9H_5N COOH Yellow prisms, m 280 (decomp), slightly soluble in water or ether, soluble in alcohol, used in organic synthesis

quininone $C_{20}H_{22}N_2O_2$ = 322 3 Rabe's name for the ketone of quinine (q v) in which the connecting CHOH group, (R‴), is replaced by the CO radical, while R′ is OCH_3 and R″ is CH CH_2

quinisatin $C_9H_5NO_3$ = 175 1 The heterocyclic lactam or lactim of quinasitinic acid

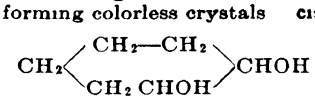


lactam-form lactim-form

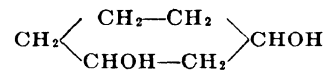
A colorless crystalline powder, m 257

quinite Quinitol

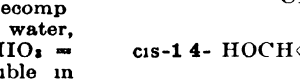
quinitol $C_6H_{12}O_3$ = 116 1 Quinite, *1 4*-cyclohexanol, cyclohexanediol A group of diatomic alcohols occurring in several cis- and trans forms, forming colorless crystals **cis-1 2-**



m 75, b 225 **trans-1 2-** m 100, b 225 **cis 1 3-** Resorcitol m 65 **trans-1 3-** m 89



cis-1 4-



m 102 **trans-1 4-** m 140 **iso-1 4-** A colorless liquid b 220

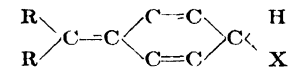
quinium Crude quinine which contains th alkaloids of cinchona bark An amorphou white mass, used in the manufacture of quinin and its salts Cf *quinetum, quinoidine*

quinizarin $C_{14}H_8O_4$ = 240 13 1 4-Dihydroxy anthraquinone, quinazerin A colorless solid m 280, insoluble in water, soluble in alcohol o ether

quinizine Antipyrine

quinoa The dried seeds of *Chenopodium quinoa* a Chenopodiaceae of Peru and Chile, used as food and yields a starchy flour

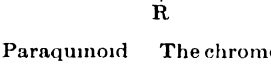
quinocarbonium A salt of organic compounds o the quinone type



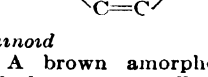
The dotted line indicates the carbonium valence

quinochromes Blue fluorescent products forme by the oxidation of vitamin B_1 with permanganate Cf *thiochrome*

quinogens An intermediate compound in th condensation of α-diketones to quinones, of th type



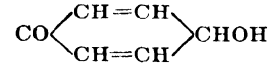
quinoid Paraquinoid The chromophoric group



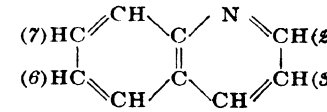
Cf *hemiquinoid*

quinoidine A brown amorphous mass whic consists of the non-crystallizable alkaloids o cinchona bark, used medicinally Cf *quinium*

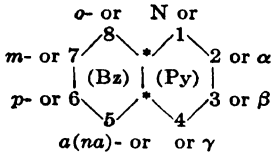
quinol $C_6H_6O_2$ = 110 05 Hydroquinone, 4-hydroxy-p-benzenone A tautomeric or keto form of hydroquinol,



quinoline $C_9H\ N$ = 129 1 1-Benzazine, chinoline A decomposition-product of quinine, an a distillation product from bone oil and petroleum, which consists of the heterocyclic compound



A colorless refractive oil, d $_{20}$°1 0944, m −20, b 238, aromatic odor, slightly soluble in cold water, soluble in hot water, alcohol, ether, benzene, or chloroform Used as a solvent for resins, camphor, and terpenes, and medicinally, as an antiseptic The derivatives are indicated by



position
1 or n- or Py-n-
2 or α or Py-1- or alpha
3 or β or Py-2- or beta
4 or γ or Py-3- or gamma
5 or a or Bz-4- or ana
6 or p or Bz-3- or para
7 or m or Bz-2- or meta
8 or o or Bz-1- or ortho

amino- Aminoquinoline **aminophenylmethyl-** Flavaniline **benzo-** Benzoquinoline **chloro-** Chloroquinoline **dibenzo-** Phenanthroquinoline **dimethyl-** Kryptidine **hydroxy-** Quinolinol **iso-** 2-Benzazine, leucoline A heterocyclic compound in which the nitrogen atom is in the 2-position A colorless crystalline mass, m 23, b 240, slightly soluble in water **methoxy-** Plasmoquin **methoxytetrahydro-** Kairine **α-methyl-** Quinaldine **γ-methyl-** Lepidine **α-oxy-** Carbostyril **tetrahydro-** $C_9H_{11}N$ = 133 1 1 2 3 4-tetrahydroquinoline A colorless liquid, b 244

q acids $C_9H_6N\,COOH$ = 173 1 There are seven mono-carboxylic acids of quinoline which are named according to the position of the carboxyl radical
ortho- or 8-quinoline carboxylic acid, m 187
meta- or 7-quinoline carboxylic acid, m 249
para- or 6-quinoline carboxylic acid, m 291
ana- or 5-quinoline carboxylic acid, m 369
alpha- or 2-quinoline (quinaldic acid), m 156
beta- or 3-quinoline (quinaldic acid) m 171
gamma- or 4-quinoline (cinchoninic acid) m 254

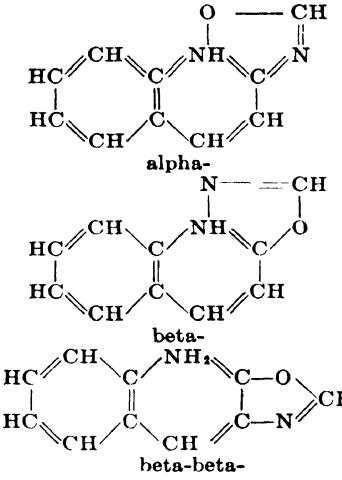
q aldehyde $C_9H_6N\,CHO$ = 157 12 alpha- or 2- A colorless crystalline powder, m 71, soluble in water **q alkaloids** See *alkaloids* **q blue** Cyanine **q dyes** A group of dyestuffs, photographic sensitizers and indicators which contain the quinoline ring See *cyanine* **q hydrochloride** $C_9H_7N\,HCl$ = 165 6 A colorless crystalline powder, m 94, soluble in water, alcohol, or ether **q red** $C_{26}H_{19}N_2Cl$ 1 1′-Benzilidene-2 2′-quinocyanine chloride A quinoline dye **q rhodanate** Q thiocyanate **q salicylate** $C_9H_7N\,C_7H_6O_3$ = 267 2 White crystals, soluble in water, glycerin, alcohol or ether, used as an antiseptic **q tartrate** $(C_9H_7N)_3(C_4H_6O_6)_4$ = 987 5 A white powder, m 125, soluble in water, alcohol, or ether, used as an antiseptic **q thiocyanate** $C_9H_7N\cdot HCNS$ = 188 2 Q rhodanate A yellowish crystalline mass, m 137, slightly soluble in water, soluble in alcohol, used as a bactericide

quinolinic acid $C_7H_5O_4N$ = 167 1 Pyridine 2 3-dicarboxylic acid*, $C_5H_3N(COOH)_2$ Colorless monoclinic crystals, m 190 (decomp), insoluble in water, slightly soluble in alcohol, soluble in ether

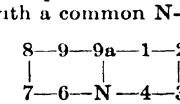
quinolinium compounds Derivatives of quinoline in which the N-atom is pentavalent, they are analogous to pyridinium and quinaldinium compounds

quinolinol C_9H_7NO = 145 06 Hydroxyquinoline **2-** Carbostyryl **4-** Kynurine **5-** m 224 **6-** m 193, b 360 **7-** decomp 238 **8-** Oxin m 76, b 267, used as a precipitant for aluminum

quinolinoxazole $C_{10}H_6ON_2$ = 172 1 Chinolinoxazole The heterocyclic compounds



quinolizine C_9H_9N = 131 1 A group of heterocyclic compounds consisting of two pyridine rings, with a common N-atom



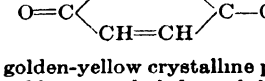
The single saturated C atom is marked 9a

quinolone Carbostyril

quinolyl Quinoyl The monovalent radical, C_9H_6N—, derived from quinoline There are seven possibilities of substitution (see *quinoline*)

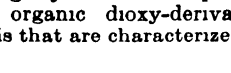
quinondiimine Quinone diimine See *quinone*

quinone* $C_6H_4O_2$ = 108 1 Benzoquinone, paradioxybenzene, benzenone, dihydrodiketo benzene



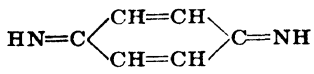
It forms golden-yellow crystalline prisms, d 1 31, m 116 (sublimes), slightly soluble in water, soluble in alcohol or ether, used as a reagent, **anthra-** See *anthraquinone* **benzo-** Quinone **dimethyl-** Xyloquinone **dinitrohydroxy-** Nitranilic acid **hydro-** Quinol **meri-** Meriquinone **methyl-** Toluquinol **naphtho-** Naphthoquinone **tetrachloro-** Chloranil

q chlorimide C_6H_4ONCl = 141 53 A solid, m 116 (subliming), soluble in ether or alcohol, slightly in water **q compounds** A series of organic dioxy-derivatives of ring-compounds that are characterized by the grouping,

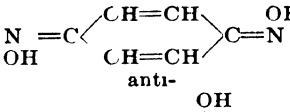


They are usually yellow in color, and are used as dyestuffs **q dichlorimide** $C_6H_4N_2Cl_2$ =

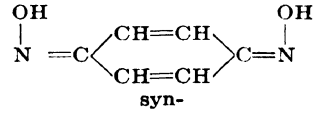
175 0 **A** solid m 164 (decomp) soluble in ether **q diimine** $C_6H_6N_2$ = 106 2



m 124 (decomp) **q dioximes** $C_6H_6N_2O_2$ = 138 10

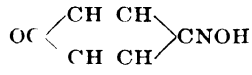


and anti-



syn-

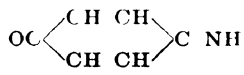
Decomp 240 **q diphenylmethane** Fuchsone **q imine** Quinonimine **q monoxime** $C_6H_5NO_2$ = 123 1 Quinoxime



Cf *nitrosophenol*, of which it is the stabler tautomeric form **q pigments** See *quinones*

quinones A group of yellow organic compounds characterized by the quinone grouping, as, brasilin, atrometin

quinonimine C_6H_5NO = 107 1



quinonoid The quinone structure Cf *quinone compounds, quinoid*

quinonyl The monovalent radical, $C_6H_3O_2$—, derived from quinone

quinopyrine Chinopyrine A combination of antipyrine and quinine hydrochloride, very soluble in water Used to treat malaria by sub-cutaneous injection

quinoquinoline 1 10-Naphthodiazine

quinoral Chinoral

quinosol. Chinosol, potassium oxyquinoline sulfate A yellow powder, soluble in water Used as a preservative of anatomical specimens Cf *superol*

quinotannic acid $C_{14}H_{16}O_9$ = 328 12 Cinchonatannin A tannin from cinchona bark, a light yellow powder, soluble in water

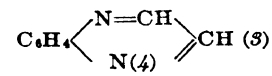
quinotropine Urotropine quinate, chinotropine, hexamethylene amine quinate A compound of urotropine and quinic acid, used medicinally

quinovic acid $C_{32}H_{48}O_6$ = 528 37. A white crystalline powder, soluble in chloroform or ammonium hydroxide

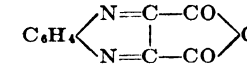
quinovin $C_{30}H_{48}O_8$ = 536 37 Kinocin, chinovin A glucoside from cinchona bark, m 235

quinovose A stereoisomer of rhamnose, a glucoside in cinchona bark

quinoxaline $C_8H_6N_2$ = 130 06 Benzo-p-diazine, quinazine, phenpiazine, 1 4-benzodiazine, q v

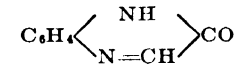


A colorless crystalline powder, m 30 5, b 226 slightly soluble in water, soluble in alcohol, used in organic synthesis **benzo-** See *benzoquinoxaline* **naphtho-** Naphthisodiazine **oxychloro diphenyl-** Luteol **tetrahydro-** $C_8H_{10}N_2$ = 134 2 1 2 3 4-Tetrahydro-quinoxaline Colorless crystals, m 97, b 289, soluble in alcohol **q dicarboxylic acid** $C_8H_4N_2(COOH)_2$ = 218 2 2 3- or ab- Colorless crystals, m 190, soluble in water or alcohol **q dicarboxylic anhydride** $C_{10}H_4O_3N_2$ = 200 1 The heterocyclic compound,

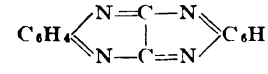


Colorless crystals, m 251

quinoxalone $C_8H_6ON_2$ = 146 1 The heterocyclic compound, (Cf *quinazolone*)



quinoxalophenazine $C_{14}H_8N_4$ = 232 2 The heterocyclic compound,



quinoxalyl The monovalent radical, $C_8H_5N_2$— derived from quinoxaline

quinoxime Quinone monoxime

quinoyl Quinone group

quinque- Quinqui- Pertaining to five

quinquemolecular Pertaining to five molecules **q reaction** A reaction in which five similar molecules react with one another

quinquevalent (1) Having five different valencies (2) Pentavalent **q nitrogen** See *-onium*

quinqui- Quinque-

quintal (1) A unit of weight in the English system, equal to 100 pounds (av) (2) A unit of weight in the metric system equal to 100 kilograms or 220 49 pounds, (av)

quintavalent Quinquevalent

quintenyl Amyl

quintessence A concentrated extract of any substance, as, an essential oil

quintuple point The temperature of a system at which five phases exist in equilibrium, as, salt a, salt b, double salt, solution and vapor Cf *triple-, quadruple point*

quitenidine $C_{19}H_{22}O_4N_2$ = 342 19 An oxidation product of quinidine Cf *chitenine*

quotient. A number obtained as a result of a division **albumen-** The number obtained by dividing the percentage of blood albumen by the percentage of total albumen **D-** The ratio of glucose to nitrogen in urine

q v An abbreviation for (1) quantum viz—as much as you wish, and (2) quod vide—which see

R

R An abbreviation for (1) organic radical, as R′ monovalent, R″ divalent, R′ ″ trivalent, etc (2) The gas constant, R = 82 07 cc atm per degree = 1 9885 cal per degree = 8 316 joules per degree (3) Reaumur degree, °R **R acid** 2-Naphthol-3 6-disulfonic acid **2R acid** 2-Amino-8-naphthol-3 6-disulfonic acid **R salt** The sodium salt of R acid

r Abbreviation for (1) racemic, (2) radius The symbol for the *röntgen* or x-ray intensity unit, q v

r_H Reduction intensity, oxido-reduction potential, q v

ρ The Greek letter rho (1) The symbol for the mathematical constant 0 47693 62762 (2) The *pros-* or **2 3**-position of naphthalene (3) the symbol for *rhe*, the absolute unit of viscosity

Ra The symbol for radium

ra Abbreviation for radioactive, as *ra*Cl = radiochlorine, *ra*Na = radiosodium

rabble An iron bar resembling a hoe, for stirring a molten metallic bath

rabbling The stirring or scraping of a charge of ore in a reverbatory furnace with an iron scraper

rabelaisin A poisonous glucoside from *Rabelaisia philippinensis*, a plant of the Philippines, used by the natives as an arrow poison

***ra*C** Radiocarbon

RaC′ Radium C′

racahout Starch or meal prepared from the edible acorn and used, mixed with sugar and flavoring, as an invalid food

raccahout Incorrect for *racahout*

racemate A salt of a racemic acid, generally of r-tartaric acid

racemation Racemization

raceme An optically-inactive compound that consists of equal quantities of dextro- and levo-compounds

racemic r- or *dl-* Inactive, but separable into dextro- and levorotatory compounds **r acid** (1) $C_4H_6O_6$ = 150 05 Paratartaric acid The dibasic acid HOOC CHOH CHOH COOH, an optically-inactive isomer of tartaric acid Colorless triclinic crystals, m 205, soluble in water, alcohol or ether It occurs in nature with d-tartaric acid Cf meso-*tartaric acid* (2) An equimolecular mixture of d- and l-acids, it is optically-inactive **r compound** A crystal which consists of an equal number of optically-active d- and l-molecules, but can be separated into its active constituents Cf *meso-compound* **r mixture** An optically-inactive mixture of equal quantities of a dextro- and levo-compound

racemisation Racemization

racemism The union of dextro- and levo-rotatory molecules to produce an inactive substance

racemization Racemation, racemisation The transformation of optically-active substances into optically-inactive substances or mixtures **auto-** The spontaneous transformation of an optically-active molecule into an optically-inactive molecule **partial-** An incomplete racemic transformation, which affects only one or a few asymmetric groups in a molecule

racemize To convert an optically-active substance into an optically-inactive substance

racemized Describing a substance or mixture that has been separated into its optically-active constituents

***ra*Cl** Radiochlorine

rackarock An explosive which is made on the spot as required, a mixture of $KClO_3$ and nitrobenzene, sometimes with picric acid

racking (1) The separation of ores by washing on an inclined plane (rack) (2) The final stage in brewing, when the liquor is clarified and run off ready for delivery (3) The almost complete separation of solid glycerides from cod-liver oil by cooling

raddle Hematite

radian (1) An arc of a circle that is as long as the radius of the circle (2) The angle subtended at the centre by the arc of a circle equal to the radius of the circle $180°/\pi = 57\ 29578° = 57°17'45'' = 206265'' = 1$ radian and $1° = 0\ 017453$ radians

radiant Diverging from a common center in all directions **r energy** A dynamic disturbance of the ether that diverges from a common center and manifests itself as heat, light, or electricity (see *spectrum*) **r flux** See *flux* **r heat** Heat waves **r matter** (1) The residual gas in a vacuum tube which has become luminous by the passage of a current of electricity (2) Radio-active matter **r state** (1) The condition of emitting light, as, incandescence, luminescence, fluorescence (2) Crooke s fourth state of matter

radiate To spread from a common center

radiated An arrangement of crystals in the shape of rosettes

radiated pyrite Marcasite

radiation (1) The transmission of energy through space, unassociated with the motion of material particles, and without loss or change, —*electromagnetic* **r** or *wave theory*, it accounts for interference, diffraction, refraction and polarization (2) The emission of material particles moving at high velocity, *corpuscular* **r** or *corpuscle theory*, it accounts for the photoelectric and Compton effects, the sharp spectral lines and the shift of wave length of x-rays scattered by electrons (3) Sometimes, the transfer or diffusion of energy through matter, as heat waves or sound waves Cf *ray*, *irradiation*, *absorption*, *light* **corpuscular-** A stream of particles, as, α-rays or canal rays, which consist of positively-charged atomic nuclei, or β-rays or cathode rays which consist of negatively-charged particles or electrons moving with the velocity of light **cosmic-** A penetrating r of very short wave length which reaches the earth from all directions of space, day and night, with equal intensity It is assumed that its origin is the interstellar or intergalactic space, and its cause the transformation of matter into energy, *e g*, the energy liberated when four hydrogen atoms form a helium nucleus Cf *packing effect*, *mass-energy cycle* **electromagnetic-** An electric field, E, oscillating at right angles to the direction of

propagation which is accompanied by a similar magnetic field, H, at right angles to the direction of both The distance of points with a similar magnitude of E and H is the *wave length*, λ, the number of oscillations in unit time at a given point is the *frequency*, ν The *velocity*, c, with which the waves travel through empty space is uniform for all radiations, hence $\nu = c/\lambda$ Cf *light* The *number of waves* per cm, is the wave-number, $n = 1/\lambda$, where λ is in cm , or $n = 10^8/\lambda$, where λ is in Å U See *Planck's constant* The types of e r are shown in the diagram and table It is assumed that all substances above the absolute zero of temperature send out e r at the cost of their own heat energy, the intensity of r increasing with a rise in temperature and the radiations becoming shorter in wave length Cf *Rydberg formula, spectrum, Bohr atom* **immaterial-** The vibratory disturbance of a medium, as, sound waves in air or electro-magnetic waves in ether **infraphotic-** See *electromagnetic-* **K-, L, M** See under *K, L, M*, etc **material-** Corpuscular- **mechanical-** Those material r which cause a vibration or oscillation of molecules, as, infraphonic, sound, ultraphonic, and heat waves **monochromatic-** A single colored r , which consists of waves of equal or approximately equal wave length **photic-** See *electromagnetic-, light* **polarized-** An electro-magnetic radiation in which the direction of the electromagnetic field of the waves is parallel, that is, the plane of the waves is parallel In *plane* p the plane remains constant, in *circular* p the plane rotates, the vector describing a screw-like motion, in *elliptical* p the plane rotates and also changes in quantity, the vector describing a helix wound around a rod of elliptical diameter **solar-** (1) The r of the sun which reaches the surface of the earth, its intensity is the "solar constant,"—the amount of energy per unit area and time 1 938 cal per min per $cm^2 = 1\ 35 \times 10^6$ erg per sec per $cm^2 = 1\ 81$ horse power per min per m^2 (2) The total radiation from the sun's surface, which is calculated to be $3\ 79 \times 10^{33}$ ergs per sec $= 5\ 43 \times 10^{27}$ cal per min or $5\ 08 \times 10^{23}$ horsepower per minute This quantity equals 89,500 cal per min per cm^2, or 84,000 horse power per min per m^2 of the sun's surface **ultraphotic-** See *electromagnetic-*

r constants See *Planck's formula, Stefan-Boltzmann equation* **r. effect** The phenomena produced when r falls on matter or is intercepted by a body The effects of r may be

A Physical,		(*Photophysical*)
1 mechanical		radiation pressure
2 thermal		pyroelectric
		thermionic
		thermallochromy
3 electrical		photoelectric
4 optical		luminescence
		fluorescence
		allochromy
B Chemical,		(*Photochemical*)
1 photographic	}	activation
2 phototechy		excitation
3 photolysis		ionization
4 oxidation and reduction		
5 synthesis, polymerization		
C Biological		(*Photobiological*)
1 photosynthesis	}	irradiation
2 phototropy		
3 phototaxis		

r hypothesis See *r theory* of chemical reaction **r pressure** The force exerted by light o particles that it strikes, as, in the comet's tai which is pushed away from the sun's direction Cf *radiometer* On the earth surface r pres sure is exceedingly small, thus sunlight fallin at right angles exerts a pressure of only 4 5 × 10^{-5} dynes (the weight of 1/28,000 cc air) I the interior of a star it may assume enormou proportions, thus for the interior of the Sun $8\ 5 \times 10^{14}$ dynes per cm^2 (a pressure of 83 × 10^7 atm) **r temperature** See *radiator* **r theory of chemical reaction** The applicatio of the quantum theory to chemical reactions o the following assumptions (a) Before a molecul can react, the electrons of its constituent atom must become excited (b) The energy, E, pe gram molecule required to activate the molecul (the critical increment) may be calculated fror the temperature coefficient of the reaction rate K, by $\frac{d \log_2 K}{dT} = \frac{E}{RT^2}$ (c) Each molecule activated by one quantum, hence, the tot energy absorbed is, $E = Nh\nu$, where N Avogadro's number or the number of molecule Cf *irradiation, radiometer*

radiator A body heated to incandescence, whic emits an increasing amount of energy as th temperature is increased **perfect-** Black bod A material absorbing all radiant energy (i e reflecting no light) and transforming it into hea Its emitting power is large and proportional t its temperature The *total energy* of its radi tion is proportional to the fourth power of a absolute temperature (Stefan's law) The *wa length* having maximum intensity is 0 289/ (Wien's law) The *intensity* of the radiatio for any wave-length is found by Planck equation

radical (1) A group of atoms that passes u changed through a chemical reaction and b haves as a single atom, as, $(NH_4)^+$ or $(SO_4)^=$ The following symbols are used to indicate t more common radicals

Ac	acetyl, CH_3CO— (also acet or acyl)
Am	ammonium, NH_4— (or amy
Bu	butyl, C_4H_{10}—
Bz	benzoyl, C_6H_5CO—
Cy	cyan, CN—
Et	ethyl, C_2H_5—
Me	methyl, CH_3—
Ox	oxalic, $(COO)_2$=
Ph or φ, ϕ	phenyl, C_6H_5—
Pr	propyl, C_3H_7—

Compare also *Organic radicals*, q v , and pu lished by the chemical societies

Other abbreviations frequently used are,

R	for radical
M	for any metal, usually monovale
X	for any halogen or acid radical

(2) A free radical, q v **acid-** An electronegati group of atoms that does not decompose ordinary chemical reactions See *acid radica* **acyl-** Ac An acid organic radical of the gene type R CO— **alkyl-** Al An aliphatic orgar radical, as Me or Et **aryl-** Ar Any ar matic organic radical, as, Ph or Bz **free-** general, an unsaturated molecule, particular a substance existing only in equilibrium with

compounds, as, triphenyl methyl in equilibrium with its dimer hexaphenylethane, methyl in equilibrium with tetramethyl lead **organic-** An unsaturated group of atoms which confers characteristic properties on a compound containing it, or which remains unchanged during a series of reactions, as —COOH carboxyl, or —CHO aldehyde radical See *organic radicals*, *structure symbols* **r weight** The sum of the atomic weights of the elements in the r

radio- A prefix derived from the Latin which indicates a connection with rays or radiations **r chlorine** *ra*Cl See *chlorine* **r elements** See *radioelements*, and table

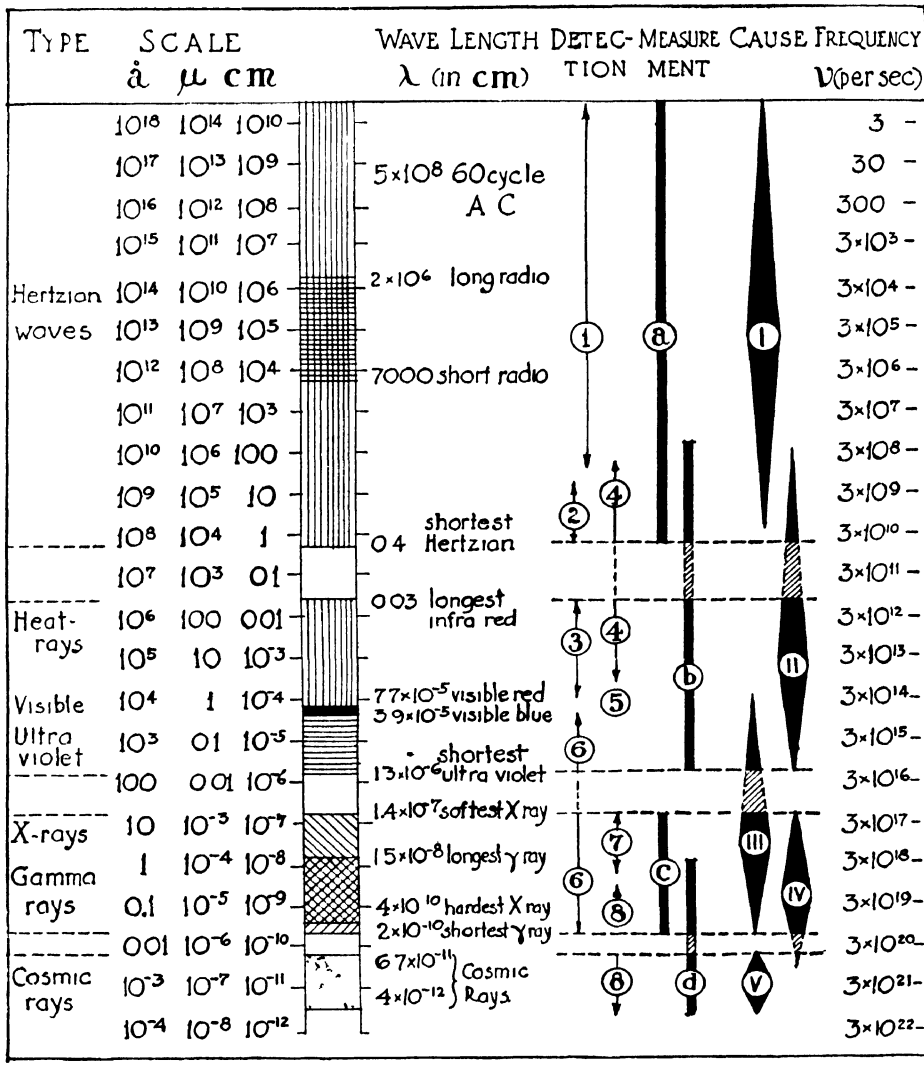
radioactinium RaAc A radioactive-disintegration product, atomic weight 226, atomic number 90, formed by the disintegration of actinium It is an isotope of thorium and has a life period of 28 1 days and then disintegrates to actinium x

radioactive Having the property of giving off rays **r constant** The factor, (λ), indicating the life period of a radioactive element in the equation, $\frac{dn}{dt} = \lambda n$, or $n = n_0 e^{-\lambda t}$, where n_0 is the number of atoms originally present, n, the number of atoms present after time t, and e the base of natural logarithms **r decay** The speed of disintegration, given by

$$N_1 = N_0^{-\lambda t} \quad \text{or} \quad N_1/N_0 = e^{-\lambda t}$$

where N_0 number of atoms originally present
N_1 number of atoms remaining after t time
λ radioactive transformation constant
e base of nat log , 2 71828

r disintegration The breaking up of an atom of a radioactive element as indicated by the arrows in the figure Thus a horizontal arrow indicates the loss of a helium nucleus (alpha-radiation), the element therefore becomes more electropositive and the atomic weight decreases by four An inclined arrow indicates the loss of an electron (beta-radiation), the element therefore becomes more



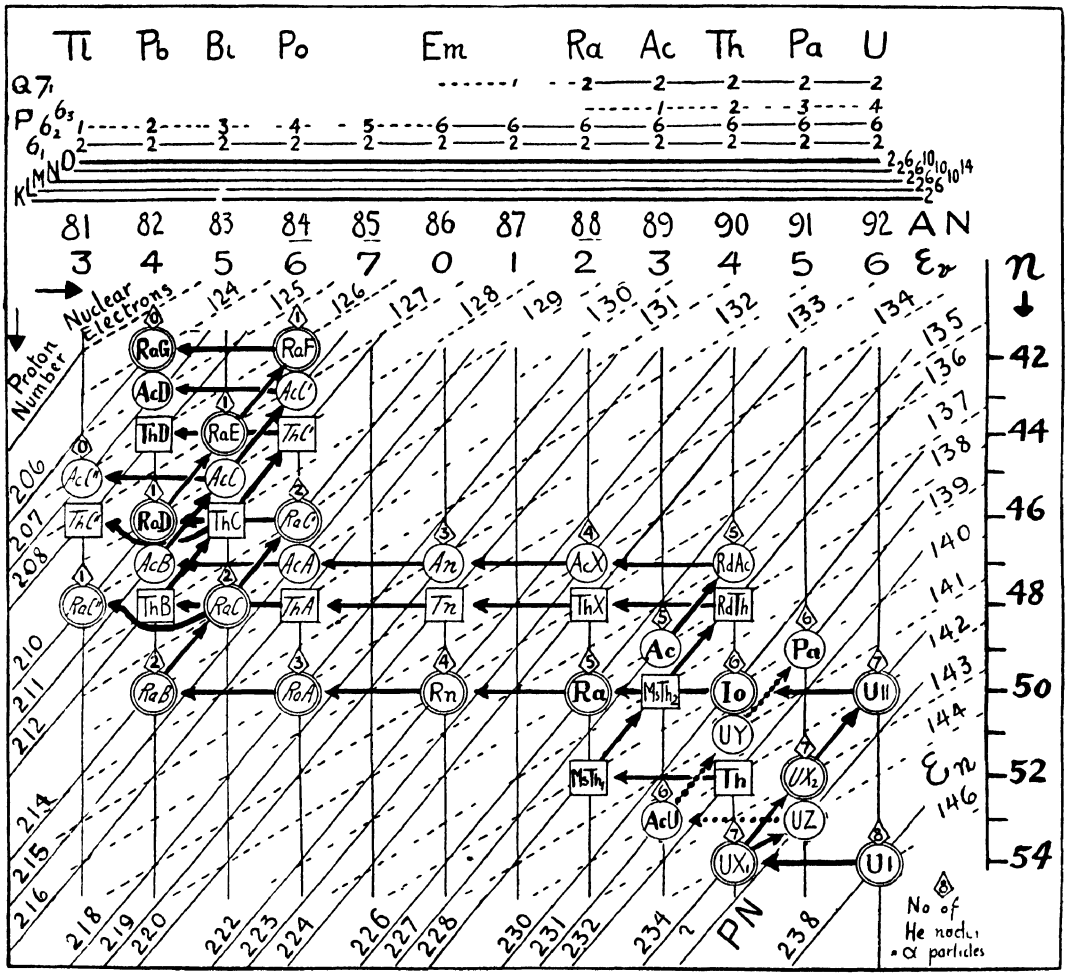
Electromagnetic radiations
showing wavelengths and methods of measurement

ELECTROMAGNETIC SPECTRUM

Wavelengths		Type	Generation or cause	Detection	Measurement
In centimeters	In other units				
(1)	(2)	(3)	(4)	(5)	(6)
		Infraphotic radiations			
5×10^{8}	5000 km	Electric waves	I	1	a
2×10^{6}	20 km	long radio waves	I, II	1	a
5×10^{4}	500 m	long broadcast	II	1	a
2×10^{4}	20 m	short broadcast	II	1	a
1×10^{3}	10 m	short radio	II	1	a
1×10^{-2}	0 01 mm	shortest Hertzian	III	1, 2, 4	a, b
3×10^{-2}	0 03 mm	longest infrared	IV	3, 4	b
$7\ 7 \times 10^{-5}$	7700 Å	shortest infrared	IV	3	b
		Photic radiations			
$7\ 7 \times 10^{-5}$	7700 Å	longest visible	V	5	b
	7700-6470	red			
	6470-5860	orange			
	5860-5350	yellow			
	5350-4920	green			
	4920-4220	blue			
	4220-3900	violet			
$3\ 9 \times 10^{-5}$	3900 Å	shortest visible	V	5, 6	b
$3\ 9 \times 10^{-5}$	3900 Å	longest ultraviolet	VI	6	b
	3200-3000	tan-producing			
	3000-2700	anti-rachitic			
	2200-1800	Schumann rays			
	1200-130	Lyman rays			
$1\ 3 \times 10^{-6}$	130 A	shortest ultraviolet	VI	6	b
		Ultraphotic radiations			
$1\ 4 \times 10^{-5}$	1000 A	longest x-ray	VII	6, 7	c
	14 A	soft rays			
	0 03 A	hard rays			
$1\ 4 \times 10^{-8}$	1 4 Å	longest gamma ray	VIII	6, 7	c, d
	0 5-0 06Å	therapeutic gamma			
3×10^{-10}	0 03 Å	shortest x-rays	VII	6, 7	c, d
1×10^{-10}	0 01 Å	shortest gamma rays	VIII	6, 7	c d
8×10^{-12}	0 0008 Å	longest cosmic ray	IX	8	d
3×10^{-13}	0 00003 A	shortest cosmic ray	IX	8	d

(1) *The wave lengths are given uniformly in centimeters*
(2) Other units are km = kilometer, m = meter, mm = millimeter, Å = ångstrom units
(4) *The generation or cause of these radiations is as follows*
I—Coil rotating in magnetic field
II—Oscillating triode valve, spark gap, etc
III—Spark gap discharge
IV—Heat radiations (chemical reactions)
V—Radiation from hot bodies and ionized gases
VI—Radiations from very hot bodies and ionized gases
VII—Emitted by sudden stoppage of fast-moving electrons
VIII—Emitted when atomic nuclei disintegrate (radioactivity)
IX—Condensation of matter and transformation into energy
(5) *The detection of the various radiations is shown by*
1—Electric resonance in a receiving set (coherer, rectification and amplification)
2—Nichols' radiometer
3—Bolometer
4—Thermometer or thermocouples
5—Selenium cell
6—Photographic plate and phosphorescence
7—Photoelectric effect
8—Ionization of gas
(6) *The measurement is accomplished by*
a—Quality of resonant electric circuit
b—Interferometers or gratings
c—Crystal diffraction
d—Absorption coefficients

electro-negative and the atomic weight remains the same *artificial-* or *synthetic-* The breaking up of an element which has been exposed to bombardment with particles (protons, neutrons deutons, etc) See *radioelements, nuclear reactions* **r earth** Soil containing one microgram of radium per pound, used medicinally for external packs **r elements** The elements of high atomic weight, which disintegrate spontaneously with the emission of various rays There are three series beginning with uranium, actinium, and thorium (see table), and three types of radiation (1) The emission of alpha-particles, or helium nuclei, lowers the atomic weight of the element by four and the atomic number by two (2) Beta-particles, or negative electrons, increase the atomic number by one, as the element becomes more positive, but the atomic weight remains the same (3) Gamma-rays, or x-rays, are a secondary phenomena caused by the beta-rays striking an obstacle For synthetic or artificial r elements, see *radio elements, nuclear reactions* **r equilibrium** A state of balance in a mixture of radioactive elements consisting of products of such long life-periods that their radiations and compositions may be considered constant, or, the decay may be balanced by the formation of fresh products, as in the transformation of radon into helium **r indicator** Radiothor A r substance, used to detect small quantities of its isotope in chemical analysis It is mixed in minute amounts with the isotope, and the resulting mixture behaves as a single chemical substance, although the former



Radioactive disintegration

showing the uranium, actinium, and thorium series, and the relation existing between atomic weight, valency, rays and isotopes

◎ = uranium-radium family, □ = thorium family, ○ = actinium family, ← α-rays, the atom loses one helium nucleus, ↗ β-rays, the atom loses one electron

A, B	Average life of isotope is over a year
A, B	Average life of isotope is between one hour and a year
A, B	Average life of isotope is less than one hour

The following relations exist $A = e - n = (p - n)/2$, and $e = p - A = (n + A)$, where A is the *atomic number* e the number of *nuclear electrons*, p the number of *protons* and n the number of *neutrons*

RADIOACTIVE ELEMENTS AND CONSTANTS (1931)*

(1) Element	(2) Symbol	(3) Proton number	(4) Atomic number	(5) Half period T	(6) Average life τ	(7) Decay constant λ in (sec)$^{-1}$	(8) Range R_{15}	(9) Absorption μ	(10) Rays	(11 Isotope
Uranium family										
Uranium I	UI	238	92	$4\,4 \times 10^{9}$ yr	$6\,3\,10^{9}$ yr	5×10^{-18}	2 67		α	U
uranium X_1	UX_1	234	90	24 5d	35 4d	$3\,28 \times 10^{-7}$		460	β	Th
uranium X_2	UX_2	234	91	1 14m	1 64m	0 00101		18	β	Pa
uranium Z	UZ	234	91	6 7h	9 7h	$2\,87 \times 10^{-5}$		270–36	β	Pa
uranium II	UII	234	92	3×10^{5} yr	$4\,3 \times 10^{5}$ yr	$7\,4 \times 10^{-14}$	3 12		α	U
uranium Y	UY	231 or 230	90	24 6h	35 5h	$7\,8 \times 10^{-6}$		300	β	Th
Ionium-radium family										
Ionium	Io	230	90	$8\,3 \times 10^{4}$ yr	$1\,2 \times 10^{5}$ yr	$2\,6 \times 10^{-12}$	3 19		α	Th
radium	Ra	226	88	1590 yr	2295 yr	$1\,38 \times 10^{-11}$	3 39	312	α	Ra
radon	Rn	222	86	3 825d	5 518d	$2\,097 \times 10^{-6}$	4 12		α	Em
radium A	RaA	218	84	3 05m	4 40m	$3\,78 \times 10^{-3}$	4 72		α	Po
radium B	RaB	214	82	26 8m	38 7m	$4\,31 \times 10^{-4}$		890	β	Pb
radium C	RaC	214	83	19 7m	38 5m	$5\,86 \times 10^{-4}$	4 1	50	α β	Bi
radium C′	RaC′	214	84	ca 10^{-6}s	10^{-6}s	10^{6}	6 96		α	Po
radium C″	RaC″	210	81	1 32m	1 9m	$8\,7 \times 10^{-3}$			β	Tl
radium D	RaD	210	82	22 yr	31 7 yr	$1\,0 \times 10^{-9}$		5500	β	Pb
radium E	RaE	210	83	4 9d	7 07d	$1\,63 \times 10^{-6}$		45 5	β	Bi
radium F	RaF	210	84	140d	202d	$5\,73 \times 10^{-8}$	3 87		α	Po
radium G	RaG	206	82	∞	∞	0				Pb
Actinium family										
actinium uranium	AcU			ca 10^{8} to 10^{9} yr	?	?				U?
uranium XY	See uranium family									Th
protactinium	Pa	231	91	$3\,2 \times 10^{4}$ yr	$4\,6 \times 10^{4}$ yr	$6\,86 \times 10^{-13}$	3 67	126	α	Pa
actinium	Ac	227	89	13 5 yr	19 4 yr	$1\,63 \times 10^{-9}$		?	β	Ac
radioactinium	RdAc	227	90	18 9d	27 3d	$4\,24 \times 10^{-7}$	4 68	175	α	Th
actinium X	AcX	223	88	11 2d	16 2d	$7\,14 \times 10^{-7}$	4 37	?	α	Ra
actinon	An	219	86	3 92s	5 66s	0 177	5 79		α	Em
actinium A	AcA	215	84	$2\,10^{-3}$s	0 00288s	347	6 58		α	Po
actinium B	AcB	211	82	36m	51 9m	$3\,21 \times 10^{-4}$		1000	β	Pb
actinium C	AcC	211	83	2 16m	3 12m	$5\,35 \times 10^{-3}$	(5 51)	} 29	α, β	Bi
actinium C′	AcC′	211	84	ca $5\,1^{-3}$s	ca 10^{-3}s	ca 14 0	(6 5?)		α	Po
actinium C″	AcC″	207	81	4 76m	6 87m	$2\,43 \times 10^{-3}$			β	Tl
actinium D	AcD	207	82	∞	∞	0				Pb
Thorium family										
thorium	Th	232	90	$1\,8 \times 10^{10}$ yr	$2\,5 \times 10^{10}$ yr	$1\,2 \times 10^{-18}$			α	Th
mesothorium I	$MsTh_1$	228	88	6 7 yr	9 7 yr	$3\,26 \times 10^{-9}$		?	β	Ra
mesothorium 2	$MsTh_2$	228	89	6 14h	8 84h	$3\,14 \times 10^{-5}$		40	β	Ac
radiothorium	RdTh	228	90	1 90 yr	2 74 yr	$1\,16 \times 10^{-8}$		420	α	Th
thorium X	ThX	224	88	3 64d	5 25d	$2\,20 \times 10^{-6}$			α	Ra
thoron	Tn	230	86	54 5s	78 7s	0 0127			α	Em
thorium A	ThA	216	84	0 14s	0 20s	4 95			α	Po
thorium B	ThB	212	82	10 6h	15 3h	$1\,82 \times 10^{-5}$		153	β	Pb
thorium C	ThC	212	83	60 5m	87 3m	$1\,91 \times 10^{-4}$		14 4	α β	Bi
thorium C′	ThC′	212	84	10^{-6}s	10^{-6}s ?	10^{6}(?)			α	Po
thorium C″	ThC″	208	81	3 1m	4 47m	$3\,73 \times 10^{-3}$		21 6	β	Tl
thorium D	ThD	208	82	∞	∞	0				Pb

* The names symbols and constants are those preferred by the "International Radium-Standards Commission *J A Chem Soc*, 1931 **53**, 2437

(1), (2) Other synonyms are *Brevium*, Bv for UX_2, *emanation*, Em or *niton*, Nt, for the isotopes Rn, Ac, and T *uranium-lead*, Pb^{206}, for RaG, *actinium-lead*, Pb^{207}, for AcD, *thorium lead*, Pb^{208}, for ThD, *polonium* Po, for RaF al the symbols *RaAc* for RdAc and *RaTh* for RdT

(3) Proton number, or isotopic weight, is the number of hydrogen nuclei

(4) Atomic number is the charge on the kernel, or the number of electrons

(5) Half period, T is the time in which the quantity of radioactive substance is reduced to one half yr = yea d = day, h = hour, m = minute, s = second

(6) Average life, τ, is the average life of radioactive atoms

(7) Decay constant, λ, is given in seconds, $\tau = 1/\lambda$ 1 Year = $3\,155693 \times 10^{7}$ seconds

(8) Range in cm of the radiations in air at 15°C 760 mm

(9) Absorption coefficient μ in aluminum the thickness of which is measured in cm

(10) Rays or type of decay

may always be detected by its radioactivity **r substance** A substance that contains a radioactive element **r units** See *radium units*

radioactivity The phenomenon of spontaneous disintegration of elements accompanied by the emission of rays It is shown usually by elements of atomic weight higher than lead, and is not affected by chemical or physical influences **artificial-** Induced r **induced-** Artificial-, synthetic r A temporary r caused in an element of lower atomic number than lead by bombardment with particles Cf *radioelements, nuclear reactions, radiosodium* **supra-** The type of r characteristic of hypothetical elements with atomic numbers higher than 92 Cf *transuranium, hypon* **synthetic-** Induced

radiobiology A branch of science that studies the effects of radiations, especially of light, on living organisms

radiochemistry A branch of science dealing with radioactive elements and their reactions Cf *nuclear chemistry*

radioelements (1) The elements of atomic numbers, 82 to 92, lead to uranium Other elements however, may be slightly radioactive (as potassium) (2) Synthetic or artificial r An element of low atomic number which is made temporarily radioactive by exposure to high velocity protons, deuterons, neutrons or alpha-particles, as,

$$_5B^{10} + {}_2He^4 \rightarrow {}_0n' + {}_7N^{13} \text{ (radio nitrogen)}$$
$$_{12}Mg^{24} + {}_2He^4 \rightarrow {}_0n' + {}_{14}Si^{27} \text{ (radio silicon)}$$
$$_{13}Al^{27} + {}_2He^4 \rightarrow {}_0n' + {}_{15}P^{30} \text{ (radio phosphorus)}$$

In each case the r formed is short-lived and breaks up

$$raN \text{ or } {}_7N^{13} \rightarrow {}_6C^{13} + e^+$$
$$raSi \text{ or } {}_{14}Si^{27} \rightarrow {}_{13}Al^{27} + e^+$$
$$raP \text{ or } {}_{15}P^{30} \rightarrow {}_{14}Si^{30} + e^+$$

Cf *nuclear reaction, proton bombardment, radiosodium*

RADIOELEMENTS

Production (1)	Radio-element (2)	Half-life (3)	Energy (4)	End-product (5)
Positron emitters = (PE)				
$\alpha + {}_3Li^6$	$_5B^9$	1 m	0 3	$_4Be^9$
$d + {}_5B^{10}$	$_6C^{11}$	21 m	1 3	$_5B^{11}$
$p + {}_6C^{12}$, $d + {}_6C^{13}$	$_7N^{13}$	10 3m	1 25	$_6C^{13}$
$d + {}_7N^{14}$	$_8O^{15}$	2 1m	1 7	$_7N^{15}$
$d + {}_8O^{16}$, $\alpha + {}_7N^{14}$	$_9F^{17}$	1 2s	2 1	$_8O^{17}$
$\alpha + {}_9F^{19}$	$_{11}Na^{22}$			$_{10}Ne^{22}$
$\alpha + {}_{12}Mg^{24}$	$_{14}Si^{27}$	14 5m		$_{13}Al^{27}$
$\alpha + {}_{13}Al^{27}$	$_{15}P^{30}$	3 2m	3	$_{14}Si^{30}$
Electron emitters = (EE)				
$d + {}_3Li^7$	$_3Li^8$	0 5s	10	$_4Be^8$
$\alpha + {}_3Li^7$ d + $_4Be^9$	$_4Be^{10}$	~10 yrs	0 3	$_5B^{10}$
$d + {}_5B^{11}$	$_5B^{12}$	0 02s	11	$_6C^{12}$
$d + {}_6C^{13}$, $n + {}_7N^{14}$	$_6C^{14}$		1	$_7N^{14}$
$d + {}_7N^{15}$ n + $_9F^{19}$	$_7N^{16}$	10s	6	$_8O^{16}$
$n + {}_9F^{19}$	$_8O^{19}$	40s		$_9F^{19}$
$d + {}_9F^{19}$ n + $_{11}Na^{23}$	$_9F^{20}$	12s	5	$_{10}Ne^{20}$
$n + {}_{12}Mg^{26}$	$_{10}Ne^{23}$	38s		$_{11}Na^{23}$
$d + {}_{11}Na^{23}$ n + $_{13}Al^{27}$	$_{11}Na^{24}$	15 hr	1 7	$_{12}Mg^{24}$
$n + {}_{12}Mg^{26}$	$_{12}Mg^{27}$	10m	0 6	$_{13}Al^{27}$
n d + $_{13}Al^{27}$ α + $_{12}Mg^{25}$	$_{13}Al^{28}$	2 3m	3 3	$_{14}Si^{28}$
n, d + $_{14}Si^{30}$, n + $_{15}P^{31}$	$_{14}Si^{31}$	2 4 hr	1 85	$_{15}P^{31}$
$n + {}_{16}S^{32}$ d + $_{15}P^{31}$	$_{15}P^{32}$	15d	1 7	$_{16}S^{32}$
$n + {}_{17}Cl^{35}$	$_{17}Cl^{36}$	50m	2	$_{18}A^{36}$

(1) The general form of production is by bombardment with

p, protons $_1H^1 + {}_aN^m = {}_{(a+1)}N^{(m+1)}$ (PE)

d, deuterons $_1H^2 + {}_aN^m = {}_0n^1 + {}_{(a+1)}N^{(m+1)}$ (PE)

$_1H^2 + {}_aN^m = {}_1H^1 + {}_aN^{(m+1)}$ (EE)

n, neutrons $_0n^1 + {}_aN^m = {}_1H^1 + {}_{(a-1)}N^m$ or $_2He^4 + {}_{(a-2)}N^{(m-3)}$ (EE)

α, alpha-particles $_2He^4 + {}_aN^m = {}_0N^1 + {}_{(a+2)}N^{(m+3)}$ (PE)

$_2He^4 + {}_aN^m = {}_1H^1 + {}_{(a+1)}N^{(m+3)}$ (EE)

(2) The radioelement of short life is either a (PE) = *positron emitter*, and changes to an element of next lower atomic number $_aN^m \rightarrow {}_{(a-1)}N^m + e^+$, or an (EE) = *electron emitter*, and changes to an element of next higher atomic number $_aN^m \rightarrow {}_{(a+1)}N^m + e^-$

(3) Half-life, in s -seconds, m -minutes, hr -hours, d -days, yr -years

(4) Maximum energy, in MEV

(5) The final and stable end-product

radiogenic Produced by radioactive action, as, uranium lead

radiogram (1) Rontgenogram (2) Laue pattern (3) Skiagraph

radiograph Röntgenogram They have been divided into *exographs* (taken with x-rays), and *gammagraphs* (taken with γ-rays)

radiography Skiagraphy Photography with x-rays **mass-** The routine X-ray examination of large numbers of persons by the reproduction of an x-ray image on a fluorescent screen, on a much-reduced scale, on a photographic film, used in tuberculosis studies

radiolead (1) The natural radioactive mixture of lead isotopes in minerals (2) Radium G, PbRa, RaΩ or Pb^{206} A radioactive disintegration-product of radium F and an isotope of lead

radiolite A variety of natrolite

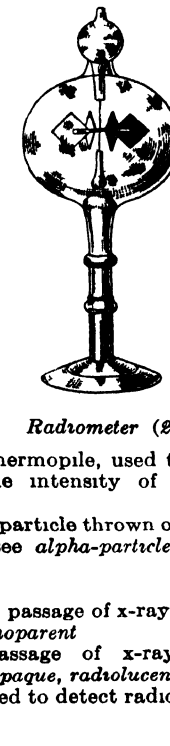
radiology A branch of science that studies radioactivity and radioactive elements

radiolucent Offering some resistance to the passage of x-rays Cf *radiopaque, radioparent*

radioluminescence Fluorescence caused by radioactive rays striking an obstacle or screen treated with a suitable substance

radiometallography The examination of the structure of metals, especially steel, by photography with radioactive substances and fluorescent screens

radiometer (1) An instrument for measuring the penetrating power of radioactive rays (2) An apparatus which measures the mechanical effect of light, q v (3) A bolometer (4) A thermocouple Cf *radiator*



Radiometer (2)

radiomicrometer A delicate thermopile, used to detect small changes in the intensity of a radiation

radion An obsolete term for a particle thrown off by a radioactive element (see *alpha-particles, beta-particles*) Cf *radon*

radionitrogen See *nitrogen*

radiopaque Impervious to the passage of x-rays Cf *opaque, radiolucent, radioparent*

radioparent Allowing the passage of x-rays freely Cf *transparent, radiopaque, radiolucent*

radioscope An electroscope used to detect radioactive substances

radiosodium See *sodium*

radiostol Viosterol

radiotellurium Polonium

radiotherapy. Radium therapy

radiothor. Radioactive indicator

radiothorium RaTh A radioactive element, atomic number 90, disintegration-product of mesothorium-2 It is an isotope of thorium, and disintegrates to thorium-x

radiovision The transmission of pictures by wireless telegraphy Cf *television, teleopsis*

radish The root of *Raphanus sativus*, a Cruciferae, used as a vegetable Its coloring matter is an indicator

radium Ra = 226 05 A radioactive element, atomic number 88, a disintegration-product of ionium It is a homotope of barium, and isotope of thorium X, actinium X and mesothorium 1, which disintegrates to radon and helium, and was discovered in 1898 by Dr and Madame Curie It is a gray powder, m 700, decomp by water, and forms a series of salts It is extremely toxic, and deposits in the bones of organisms **RaA, RaB, RaC,** etc See *radioactive elements,* also table of radioactive elements and radium units **r bath water** Water which contains 4 micrograms of radium per 200 cc and is colored with fluorescein used medicinally **r bromide** $RaBr_2$ = 385 8 A colorless crystalline powder, soluble in water, alcohol or ether (sublimes, 900) Used medicinally, usually in admixture with $BaBr_2$ **r carbonate** $RaCO_3$ = 286 0 A white amorphous powder, insoluble in water, decomposed by acids It is marketed as a mixture with $BaCO_3$ **r chloride** $RaCl_2$ = 296 5 A yellowish crystalline powder, m 1650, soluble in water Used medicinally as a mixture with $BaCl_2$ **r compress** An oiled silk bag, which contains finely-ground radium ore and barium sulfate, used in the treatment of rheumatism and neuralgia **r drinking water** A distilled water which contains 1 microgram radium in 30 cc, used medicinally **r emanation** Radon **r F** Polonium **r G** Radio-lead **r sulfate** $RaSO_4$ = 322 0 A white powder, insoluble in water or acids It is marketed as a mixture with $BaSO_4$ **r therapy** Curie therapy The use of radioactive substances in the treatment of disease It is used either externally or internally **r units** The amount of radium, or its activity, is usually expressed in (1) Micrograms of radium (0 001 mg) (2) Curies, (q v) millicuries, and microcuries, the emanation from 1 gram, 1 milligram, and 1 microgram of radium, respectively (3) Mache units (q v), a concentration of radium emanation corresponding with $\frac{1}{2500}$ microcurie Cf *urane*

radius Any line from the center to the circumference of a circle

$$\text{radius} = \tfrac{1}{2}\ \text{diameter} = \text{circumference}/\pi$$

radix The Latin term for root **r sarsale** Sarsaparilla

radon Rn = 222 Niton, radium emanation The element of atomic number 86, the last member of the series of noble or inert gases It occurs in radioactive minerals, and is produced as a result of radioactive disintegration Discovered by Mme Curie in 1898 (niton), and isolated by Dorn in 1901 It has a life of 5 5 days, and liquefies at −153°C to a colorless liquid, b −65°C The liquid solidifies at −71°C, d 9 97, and glows with a blue light which turns orange at lower temperatures

raF Radiofluorine

RaF Radium F

raffia Raphia

raffinase An enzyme that hydrolyzes raffinose and appears to be identical with invertase Cf *melibiase*

raffinate A refined oil produced in the fractionation of crude lubricating oils

raffinose $C_{18}H_{32}O_{16}\ 5H_2O$ = 594 4 Melitriose, melitose A carbohydrate derived from sugar beets cottonseed, eucalyptus and other plants, which is hydrolysed to fructose, glucose and galactose Colorless monoclinic needles, d 1 465, m 119, soluble in water or alcohol

RaG Uranium-lead

Ragsky test The toxicological detection of chloroform by the reaction

$$\underset{}{6CHCl_3} \rightarrow \underset{a}{C_6Cl_6} + \underset{b}{3Cl_2} + \underset{c}{6HCl},$$

a is deposited as white needles, *b* detected by iodide-starch paper and *c* absorbed by $AgNO_3$ solution

ragweed The dried leaves and flowers of *Ambrosia artemisiaefolia,* used as the fluid extract, as an astringent and styptic

ragwort Senecio

raies ultimes Ultimate lines The strongest lines of a spectrum, those most easily and most persistently obtained from a given element, and used to identify it

raised growth A thick and heavy bacterial growth with abrupt or terraced edges

raisin The dried ripe fruit of *Vitis vinifera* (grapes), a Vitaceae, used as food **r seed oil** Grape seed oil A yellow oil expressed from ground r seeds, d 0 92–0 93 Used in foods, as a lubricant, and in soap making

ralstonite The mineral, $3Al(OH,F)_3,(Na_2,Mg)F_2\ 2H_2O$

Raman, Sir Chandrasekhara Venkata 1888– An Indian physicist and Nobel Prize winner **R effect** The scattering of monochromatic light accompanied by a change in wavelength, due to the absorption of energy quanta by the scattering medium Cf *scattering, luminescence* **R lines** The shift of wavelengths of spectrum lines of scattered light from a medium illuminated with monochromatic light They indicate molecular structure and the type of atomic bonds **R spectrum** The characteristic line patterns produced on a photograph taken at right angles through a substance illuminated with a quartz mercury lamp

RAMAN LINES

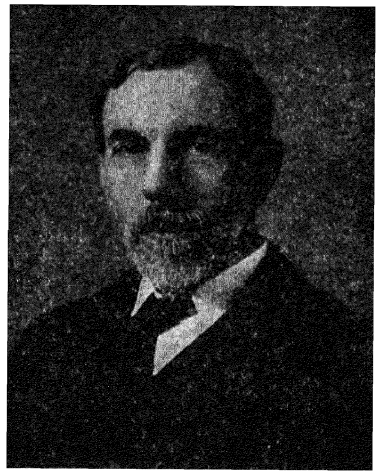
Wavelength shift in cm^{-1}	Bond	Type of compound
900	C—C	paraffins
1374	C=C	olefines
600, 1700	C=O	fatty acids
1050, 1250, 1360	C—O	primary alcohols
3400	O—H	water or methanol
3300	N—H	amines
1050	C—N	cyanides
739, 657	C=S	thioacids
2573	S—H	mercaptans

ramie. Rhea fiber. The bastfiber from *Boehmeria tenacissima*, a plant of the nettle family. It is used for weaving grass-cloth or Canton linen, and consists of almost pure cellulose. **false-** China grass from *B. nivea*.

ramigenic acid. $C_{16}H_{20}O_6$ = 308.2. An acid produced by the mould fungus, *Penicillium Charlesii*.

rammelsbergite. A native nickel arsenide, $NiAs_2$.

Ramsay, Sir William. 1852–1916. A British chemist who discovered the noble gases and



Sir William Ramsay.

some radioactive elements. **R.-Shields equation.** A relation which indicates the degree of association of molecules:

$$\gamma(MV)^{\frac{2}{3}} = K(t_c - t - 6)$$

where γ is the surface tension, MV the molecular volume, t_c the critical temperature, t the temperature of the liquid; K is 2.12 ergs per degree for a normal liquid. Cf. *Morgan* equation. **R.-Young equation.** An expression of the relation existing between the pressure, p, and absolute temperature, T, of a gas or homogeneous liquid, the volume being constant: $p = (kT - c)$, where k and c are constants. **R. and Young law.** The ratio of the boiling points of chemically analogous compounds at the same pressure is independent of the pressure: $A/B = A'/B'$, where A is the boiling point of compound a, B the boiling point of b at pressure x, A′ the boiling point of a, and B′ the boiling point of b at pressure y, hence $a_x/b_x = a_y/b_y$.

Ramsden ocular. See *ocular*.

rancid. Having the peculiar tainted smell of oily substances which have begun to spoil. Rank and sour from chemical decomposition; as rancid butter.

rancidity. A condition of partly-decomposed fats or oils, due to the formation of free fatty acids.

Raney's alloy. An alloy (Ni 30, Al 70) used in place of Devarda's alloy (q.v.) for the determination of nitrates by reduction to ammonia. **R. catalyst,** Ni_2H.(?) R. nickel. A highly-active, finely-divided nickel catalyst, prepared by dissolving the Al out of R. alloy by alkali; used for hydrogenating organic compounds.

Rankine scale. A thermometer scale based on absolute zero of the Fahrenheit scale; −460°F = 0°R; or $(t_F + 460) = x°R$. It corresponds with the Kelvin scale based on the Centigrade scale.

rankinite. $3CaO.2SiO_2$. A natural calcium silicate from Ireland; it is a constituent of high-lime blast furnace slags.

Ranunculaceae. The crowfoot family, a group of herbaceous or shrubby plants with an acrid juice. Some of the species are:

Cimicifuga racemosa	black cohosh
Hydrastis canadensis	golden seal
Actaea alba	white cohosh
Actea spicata	helleborin
Coptis trifolia	gold thread
Helleborus niger	black hellebore
Helleborus viridis	green hellebore
Xanthorrhiza apiifolia	yellow root
Anemone pulsatilla	pasque flower
Adonis vernalis	false hellebore
Ranunculus bulbosus	butter cup
Delphinium staphisagria	stavesacre
Delphinium consolida	larkspur seeds
Nigella damascena	nigella
Nigella sativa	nigella
Aconitum napellus	monkshood
Anemone hepatica	liverwort
Paeonia officinalis	peony

Cf. *aconite alkaloids, Clematis, Delphinium, macrocarpine, thalicitrine.*

ranunculine. An alkaloid from *Ranuncula* species. It is a cardiac poison.

Raoult, François Marie. 1830–1901. A French chemist noted for his generalizations in physical chemistry. **R.'s law.** (Cf. *Blagden's Law, Coppet's law.*) The lowering of the freezing point or of the vapor pressure of a solution is proportional to the amount of substance dissolved in the solution:

$$\frac{p_0 - p}{p_0} = \frac{n}{N + n} = \frac{aM}{bm},$$

where p is the vapor pressure of the solution; p_0, that of the pure solvent; n, the number of molecules of dissolved substance; N, the number of molecules of solvent; a, the weight in grams of the solute of molecular weight, m; b, the weight in grams of the solvent of molecular weight, M. It is thus possible to determine the molecular weight of a substance from the lowering of the vapor-pressure of its solution.

*ra***P.** Radiophosphorus.

rape seed oil. Colza oil, rape oil. A brown, viscous, fixed oil expressed from the seeds of rape, *Brassica napus*, a Cruciferae. It has an unpleasant odor, $d_{.25°}$0.906–0.910, solidifies at −2 to −10°C, m.20, soluble in alcohol, ether or chloroform. Used as a lubricant, in the heat treatment of steel, and in the manufacture of rubber substitutes.

raphia. Raffia. A fiber peeled from the leaves of *Raphia pedunculata*, a palm of Madagascar; used for making mats and basketry.

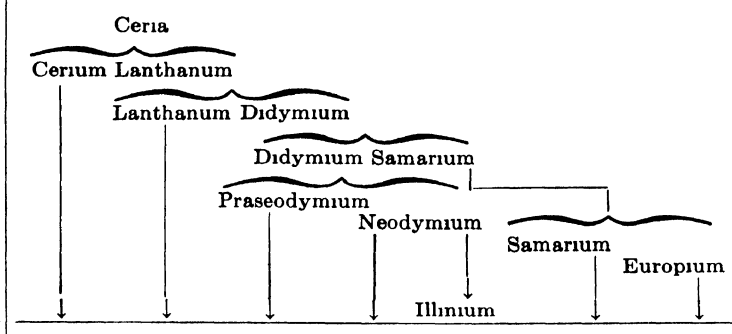
raphides. Small crystals of calcium oxalate in plants.

rapic acid. Rapinic acid.

rapinic acid. $C_{18}H_{34}O_2$ = 282.27. An unsaturated, monobasic acid and isomer of oleic acid, probably identical with petroselinic acid, in rape seed oil.

rare. Not common. **r. earths.** (1) The oxides of the r. earth metals; as, ceria, holmia. (2)

1 RARE EARTH METALS OF THE CERIA GROUP



In a wider sense, the oxides of Sc, Y, La and even of Hf, Zr, Th **r earth metals** The metallic elements, atomic numbers 57 to 71, of the periodic system They are grouped in two classes, the ceria earths and yttria or gadolinite earths, and are closely similar in physical and chemical properties, forming one group in the periodic system The rare earth group differs from all other groups of the periodic system because its elements have consecutive atomic numbers (See tables) **r e minerals** The rare earth metals generally occur associated with one another as phosphates and silicates, *e g*,

zircon	$ZrSiO_4$
thorite	$ThSiO_4$
monazite	$CePO_4$
gadolinite	$Be_2FeYt_2Si_2O_{10}$
cerite	$H_3(Ca,Fe)Ce_3Si_3O_{13}$
orthite	$AlOHCa_2(Al,Fe,Ce)_2(SiO_4)_3$

Each of these minerals is always accompanied by a number of the other rare earths Cf *bastnasite, fergusonite, fluocerite, rowlandite, rutherfordite, samarskite, sipylite, xenotime, yttriotantalite*

rare gases The noble gases (He, Ne, A, Kr, and Xe)

rarefaction The act of making less dense, either by increasing the volume without changing the amount of gas, or by decreasing the amount of gas in a certain volume, as, with a vacuum pump

rarefied Describing a gas at lower pressure than atmospheric

rasmosin. A resin from the root of *Cimicifuga racemosa*, a Ranunculaceae

rasorite $Na_2B_4O_7\,4H_2O$ Kernite A hydrated sodium borate found native in California Colorless monoclinic crystals, d 1 908, hardness 2 5

raspberries The fresh ripe fruits of *Rubus idaeus*, a Rosaceae, used as food and in pharmaceutical preparations

raspberry leaves The dried leaves of *Rubus* species, used as the fluid extract, as an astringent

rat White rat, *Rattus norvegicus*, used in animal experiments **r. unit** (1) The minimum quantity of pituitary hormone which will cause the formation of one or more corpora lutea within 96–100 hrs, when injected subcutaneously in six doses, twice daily for three days, in female white r 30 days old (2) A method of expressing the vitamin A potency of a substance in terms of its therapeutic effect on rats

ratafia A cordial prepared by crushing and steeping fruit kernels

ratany Krameria

ratholite Pectolite

rate The relative degree of speed **r of decomposition, r of formation** The velocity of a chemical, reaction expressed in mols per second per cc or in mols per hour per liter

ratio Proportion

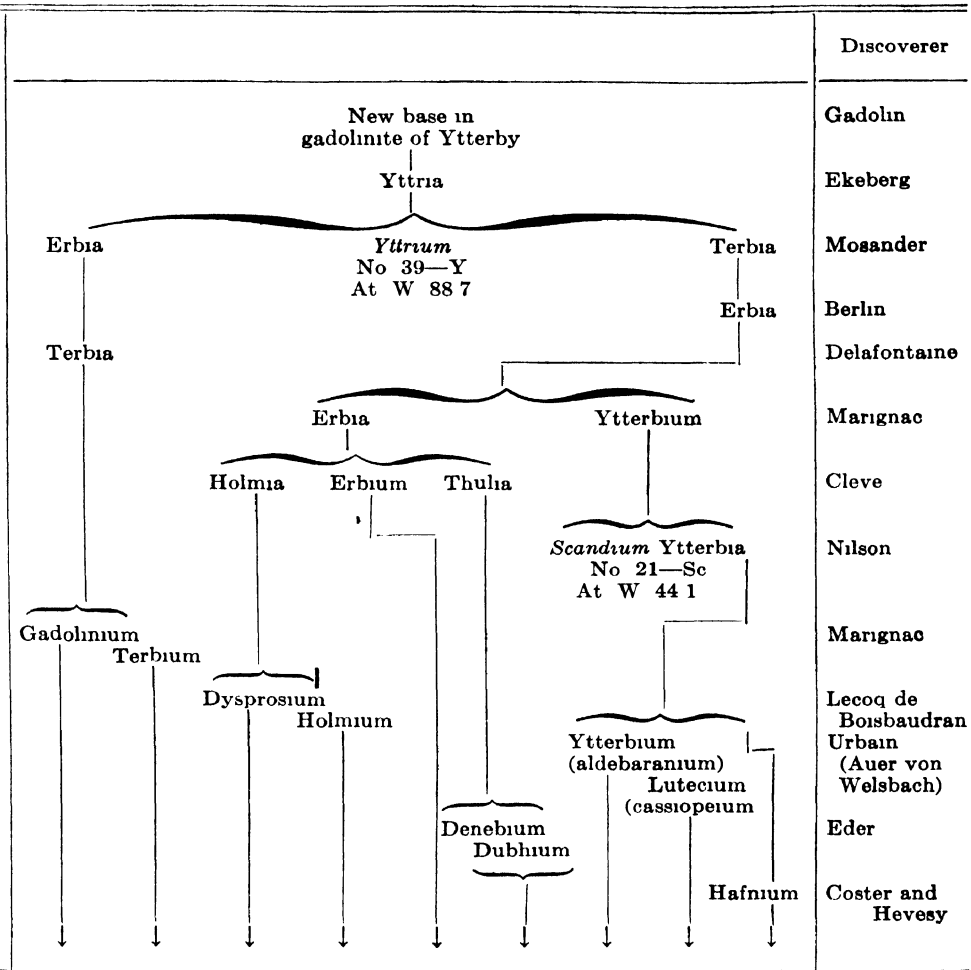
ration The daily allowance of food and drink

rational Based on reasoning and not on direct experience **r analysis** The expression of analytical results in such a way that the method of combination of the elements is indicated (*e g*, water analysis), as compared with ultimate analysis in which their quantities are returned Thus, clay would be expressed in terms of calcium silicate, rather than as Ca, Si and O Cf *ultimate* **r formula** A combination of chemical symbols that indicates the way in which the atoms are probably linked in the molecule It is less elaborate than the structural formula, and more definite than the empirical formula In a rational formula, such as, $Fe_2(SO_4)_3$, NH_4OH, C_2H_5OH, CH_3COOH, the atoms are grouped into one or more radicals **r units** See *ultimate units*

rattlesnake root Senega **r venom** The poisonous proteins from the fangs of *Crotalus* species (Antidote external application of potassium permanganate)

Raulin's solution. A culture fluid for fungi, molds, etc consisting of 70 gm sucrose, 4 gm tartaric acid, 4 gm ammonium nitrate, 0 6 gm ammonium phosphate, 0 25 gm ammonium sulfate, 0 07 gm potassium silicate, 0 6 gm potassium carbonate, 0 4 gm magnesium

2 RARE EARTH METALS OF THE YTTRIA GROUP

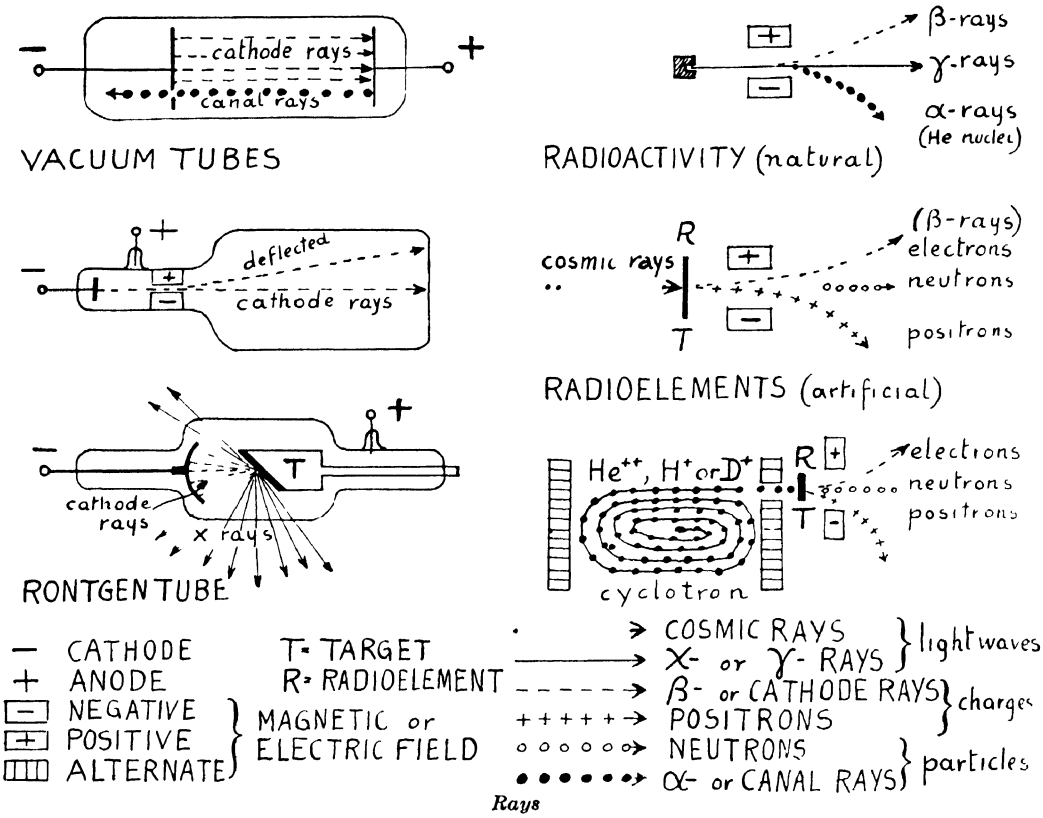


carbonate 0 07 gm zinc sulfate and 0 08 gm ferric sulfate per liter

rauwolfine $C_{20}H_{26}N_2O_3\ 2\frac{1}{2}H_2O$ = 387 2 An alkaloid, decomp 235, from the bark of *Rauwolfia caffra*, an Apocynaceae

raw Crude or unfinished **r material** A material from which useful substances or compounds can be made **r ore** An ore in the state in which it is won

ray A pencil or beam of light, heat, or rapidly-moving particles Cf *radiation*, and illustration **absorbed-** A light ray transformed into heat (molecular motion) by passing through matter **actinic-** Chemically-active light, especially ultra-violet light **alpha-** Alpha-particles Positively-charged helium nuclei moving at great velocity and produced by the disintegration of radioactive elements They are similar to canal rays **Becquerel-** The x-rays produced as a result of the disintegration of radioactive elements, they affect a photographic plate **beta-** Negatively-charged electrons, moving at great velocity and produced by the disintegration of radioactive elements They are identical with cathode rays **Blondlot-n-*Rays*** **canal-** Positively-charged particles similar to alpha-particles, but produced by an electric discharge through an evacuated tube having a perforated cathode through which the particles pass **cathode-** Negatively-charged particles or electrons, moving at great velocity at right angles to the cathode of a vacuum tube and causing the emission of x-rays whenever they strike a solid They are similar to the beta-rays of radioactive substances **chemical-** Actinic- **cosmic-** Millikan rays, ultra-gamma or ultra-x-rays Radiations of extremely short wave lengths coming from all directions of space toward the earth's surface **extraordinary-** See *ordinary-* **gamma-** The x-rays produced by the impact of the beta-rays emitted by radioactive elements against a solid **hard-** X-rays of short wavelength, they have greater penetrating powers than the



Rays

showing methods of production and relationships

soft- heat- See *infrared-* **infrared-** The radiations beyond the red portion of the visible spectrum, they have greater wave lengths than this portion, and are heat radiations **K-** See *K-radiations* **L-** See *L-radiations* **Lenard-** Residual cathode rays that pass from the vacuum tube into the atmosphere through specially-prepared windows of thin metal foils **M-** See *M-radiations* **Millikan-** See *cosmic-* **molecular-** See *molecular rays* **n- Blondlot** rays A non-luminous radiation emitted from certain flames, that produces fluorescence when it strikes certain substances **negative-** Cathode- or beta- **od-** The radiations of living organisms Cf *scotography* **ordinary-** See *ordinary* **phonic-** Sound waves **photic-** Visible light rays **positive-** Canal- and alpha- **Röntgen-** X-rays **secondary-** Radiation produced after a primary ray strikes matter **soft-** Any x-ray of long wavelength that has low penetrating powers **ultimate-** See *rates ultimes* **ultragamma-** See *cosmic r* **ultraviolet-** The radiations from the portion beyond the violet end of the visible spectrum, they are of shorter wavelength than visible violet and produce fluorescence **u v -** Ultraviolet- **w-** R between u v - and x- **x-** Rontgen **rays** A form of non-luminous radiation, usually produced by cathode rays striking a solid It is assumed to be the ether disturbance caused by the bombardment of the negative electrons when they collide with the molecules of the solid substance Cf *x-rays*

Ray, Sir Prafuda Chandra 1861– A Hindu chemist noted for historical research

Rayleigh, (John, William Strutt) Lord 1842–1919 An English physicist, noted for the discovery of the noble gases, and determinations of the densities of gases **R , Lord Robert John** 1875– An English physicist noted for his work on radioactivity and optics

rayolanda Trade name for a chemically-modified viscose rayon

rayon Artificial silk or any artificial substance whose chief ingredient is cellulose or one of its derivatives Thread, yarn or fiber, made from cellulose derived (*e g* , from wood or cotton) chemically treated Four main types (1) **acetate r** The acetic ester of cellulose It is prepared by treating the cellulose of cotton or wood pulp with acetic anhydride, acetic acid and concentrated sulfuric acid in presence of a catalyst, precipitating with water and dissolving in acetone, from which it is spun Trade names are celanese and lustron (2) **cuprammonium r** (glanzstoff or Pauly) is made by dissolving cotton or wood pulp in an ammoniacal copper solution, which is ejected through fine orifices into a setting bath of dilute sulfuric acid (3) **nitrocellulose r** (Chardonnet) is prepared by treating cotton with nitric and sulfuric acid, dissolving the resulting trinitrocellulose in alcohol and ether (collodion solution) and ejecting through fine nozzles into water or warm air The inflammable filaments are in turn denitrated by treatment with sodium hydrosulfide (4) **viscose r** , the commonest process of making r involves soaking bleached spruce pulp or cotton linters in 18 % caustic soda solution, treating the soda cellulose

with carbon disulfide (xanthation) dissolving in caustic soda (viscose), and finally forcing the viscose through fine outlets into a setting and bleaching bath The total World output of rayon in 1940 was 450,000 tons, the U S and Japan were the biggest single producers

razor stone Novaculite

Rb The symbol for rubidium

rd An abbreviation for rod

Re The symbol for rhenium

Ré Abbreviation for Réaumur

react To enter into a chemical combination

reactants The original molecules that act upon one another to form a new set of molecules (resultants)

reacting Undergoing a reaction **r weight** Equivalent weight

reaction. (1) That force which tends to oppose a given force (Newton's Laws) (2) The acidity (q v) or alkalinity of a solution (3) Any chemical change, or the transformation of one or more molecules (reactants) into other kinds of molecules (resultants) Reactions may be grouped into (1) *synthetic* (combination and addition), (2) *analytic* (decomposition and dissociation), (3) *metathetic* (an interaction of molecules as neutralization, precipitation, substitution, displacement) Modern theory places r in two types

I **Proton-** or *acid/base-*, where a hydrogen ion is either liberated or bound

$$A \leftrightharpoons B + H^+$$

This equilibrium is maintained by buffers (q v), and measured by p_H-values Cf *displacement series*

II **Electron-** or *oxidation/reduction-*, where an electron is transferred from one atom to the other

$$A \leftrightharpoons B + e \qquad \text{or} \qquad H + e$$

This equilibrium is maintained by poisers (q v), and measured by r_H-values Cf *redox series* Another division is (A) reactions in which there is no change of valence of the participating atoms, and (B) reactions that involve a change of valence and are generally spoken of as oxidation and reduction or electronation reactions The general types of reactions are

A Reactions involving no oxidation and reduction

1 Addition

(molecules combine to form a more complex molecule $K_2O + SO_3 = K_2SO_4$)

2 Decomposition

(molecules break apart into simple molecules $NH_4Cl = NH_3 + HCl$)

3 Metathesis

(interaction between molecules $NaCl + AgNO_3 = AgCl + NaNO_3$)

4 Neutralization

(the interaction of an acid and base to form a salt and water

$$M(OH) + HN = MN + HOH,$$

M is a metal, and N a nonmetal or acid radical)

5 Hydrolysis

(the action of water on a compound, generally the reverse reaction of neutralization,

$$HOH + MN = MOH + HN)$$

B Reactions involving oxidation and reduction (electronation) There is an increase in the valence number of one element, and a corresponding decrease in the valence number of another element, or one or more electrons pass from one atom to the other

1 Combination

(element molecules unite and form a compound, $H_2 + Cl_2 = 2HCl$)

2 Dissociation

(a compound molecule splits into element molecules $2HI = H_2 + I_2$)

3 Displacement

(an element molecule interacts with a compound molecule, $Fe + CuSO_4 = Cu + FeSO_4$)

4 Substitution

(an element molecule interacts with a compound molecule $Cl_2 + CH_4 = CH_3Cl + HCl$)

5 Restitution

(the reverse reaction of substitution $2PbO + PbS = 3Pb = SO_2$)

6 General oxidation and reduction

(interaction among molecules in which some atoms are oxidized and others reduced

$$4HCl + MnO_2 = Cl_2 + MnCl_2 + 2H_2O)$$

C Organic reactions are similar to inorganic reactions According to Falk they take place by the intermediate formation of an addition compound, and if the reaction is catalytic, the catalyst is one of the components of the addition compound

(a) The majority are metathetical reactions of the type

$$BX + HA = BA + HX,$$

in which B is a base, metal or hydrogen, X the hydroxyl radical or a halogen, A a nonmetal or acid group Thus (a) neutralization

$$BOH + HA = BA + H_2O$$

(b) Friedel-Crafts reaction

$$RX + HPh = RPh + HX$$

where X is either OH or Cl, and the catalyst either $AlCl_3$, $ZnCl_2$ H_2SO_4 or HCl

(c) Aldol condensation

$$R\,CHO + H_2CA_2 = R\,CH\,CA_2 + H\,O,$$

where A is a negative group on the alpha-carbon, and the catalyst is either zinc chloride, hydrochloric acid or an alkali

(d) Esterification

$$ROH + HA = RA + H_2O,$$

where R is an alkyl or aryl radical, and the catalyst either zinc chloride, sulfuric acid or hydrochloric acid

(e) Etherification

$$ROH + HOR' = ROR' + H_2O$$

(f) Amide formation

$$AcOH + HNH_2 = AcNH_2 + HCl$$

where Ac is an acyl radical, and OH can be replaced by Cl, or the NH_2 group by an NR_2 group

(g) Amine formation

$$ROH + HNH_2 = RNH_2 + H_2O$$

where R is either an aryl or alkyl radical

(h) Nitrocompound formation

$$NO_2X + HPh = NO_2Ph + HX$$

in which X is either OH, OEt, OSO_3H, or an acyl radical

(i) Nitrosocompound formation

$$NO\,X + HPh = NOPh + HX$$

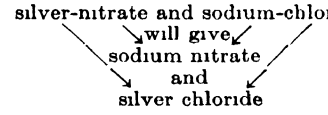
in which X is either OH, Cl or an OR group
(j) Diazotization

$$NO\,X + H\,NHR = ON\,NHR + HX$$

where X is either OH or Cl, and R either an aryl or alkyl radical

acid- A test for the presence of hydrogen ions or an acid, as, blue litmus turning red **alkaline-** A test for the presence of hydroxyl ions or bases, as, red litmus turning blue **amphoteric-** The reaction of a substance that has both acid and alkaline properties **analytic-** R which break down molecules **analytical-** R used in determining the quantity and/or quality of matter **balanced-** A reversible reaction, which goes to completion in neither direction **bimolecular-** A reaction of the second order **Bunsen-** See *Bunsen* **catalytic-** A reaction whose rate is accelerated by a catalyst Cf *induced-* **chain-** See *chain trigger* **color-** A r involving a change in color **complete-** A chemical change that proceeds to completion, as, the precipitation of an insoluble compound **complex-** Composite r **composite-** A chemical change in which more than one reaction occurs simultaneously **concurrent-** A chemical change that consists of a series of connected reactions that could not occur separately **condensation-** A reaction in which atoms are removed from two or more molecules, the residues combining to form a single molecule **counter-** Reversible reaction **coupled-** A concurrent reaction **diazo-** See *diazo* **endothermic-** A reaction in which heat is consumed **exothermic-** A reaction in which heat is liberated **flame-** See *Bunsen* **group-** A typical reaction of a certain group of elements, as, in qualitative analysis **heat of-** See *heat* **heterogen(e)ous-** A composite r **incomplete-** Balanced r **induced-** A reaction that is accelerated by an inductor or promoter **ionic-** An instantaneous reaction between ions in solution **irreversible-** A reaction that proceeds to completion and cannot be reversed **main-** The principal reaction **metathetical-** A reaction in which there is an exchange of groups **micro-** See *micro* **molecular-** In general, a slow reaction occurring between molecules and not ions **monomolecular-** A reaction of the first order **negative-** The absence of r **neutral-** A r which is neither acid nor basic **nuclear-** See *nuclear* **opposing-** The reverse reaction in a balanced reaction **photo-** See *photo* **positive-** A r which is definite **primary-** The principal or main reaction that occurs in a composite system of reactions **principal-** Primary r **pyrogenic-** See *pyrogenic* **qualitative-** q v **quantitative-** q v **reversible-** An incomplete r A reaction that proceeds under certain conditions from right to left as well as from left to right **secondary-** Subsidiary r **side-** A reaction simultaneous with the principal reaction, and occurring between the same reactants but forming different products **simultaneous-** Side r **staircase-** See *staircase* **subsidiary-** A reaction which occurs between the resultants of a reaction **successive-** A reaction made up of a number of component reactions which occur in succession, the reactants being in turn the resultants of the preceding reaction **sympathetic-** Induced reaction **synthetic-** A reaction in which simple molecules combine to form a more complex molecule **topochemical-** See *topochemistry* **trigger-** q v

r control (1) The factors controlling the speed of a reaction are concentration (amount of substance present) and energy relations (potential energy, electromotive force and free energy) A reaction can be accelerated by (a) *Mechanical* means, by increasing the number of molecules coming in contact with one another, by increasing the surface by subdivision (colloidal state) or mechanical catalysers, increasing the pressure of gases, or in general, increasing the concentration of the reactants and removing the resultants (b) *Thermal* means, by increasing the velocity of the molecules by heating, and, thus, increasing the frequency of molecular collisions and the speed of the reaction (c) *Electrical* means, by electrolysis and electrolytic displacement (d) *Optical* means, by activation, excitation or irradiation (2) Reaction, in the sense of acidity, is controlled by buffer solutions (q v) **r equations** An expression of a chemical change (A) *Graphical* method, a popular illustration of the exchange taking place



(B) *Molecular* method, which indicates the weight relations of the reacting substances

$$AgNO_3 + NaCl = AgCl + NaNO_3$$

(C) *Ionic* method, a generalized statement of the actual change, or representing action as it takes place between ions of dissociated reacting molecules

$$Ag^+ + Cl^- = AgCl$$

r isochore An equation that indicates the relation of temperature to the equilibrium constant (K) at constant volume (or pressure of a gas) $\frac{d(\ln K)}{dT} = -\frac{U}{RT^2}$ (ln K) is the natural logarithm of K at absolute temperature T, U, the decrease in total energy or heat quantity at this temperature, R, the gas constant By integration this decrease in energy can be calculated from the equilibrium constants, K_1 and K_2, at the temperatures, T and T_2, respectively

$$(\ln K_2) - (\ln K_1) = \frac{U}{R}\left(\frac{1}{T_2} - \frac{1}{T_1}\right)$$

The maximum work at any temperature can thence be determined **r isotherm** An equation that indicates the maximum external work or diminution in free energy that can be obtained from a given chemical reaction at constant temperature and volume $A = RT \log K - RT\Sigma v \log C$, where A is the decrease in free energy and $RT\Sigma_v \log C$ represents the concentration (See also *mass action, equilibrium*) It holds for ideal gases only A is a measure of the affinity of the reaction **r law** If a system in equilibrium undergoes a restraint a change tends to take place, which, if it is a possible change, partly annulls the constraint **r**

order A division of reactions into several types

First order, mono- or unimolecular reactions—a reaction in which only one molecule reacts A = one or more products The velocity of such reactions is expressed by

$$\frac{dx}{dt} = k(a - x)$$

where a is the initial amount of substance, x, the amount that has changed after time, t, and k is the velocity constant This expression on integration becomes

$$k = \frac{1}{t} \ln \frac{a}{a - x}, \text{ or } k = \frac{1}{t_2 - t_1} \ln \frac{a - x_1}{a - x_2}$$

when x_1 and x_2 are the amounts that have changed after times t_1 and t_2, respectively

Second order, bi- or di-molecular reactions—reaction in which two molecules undergo a change

2A = one or more products, or
A + B = one or more products

The velocity is expressed by $dx/dt = k(a - x)(b - x)$, which, on integration, becomes

$$k = \frac{1}{(a - b)t} \ln \frac{(a - x)b}{(b - x)a},$$

or $$k(a - b) = \frac{1}{t_2 - t_1} \ln \frac{a - x_2}{b - x_2} - \ln \frac{a - x_1}{b - x_1}$$

However, if a = b, then

$$k = \frac{1}{t} \frac{x}{a(a - x)}$$

Third order, tri- or termolecular reactions—a reaction in which three molecules undergo a change

3A = one or more products
2A + B = one or more products
A + B + C = one or more products

The velocity of these reactions is $dx/dt = k(a - x)(b - x)(c - x)$, and on integration, if a = b = c

$$k = \frac{1}{2t} \left[\frac{1}{(a - x)^2} - \frac{1}{a^2} \right]$$

Fourth order, tetra- or quadrimolecular reactions—a reaction in which four molecules undergo a change

4A =	one or more products	reaction-
3A + B =	one or more products	reaction-
2A + B + C =	one or more products	reaction-
A + B + C + D =	one or more products	reaction-

r promoter Promoter **r. sensitivity** That dilution at which a reaction may be carried out and still give identifiable end-products **r velocity** Velocity constant The time rate at which molecules change or are transformed in a chemical reaction (See *reaction order*)

reactivation The rendering active again of a catalyst or serum which has become inactivated Cf *revivification*

reactivity The capacity to react

reading telescope A one-tube telescope placed below a meter scale, through which the image of the scale in a mirror is read The slightest deflection of the mirror can be determined, and is often used in very delicate measurements, as, sensitive galvanometer measurements

reagent A substance used for the detection or determination of another substance by chemical or microscopical means, especially those substances or their solutions which are used in qualitative or quantitative analysis Reagents may be divided into

1 precipitants—which produce an insoluble compound
2 solvents—which are used to dissolve water-insoluble materials
3 oxidizers—which are used in oxidation
4 reducers—which are used in reduction
5 fluxes—which are used to lower the melting points of substances
6 Colorimetric reagents—which are analogous to 1, but produce coloured soluble compounds

(See also *volumetric solutions, standard solutions, normal solutions*) **r solution** The aqueous solution of a r substance used in the laboratory, usually about 10 % concentration

realgar As_2S_2 Ruby sulfur, red arsenic, red orpiment A red or orange native arsenic disulfide, monoclinic prisms

rearrangement Molecular conversion, migration, or transposition An intramolecular change, or reaction in which the atoms or atomic groups of the molecule redistribute themselves or arrange themselves in a different manner Cf *pinacol, enol-ketone, semidine*

Réaumur, René Antoine Ferchault de 1683–1757 A French natural philosopher, noted chiefly for his invention of a thermometer scale **R degree** °R or °Ré A thermometer scale based upon the freezing point of water = 0°R and the boiling point of water = 80°R, hence, 80°R = 100°C

recalescence An increase in the emission of visible light during the cooling of molten metals, the brighter glow of a molten substance at certain temperatures It is explained by thermally excited electrons falling back to a lower energy level in the atom Cf *luminescence*

recalescent point The temperature at which evolution of heat occurs during the cooling of steel It is lower than the decalescent point (*q v*) by an amount which is a measure of the hysteresis of steel

recarbonize To restore the carbon content of steel after decarbonizing

recarburize Recarbonize

receiver A vessel in which the products of a distillation are collected

receptacle A receiving-vessel

receptors A radical or atom on the surface of the protoplasmic, colloidal molecule that fixes drugs or poisons and thereby renders them effective Compare *Ehrlich side-chain theory*

reciprocal The quotient, r, obtained by dividing unity by a number, n r = 1/n, hence any function or expression so related to another that their product is unity rn = 1 **r ohm** The unit of conductivity, mho, q v **r salt pair** Two salts which may act either as the reactants or resultants of a reaction, as,

$$NaCl + KNO_3 \rightleftharpoons NaNO_3 + KCl$$

reciprocating motion. Motion to and fro in a straight line, like that of the piston of a steam engine.

reciprocity law. Bunsen and Roscoe law.

recoil. Return motion. **r. atom.** The atom of a radioactive substance in the process of expelling an α-particle. On account of the high velocity with which the helium nucleus is shot off, the residue of the atom recoils. **r. radiation.** A radiation produced by bombarding gaseous atoms with alpha-particles, and having its source in the action of the recoil atom. Cf. *Wilson tracks.*

reconstituted milk. Reconstructed milk.

reconstructed milk. A beverage obtained by emulsifying unsalted butter in a solution of skimmed milk powder. Gelatin is sometimes added as a stabilizer.

recovery. The extraction of valuable constituents from a raw material, by-product, or waste-product; as, copper extracted from ores, silver precipitated from photographic wastes.

recrystallization. Repeated crystallizations for the purpose of purification.

recrystallize. To purify a substance by repeated crystallization.

rectification. (1) The redistillation of a liquid for the purpose of purification. (2) The transformation of an alternating- into a direct-current. (3) The evaluation of the length of a curved line.

rectified spirit. Spirits of wine. Redistilled alcohol, which contains 84 % by weight of absolute alcohol, is 50°O.P., and has a specific gravity of 0.8382 at 60°F. Cf. *proof spirit.*

rectifier. An electric valve which converts alternating current to direct current; *e.g.*, aluminum r., quartz r., electron valve or transformer. **Dryr-** An asymmetric conductor consisting of a disc of lead sulfide waxed on one side and making contact on both sides with tin foil. **r. cell.** Photo-electric cell.

rectorite. A white aluminum silicate, similar to kaolinite.

recuperator. Regenerator.

red. The least refracted portion of the visible spectral colors. **r. acid.** *1.5*-Dihydroxy-naphthalene-*3.7*-disulfonic acid. **r. antimony.** Kermesite. **r. arsenic.** Realgar. **r. bark.** Red *cinchona.* **r. bole.** Red ocher. **r. brass.** An alloy of 78–83 % copper, 7–9 % zinc, 6–10 % lead, 4–2 % tin. **r. cedar.** Juniper. **r. chalk.** Red ocher mixed with clay. See *red hematite.* **r. chrome.** Lead chromate. **r. cobalt.** Erythrite. **r. copper ore.** Cuprite. **r. couch grass.** Carex. **r. hematite.** See *hematite.* **r. iron ore.** Hematite. **r. lead.** Lead tetroxide. **r. lead ore.** Crocoisite. **r. liquor.** A solution of aluminum acetate, used in dyeing. **r. manganese.** Rhodonite. Rhodochrosite. **r. mercury iodide.** Mercuric iodide. **r. mercury oxide.** Mercuric oxide. **r. metal.** A copper alloy. **r. mustard.** Sinapis nigra. **r. ocher.** Reddle, red bole. A red, often impure, variety of hematite, used as a pigment. **r. oil.** Commercial oleic acid. **r. orpiment.** Realgar. **r. oxide.** Iron sesquioxide. **r. oxide of zinc.** Zincite. **r. pepper.** Capsicum. **r. phosphorus.** See *phosphorus.* **r. pigments.** See *antimony red, carmine, chrome red, realgar, red ocher, venetian red, and vermilion.* **r. precipitate.** Mercuric oxide. **r. prussiate.** Ferricyanide. *r.p. of potash.* Potassium ferricyanide. *r.p. of soda.* Sodium ferricyanide. **r. root.** Sanguinaria. **r. sensitive plate.** A photographic plate that has been made orthochromatic by the addition of a sensitizer, as neocyanine or kryptocyanine, to the emulsion. **r. silver ore.** Pyrargyrite. Proustite. *dark-* Pyrargyrite. *light-* Proustite. **r. stone.** Ferric oxide. **r. vitriol.** Bieberite. **r. zinc ore.** Zincite.

reddingite. A native iron and manganese phosphate from Redding, California.

reddingtonite. A native chromium sulfate.

reddle. Hematite.

redistillation. Repeated distillation of a liquid.

Redonda phosphate. A rich phosphate ore from the West Indies, 40 % P_2O_5.

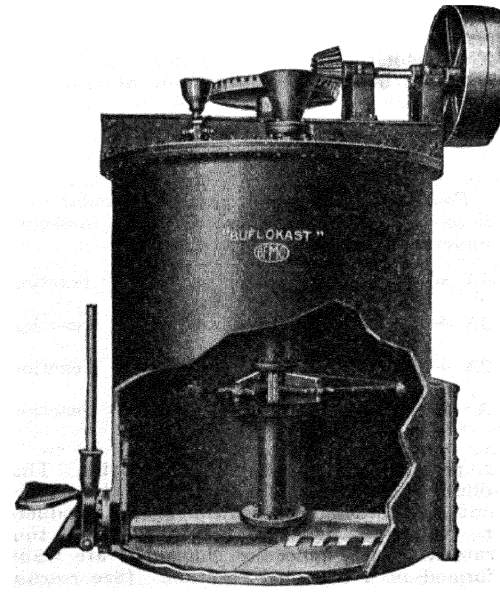
redox. Reduction-oxidation or electronation. **r. equilibrium.** Describing a reaction which is poised at a definite r_H-value. Cf. *poising agent, oxido-reduction potential.* **r. indicator.** See *indicator.* **r. series.** A table of oxidizing and reducing reactions arranged in order of intensity.

redruthite. Cu_2S. A black mineral.

reduce. To add one or more electrons to an atom (electronate). Hence: (a) to decrease the valence number of an atom by means of a corresponding increase in the valence number of another atom (which is oxidized); (b) to deprive of oxygen or to produce the metallic state; (c) to add hydrogen to an element or compound. Antonym: *oxidize.*

reduced. (1) Brought or restored to metallic form. (2) Brought to a lower stage of oxidation, q.v. **r. iron.** Finely-powdered metallic iron obtained by heating ferric oxide in a current of hydrogen. **r. oil.** Crude petroleum from which the hydrocarbons of lower boiling-points have escaped by evaporation, or have been removed by distillation.

reducer. (1) Reducing agent. (2) A solution which decreases the intensity of a photographic



image, as a fresh mixture of equal parts of 10 % sodium thiosulfate and 3 % potassium ferricyanide solutions. (3) A cast iron kettle,

with a power-driven stirring device, used in large scale reductions **Jones-** An apparatus for reducing ferric iron to ferrous iron by passing the solution through granulated zinc Cf *reductor*

reducible Capable of being reduced

reducin $C_{12}H_{24}N_6O_9$ A leukomain derived from urochrome

reducing agent Reducer A substance that is readily oxidized (loses a valence electron) and, thereby, reduces another substance (which gains a valence electron) The common reducing agents are nascent hydrogen, hydrogen sulfide, sodium sulfite, stannous chloride, hydriodic acid, ferrous chloride sodium amalgam sulfur dioxide, formaldehyde and zinc dust Cf *oxidizing agents* **r flame** The luminous portion or inner cone of the blowpipe flame or the bunsen burner in which there is an excess of unburnt carbon or hydrocarbon gas which acts as a reducing agent on the minerals or substances brought into contact with it **r furnace** A shaft furnace in which ores are reduced to metals **r sugar** A mono- or di-saccharide (as, glucose or fructose) that reduces copper or silver salts in alkaline solutions Cf *Fehling's solution*

reductase An enzyme that acts as a reducing agent

reductic acid See *reductones*

reduction (1) Making less or smaller Converting to a fine state Reproducing on a smaller scale (2) Describing a chemical reaction in which one or more valence electrons are added to an atom This process is the exact reverse of oxidation and both occur concurrently Types of reduction are illustrated in the following particular cases (3) In particular (A) The removal of oxygen from a compound as, a change from CuO to Cu (the copper atom gains two electrons), from RCOOH to RCOH, from $MClO_3$ to MClO (B) The addition of hydrogen to an element or compound, as, a change from Mg to MgH_2, from CH CH to CH_3CH_3, from RCHO to RCH_2OH (C) The change from a state of higher valence to one of lower valence as, from the ferric to the ferrous state or to metallic iron, from the cupric to the cuprous state or to metallic copper, from chlorine to a chloride These reactions are written

$$Fe^{+++} + 1(-) = Fe^{++}$$
$$Fe^{++} + 2(-) = Fe$$
$$Cu^{++} + 1(-) = Cu^{+}$$
$$Cu^{+} + 1(-) = Cu$$
$$Cl_2 + 2(-) = 2Cl^{-}$$

In these equations the symbol (−) denotes an electron, or negative charge which will neutralize a positive charge The atom which gains the electron is reduced, while the atom which loses it is oxidized Compare *oxidation electronation, redox* **r intensity** r_H See *oxido-reduction potential* **r oxidation** See *redox* **r potential** The potential obtained when a platinum electrode is immersed in a solution containing an ion that is being reduced

reductones Apparent vitamin C Reductic acid Reducing substances present in dehydrated foods or produced by the action of hot alkali on carbohydrates They react very similarly to ascorbic acid, and therefore interfere with its determination by the titration method

reductor (1) An apparatus used for a reducing reaction, as, **Blair-** or **Jones-** (q v) A glass apparatus for the rapid determination of phosphorus in steel (2) A metal or metal amalgam, which can act as a reducing agent

Redwood number A unit which measures viscosity in terms of rate of flow from a standard Redwood viscometer It is standard in Great Britain for oils

Reech's theorem The ratio of the adiabatic to the isothermal elasticity of a fluid equals the ratio of the specific heats at constant pressure and at constant volume For monatomic gases this ratio is 1 66

refikite $C_{20}H_{16}O_2$ A white soft, native resin, in lignite

refine To free from impurities

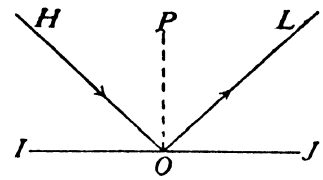
refined Purified or freed from foreign matter

refinery (1) A building or apparatus used for refining purposes (2) A shallow hearth furnace for making wrought iron

refining heat The temperature, 655°C that imparts fineness of grain and toughness to steel

reflected Thrown back

reflection The rebounding of light, heat or sound radiations from a surface in the same



Reflection
I = *reflecting* surface
H = incident ray
L = *reflected* ray
P = perpendicular, or normal
HOP = angle of incidence
POL = angle of *reflection*

form, and unchanged both in quality and quantity

reflector (1) A mirror (2) A device used to cast back light, heat or sound radiations

reflux A backward flow or return of a current **r condenser** A vertical or inclined condenser, from which the condensed liquid flows back into the distilling vessel **r valve** A check valve

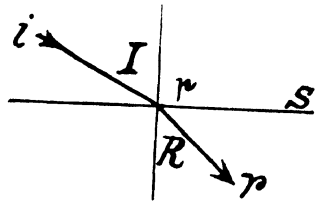
Reformatzky reaction A condensation reaction between ketones and alpha-bromo-aliphatic acids in the presence of zinc or magnesium

$$R_2CO + BrCH_2COOR + Zn \rightarrow$$
$$R_2C(OZnBr)CH_2COOR + H_2O \rightarrow$$
$$(ZnOHBr) + R_2C(OH)CH_2COOR$$

refract To change the direction, deviate or bend

refraction The deflection or change of direction impressed on rays of light obliquely incident on, or passing through a boundary between, two transparent media or traversing a medium of varying density Cf *light, diffraction* **atomic-** See *refractivity* **double-** Birefringence The property of having more than one refractive index, according to the direction of the traversing light It is possessed by all except isometric crystals, by transparent substances which have undergone internal strains (*e g*, glass), and by substances which have different struc-

tures in different directions (*e g*, fibres) **electrical-** See *Kerr effect* **specific-** See *refractivity* **index of-** See *refractive index*



Refraction
i = incident ray
r = *refracted* ray
p = point of incidence
I = angle of incidence
R = *angle of refraction*
s = *refracting surface*

refractive Refringent Pertaining to refraction **r constant** The sum of the refractivities of the pure constituents of a solution each multiplied by the ratio of its mass per unit volume of solution to its own density when pure **r index** (n) The ratio of the velocity of light in a certain medium compared with its velocity in air under the same conditions It is measured by the ratio of the sine of the incident angle to the sine of the angle of refraction, hence, n = sin i/sin r In practice it is estimated by immersion of the crystal in a series of liquids of known n until a liquid is found in which the crystal is invisible Such liquids are

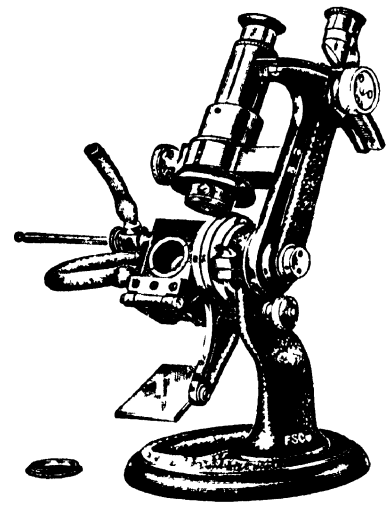
Liquid	n_D at 25°C
methyl alcohol	1 3279
water	1 3328
acetone	1 3598
hexane	1 3750
heptane	1 3868
ethylene chloride	1 4417
chloroform	1 4430
trimethylene chloride	1 4470
cineol	1 4552
glycerol	1 4671
decahydronaphthalene	1 4750
iso-amyl phthalate	1 4870
tetrachloroethane	1 4912
xylene	1 4957
benzene	1 4982
pentachloroethane	1 5006
anisole	1 5150
chlorobenzene	1 5218
trimethylene bromide	1 5220
ethylene bromide	1 5353
o-nitrotoluene	1 5440
nitrobenzene	1 5506
xylidine	1 5550
tri-o-cresyl phosphate	1 5560
bromobenzene	1 5578
o-toluidine	1 5700
aniline	1 5840
bromoform	1 5940
quinaldine	1 6088
iodobenzene	1 6168
cinnamaldehyde	1 6190
quinoline	1 6239
α-chloronaphthalene	1 6318
α-bromonaphthalene	1 6569
methylene iodide	1 7400

Absolute r This refers to a vacuum, and equals n × 1 0029

refractivity The phenomenon of light changing its direction when passing at an angle through media of different densities, it is expressed as (n − 1), where n is the refractive index **atomic-** The refractive power of an atom calculated from the refractivity of its compounds by multiplication of the refractive index by the atomic weight **molecular-** The refractive power of a molecule calculated either by adding the atomic refractivities of its constituents or by dividing the specific refractivity by the molecular weight These are the same where no allowance must be made for unsuspected peculiarities in the molecular structure **specific-** The refractivity of a substance calculated from its refractive index

$$\frac{n-1}{n^2+2}\frac{1}{d}, \quad \text{or} \quad \frac{n^2-1}{n^2+2}v$$

n is the refractive index, d, the density and v, the specific volume ***s r power*** The expression, $\frac{n-1}{d}$, which is almost independent of temperature



Refractometer

refractometer An instrument for determining the refractive index of a substance

refractories The plural of refractory See tables

refractoriness The degree of resistance of a material to softening and melting on the application of heat Usually this is arbitrarily obtained by direct comparison with Seger cones (q v) **r under load** The degree of resistance to deformation shown by a refractory when subjected to stress at a definite temperature or over a range of temperatures

refractory Any material that is slow to melt and resists the action of heat, as, brick, carborundum or other linings for furnaces **r cements** Materials used to hold r bricks together (a) ***straight-*** such as fire clay, silica, sillimanite and magnesite which have high refractoriness (>1650°C) but poor bonding strength (b) ***synthetic-*** (1) Vitrifying at about 9000°C, as portland cement, glass, feldspar fusible clays, which have a very good bonding strength, (2)

REFRACTORIES

Name	Temperature of failure under load in °C	Bulk density	Porosity per cent	Fusing point, °C
alundum, Al_2O_3	1550[c]	2 6		1750–2000
bauxite brick, Al_2O_3 TiO_2	1350[a]	1 6	46–50 %	1750–2000
carborundum SiC	1650[a]	2 0–2 6	17–34 %	2200–2240
chrome brick Cr_2O_3 Al_2O_3 MgO	1450[b]	2 8–3 2		1850–2050
fire clay brick SiO_2 Al_2O_3	1500[a]	1 7–2 1	20–30 %	1500–1750
magnesite brick, MgO	1550[b]	2–2 8	24–40 %	2150–2165
silica brick, SiO_2	1600[b]	2–2 2	18–43 %	1685–1800
zirconia brick, ZrO_2	1510[c]	3 4–4	19 %	2000–2600

[a] The material *softens* under a load of 25 pounds per square inch
[b] The material *shears* under a load of 25 pounds per square inch
[c] The material shows *no failure* under a load of 25 lbs per square inch

	Density	Melting point, °C
aluminum oxide	4 0	2050
chromium oxide	4 0	1990
magnesium oxide	3 2	2800
silicon oxide	2 6	1710
zirconium oxide	5 8	2950

air-setting, mixtures of refractories and fluxes of good bonding strength

refrigerant (1) An agent that causes a sense of cold, used medicinally (2) An agent used to obtain a low temperature, as, a freezing mixture *q v* **mechanical-** A non-corrosive liquid of suitable vapor pressure, used in refrigeration it should be non-toxic and non-inflammable *e g*

	B P , °C	T_c °C	P atm
Hydrogen	−252	−234	20
Air	−181	−140	39
Nitrous oxide	− 89	38 8	77 5
Carbon dioxide	− 78 2	31	73
Hydrogen sulfide	− 60	100	88 7
Ammonia	− 35	130	115
Dichlorodifluoromethane	− 30		
Sulfur dioxide	− 10	155	78 9
Butane	1		
Chloroform	61	260	54 9
Water	100	365	194

refrigeration The production of cold or the lowering of the temperature of a body by conducting away its heat, as in an ice machine or a series of compressors The circuit consists of compressing a gas, cooling it and letting it expand into a low-pressure pipe system where it absorbs the heat and is pumped out and compressed again It is used to liquefy gases solidify liquids crystallize salts from solutions, regulate and control reactions, nitrations oxidations, etc separate impurities from gases preserve foods and in air conditioning (see illustration)

refringent Refractive

refuse Waste, as garbage or sewage

regelation The fusion of ice under pressure, followed by the solidification of ice particles into one solid mass

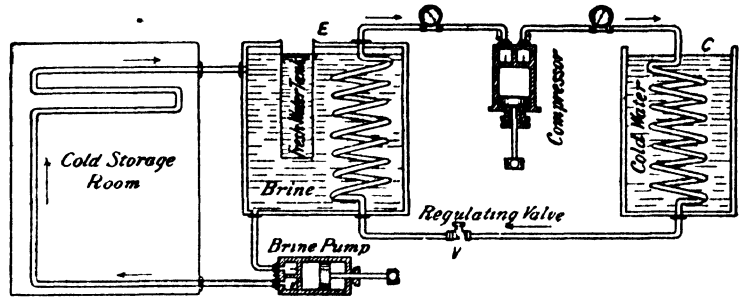
regenerate To renew or produce again Cf *activation, accumulator*

regeneration The repair or renewal to the original state as, of an electric battery, or a catalyst Cf *revivification, permutite, Weldon process*

regenerative Capable of being utilized anew **r furnace** A furnace in which the fuel gases have been preheated by passing through channels heated by the waste gases **r heating** The conservation of heat by utilizing the temperature of waste gases to heat the incoming fuel gases or air

regenerator A series of chambers filled with a checker work of bricks, through which the flue and fuel gases of a furnace are alternately directed

Regnault, Henri Victor 1810–1878 A French chemist, noted for his researches in physical and organic chemistry **R cell** A voltaic cell, which consists of an anode of amalgamated zinc and a cathode of cadmium in a solution of 1 part



Refrigeration
(Tower Smith Turton & Cope, "Physics")

H_2SO_4, 1 part $CaSO_4$ and 12 parts H_2O, and which yields 0.34 volt. **R. value.** The weight of a cubic-meter of hydrogen: 89.87 grams. Cf. *krith.*

Reguir cell. An electric accumulator (1.4 volt), which consists of an anode of copper and a cathode of lead oxide in a solution of $CuSO_4$ and H_2SO_4.

regular system. The cubic system of crystal forms, q.v.

regulator. (1) Buffer solution. (2) A substance used in flotation for pH control; as, soda, lime, sulfuric acid.

regulus. (1) A small compact mass of metal obtained at the bottom of the crucible on reduction of ores. (2) A compound of one or more metals with sulfur. They are usually brittle and crystalline and have a dull greasy luster.

Reich, Ferdinand. 1799–1882. A German mining engineer noted as discoverer of indium (with Richter, 1863).

Reichenbach, Carl Freiherr von. A German chemist and industrialist noted for his theory of od-rays.

Reichert number. The number of cubic centimeters of 0.1 normal alkali required to neutralize the volatile, water-soluble acids liberated on acidification of the soap produced by saponification of ten grams of a fat. **R.-Meissl number, Reichert-Wollny number.** Similar to the R. number, referred to *five* grams fat and determined according to specified procedures. (Cf. *Polenské number.*)

Reid, E. Emmet. 1872– . American chemist noted for organic research.

Reimer's reaction. A reaction of phenols and chloroform in alkaline solutions with the formation of phenol aldehydes.

Reinecke's acid. Tetrathiocyanodiammonochromic acid. $\left[\begin{matrix}(NH_3)_2\\ Cr\\ (SCN)_4\end{matrix}\right]H$; used as a reagent in the isolation of organic bases: (e.g., proline, histidine, choline from proteins). **R. salt.** The ammonium salt, $[(NH_3)_2Cr(SCN)_4]$-NH_4H_2O, used similarly to R's. acid; also as reagent for mercury, with which it gives a red color or precipitate.

reinforced. Made stronger. **r. concrete.** A concrete with a steel foundation and structure used for buildings. **r. wine.** A wine to which alcohol has been added.

reinite. The native iron tungstate, $FeWO_4$.

Reinsch test. The detection of small quantities of arsenic by depositing it from solution as a black stain on metallic copper.

relative. Dependent upon or connected with some other phenomenon. **r. weight.** Atomic weight.

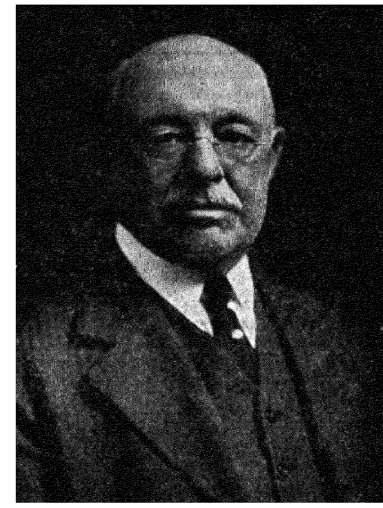
relativity. Einstein's theory. The conception that matter, space and time are relative and not absolute; that all physical phenomena are the result of conditions depending upon their position in or relation to the universe. Hence, to consider any single phenomenon or physical action in terms of its reaction or relation to other phenomena. **general-** Mass exerts an attraction on light; hence: (a) large bodies, as the sun, deflect light waves; and (b) spectral lines coming from atoms on the surface of very massive stars are shifted toward the red. **special-** Energy (E) possesses mass, hence the mass (M) of a body increases slightly when its energy content is increased. $M = E/c^2$, where c is the velocity of light which is an absolute constant of nature. Cf. *mass-energy cycle.*

relay. A sensitive electro-mechanical device which, when operated by a comparatively weak current, as from an photoelectric cell, will cause a corresponding action in a more powerful circuit.

remedy. An agent that cures or prevents disease.

remolinite. Atacamite.

Remsen, Ira. 1846–1927. An American chemist noted as teacher and writer.



Ira Remsen.

renal. Pertaining to the kidneys. **r. test.** A diagnostic test of the functions of the kidneys by administering phenolsulfonephthalein and determining colorimetrically the quantity which appears in the urine.

render. (1) To melt down; to clarify. (2) The removal of fat from animal tissues by heat.

renes. An extract from the kidneys of sheep, pigs, or calves. **r. siccii.** The dried and powdered kidneys of the sheep or pigs; used medicinally.

renin. Hypertensin. A pseudoglobulin present in fresh kidneys after intravenous injection of saline extract; soluble in water, insoluble in alcohol. It maintains a normal blood pressure. **anti-** A substance having the same origin as, but opposite in effect to r. Cf. *rennin.*

rennase. Rennin, prorennin, chymogen, caseinase, lab ferment, chymosin. An enzyme of the gastric juice from the fourth stomach of calves. It hydrolyses caseinogen, and coagulates milk with formation of curd and whey; is used in the manufacture of cheese.

rennet. A preparation of the lining of the stomach of the calf, used as a source of rennase.

rennin. Rennase. Cf. *renin.*

rensselaerite. A variety of talc.

repand. Wrinkled; as a bacterial culture with an uneven or wavy surface.

repercolation. A second or repeated percolation.

replace. To cause the substitution or exchange of an atom or group of atoms by another atom or radical.

replaceable. An atom or group of atoms that can readily be exchanged for another atom or group of atoms.

replacement (1) The substitution of an atom or radical by another atom or radical

$$M + HX = MX + H, \quad \text{or} \quad X + HA = HX + A$$

(2) In mineralogy, the change from one mineral to another by gradual substitution

repulsion The opposite of attraction, or the tendency of two bodies to move away from each other

resacetophenone $C_8H_8O_3$ = 152 06 2 4-dihydroxy acetophenone, $MeCO\,C_6H_3(OH)_2$ White needles, m 147 **methyl-** Peonol

resaldol $C_{16}H_{14}O_5$ = 286 11 Resorcinolbenzoylcarboniacid ethylester 2 4-dioxybenzoyl-o-benzoicacid ethylester, $(OH)_2C_6H_3CO\,C_6H_4\text{-}COOC_2H_5$ A yellow amorphous powder insoluble in water, soluble in alkalis Used medicinally as an intestinal antiseptic

resalgin $C_{19}H_{20}O_3N_4$ = 626 2 Antipyrine resorcylate antipyretic $(C_{11}H_{12}O_4N_2)\,C_6H_6O_4$ A colorless, crystalline powder m 110 soluble in water, alcohol, ether or chloroform, used medicinally as an antiseptic **beta-** Resorcylalgin

research (1) The scientific investigation of a new phenomenon (2) A literary search followed by experimental investigation or verification

CHEMICAL RESEARCH

World activity may be shown by The number of chemical papers published per million inhabitants (A), *the percentage of the total number of published works* (B) *Thus for 1932*

	A Intensity	B Quantity
Germany	125 4	26 9 %
Holland	87 0	2 09 %
Switzerland	75 2	1 06 %
Austria	73 8	1 65 %
Great Britain Canada and Australia	71 3	13 5 %
United States	62 5	25 8 %
France	62 0	12 0 %
Sweden	61 5	1 27 %
Hungary	34 1	9 93 %
Finland	29 8	0 36 %
Denmark	25 1	0 30 %
Czechoslovakia	22 8	1 07 %
Italy	21 0	3 03 %
Japan	17 8	3 71 %
Norway	13 1	0 12 %
Latvia	11 1	0 07 %
Russia	10 4	3 4 %
Belgium	10 1	0 28 %
Poland	6 6	0 68 %
Chile	5 5	0 08 %
Argentine	4 7	0 16 %
Rumania	4 4	0 26 %
Spain	4 0	0 29 %
Brazil	0 6	0 06 %
China	0 13	0 17 %

reseda oil Mignonette oil A fragrant oil used as a flavoring and scent extracted from plants of the Reseda genus such as mignonette

resenes The constituents of resins insoluble in alkalis They contain O, but not as OH, COOH lactone or ester The most valuable varnish resins (as dammar, copal, dragon's blood) are rich in r

reservoir A receptacle for storage purposes

residual That which remains or is left **r affinity** See *affinity* **r gas** The small amount of gas that remains at low pressure in an evacuated apparatus *e g*, a vacuum tube

residue The remainder, those portions that are left *E g*, the ash after an ignition or the insoluble part after filtration **spray-** See *spray*

resilience The property of returning to its former shape after a body has been distorted within its elastic limits It is measured by the work done per unit volume in distorting a body to the elastic limit, or in producing rupture

resilient Elastic or rebounding

resin A class of inflammable, amorphous vegetable products of secretion or disintegration, usually formed in special cavities of plants Generally insoluble in water and soluble in alcohol, fusible and having a conchoidal fracture They are the oxidation or polymerization products of the terpenes, and consist of mixtures of aromatic acids and esters which are insoluble in water, soluble in alcohol ether or essential oils The official (U S P) resins are *benzoin guaiac, mastic* and *resin*, other (non-official) resins are *copal dammar, dragon's blood elaterium lac, sandarac* (Cf *plastics, resin, resinoid, balsam, gum*) **alkyd-** R made from phthalic anhydride and glycerol **artificial-** See *plastics* **gum-** R containing gum capable of softening in water **oil reactive-** A synthetic phenol-formaldehyde product which dissolves in oil, reacts with it and forms a quick hardening varnish **oil soluble-** R not reacting with an oil but soluble in it **oleo-** Balsams A viscous or semi-liquid mixture of r with essential oils **synthetic-** See *plastics resinification* **vinyl-** A synthetic polymerization product of vinyl compounds, Cf *vinylite*

NATURAL RESINS AND BALSAMS

1 true resins

Coniferae	
Abies Picea Pinus, etc species	colophony
Agathis dammara	Manila copal
Agathis australis	kauri
Callitris species	sandarac
Leguminosae	
Hymenaea species	Brazilian copal
Trachylobium species	copal
Burseraceae	
Protium species	dammar
Canarium strictum	black dammar
Canarium commune	Manila elemi
Dipterocarpaceae	
Shorea species	sal dammar
Anacardiaceae	
Pistacia lentiscus	mastic
Rhus vernicifera	Japan lacquer
Liliaceae	
Dracaena draco	dragon's blood
Xanthorrhoea hastilis	black boy
Zygophyllaceae	
Guaiacum officinale	guaiacum
Convulvulaceae	
Exogonium purga	jalap
Moraceae	
Ficus species	shellac

2 gum-resins

Burseraceae	
Boswellia carteri	olibanum
Commiphora myrrha	myrrh
Commiphora mukul	bdellum

Guttiferae	
Caulophyllum tacamahaca	tacamahac
Garcinia hanburii	gamboge
Umbelliferae	
Dorema ammoniacum	ammoniacum
Ferula asafetida	asafoetida
Ferula galbaniflua	galbanum
Convulvulaceae	
Convulvulus scammonia	scammony
Anacardiaceae	
Mangifera indica	mango gum
3 oleo-resins or balsams	
Coniferae	
Abies Pinus etc species	crude turpentine, Canada balsam, pitch, etc
Leguminosae	
Copaiferae species	copaiva balsam
Myroxylon pereira	Peru balsam
Myroxylon toluifera	tolu balsam
Burseraceae	
Commiphora opobalsamum	balm of Gilead
Hamamelidaceae	
Liquidambar orientalis	Levant storax
Liquidambar styraciflua	American storax
Styraceae	
Styrax officinale	storax resin
Styrax benzoin	benzoin
Other families	
Dipterocarpus species	gurjun
Melanorrhoea usitata	theetsee
Opopanax species	opopanax
Populus balsamifera	tacamahac
Vateria indica	white dammar

r acids A group of organic acids derived from resins, as pimaric sapinic, colophonic and sylvic acids **r of copper** An obsolete term for cuprous chloride

resina (1) Latin for resin (2) Rosin

resinamines Insoluble, amorphous solid bases from low-temperature, tar, which have the properties of resins in that they fuse to glassy masses and are deposited from solution as tough films

resinate Any salt of a resin acid mixture

resinene A generic name for neutral resins

resineon An essential oil distilled from black tar oil b 148, used medicinally as an antiseptic

resinification (1) The process of oxidation or polymerization of essential oils by which they become solid and form resins (2) The artificial condensation of phenol with formaldehyde or similar processes, by which resin-like substances are formed Cf *plastics*

resinoic acid The generic name for acidic resins

resinoid A substance that resembles a resin in its physical properties but differs by having a heat-hardening character i e , changing from a soluble and fusible solid to an insoluble and infusible solid on heating Cf *plastics*

resinol (1) In resole (2) The non-crystalline constituents of tar which are soluble in sodium hydroxide solution and can be precipitated from a solution in an organic solvent by addition of light petroleum Cf *resinotannol*

resinotannol A colored alcohol of resin esters which gives the tannin reaction Cf *resinol*

resinous Having resin-like properties

resistance (1) Opposition to force or external conditions (2) The reciprocal of conductance, measured in ohms, the opposition that a conductor offers to the passage of an electric current (see *ohm, mho*) **body**- See *immunity* **external**- The opposition to the passage of an electric current outside the source of current, as in wires, lamps, rheostats, or moving machinery **internal**- Electrical resistance within the generating device **specific**- See *specific resistance*

Approximate electrical resistance of metals, compared with Cu = 1 0

chromel A	47 8
constantan	26 6
German silver	18 0
lead	12 8
tin	8 28
nickel	7 78
iron	5 70
platinum	5 65
zinc	3 62
aluminum	1 61
gold	1 38
copper	1 00
silver	0 92

r box An arrangement of rheostat coils in rows, mounted in a compact container By the insertion of plugs any degrees of resistance may be obtained **r capacity** The cell-constant, K, obtained from the ratio of the measured conductivity of a solution in the cell, K_2, to its known specific conductivity, K_1, hence $K = K_1/K_2$ It is the factor for correcting the observed conductivity for peculiarities in the shape of the cell **r coil** A spool of wire for increasing the r in a circuit **r gage** See *gage* **r to infection** See *immunity* **r wire** A nichrome wire for heating units, or r devices having a definite r

Wire gage	Feet per pound	Ohm per foot
2	5	005
6	12 5	013
8	20	020
11	40	041
14	80	083
18	200	212
22	500	531

r thermometer See *pyrometer*

resistivity The specific resistance $\rho = Ra/l$, where R is the resistance a the cross section and l the length of the material

resistor A metal (as chromium or manganese) which becomes hot on the passage of an electric current used in electrical heating devices or rheostats q v **age**- A substance which when added to rubber inhibits its oxidation *e g* aromatic diamine antioxidants

resocyanin $C_{10}H_8O_3$ = 176 1 4-oxy-β-methylcoumarin, β-methylumbelliferone A colorless crystalline powder, m 185 used in perfumery

resoflavin $C_{14}H_3O_4(OH)_3$ = 286 05 A yellow dye derived from resorcinol

resole A compound formed by the condensation of a phenol with an aldehyde in presence of a catalyst and alkali, they are hardened by heat Cf *bakelite, novolak*

resolution (1) Mesotomy The cleavage or separation of a racemic mixture into its optically-active components Cf *racemization, inversion* (2) The separation of spectral lines into a number of component lines by intense electric or magnetic fields, Cf *Stark effect*

resolving power The power of a lens to produce a detailed and distinct image of an object at certain distances

resonance (1) The vibrations set up by sound or electromagnetic waves in a material which is capable of vibrating with the same or a multiple frequency Cf *luminescence, fluorescence* (2) Describing an atom which emits rays of the same wave length as it has previously absorbed (3) Mesomerism The phenomenon which occurs when an atom takes up a spatial position intermediate between two other theoretically-possible positions

resonant Producing sound

resonator (1) An instrument used to intensify sound waves or electro-magnetic oscillations by resonance in a suitable material (Cf *quartz oscillator*) (2) A chromophoric or fluorophoric constellation (q v) of electrons which absorbs rays of certain wavelengths hence the electronic arrangement of a chromophore or fluorophore

resopal A synthetic resin used for switches and illumination accessories

resopyrine A derivative of resorcinol and antipyrine Minute rhombic crystals, insoluble in water, used medicinally

resorcin Resorcinol **r blue** A microchemical stain

resorcinol $C_6H_6O_2$ = 110 1 Resorcin *1 2*-benzenediol,* metadihydroxybenzene $C_6H_4(OH)_2$ A diatomic phenol, colorless tablets d 1 282 m 116, b 276, very soluble in water, alcohol, or ether Used as a reagent for many organic compounds as a reducing agent in the manufacture of fluorescein, eosin, and many other dyes synthetic drugs, and photographic developers medicinally, as an external dehydrant, antiseptic, antiferment, and bactericide **acetamido-** Dihydroxy-acetanilide **dimethoxy-** $C_6H_4(OMe)_2$ = 138 1 A colorless liquid d 1 080, b 214, slightly soluble in water soluble in alcohol or ether, used in organic synthesis **dimethyl-** Xylorcinol **dithio-** *1 3*-Phenylene mercaptan **hexahydro-** *1 3*-Cyclohexanediol **hexyl-** Hexylresorcinol **methyl-** Orcinol ***p*-nitrobenzeneazo-** $(HO)_2C_6H_3N{:}NC_6H_4NO_2$ A sensitive reagent for Mg 0 1 mg of which in 5 cc gives a blue color **propyl-** Divarinol **trimethyl-** Mesorcinol **trinitro-** Styphnic acid **r carbolate** Phenoresorcin **r monoacetate** Euresol **r phenate** Phenoresorcin **r phthalein** See *fluorescein* **r yellow** Tropeolin

resorcitol *1 3*-Quinitol

resorcyl The monovalent radical of resorcinol —C_6H_4OH (1 3-hydroxybenzene)

resorcylalgin Beta-resalgin, antipyrine resorcylate An isomer of resalgin m 115 soluble in water alcohol or ether

resorcylate A salt of one of the resorcylic acids

resorcylic acid $C_7H_6O_4$ = 154 1 Resorcinol carboxylic acid, dihydroxybenzoic acid, $C_6H_3(OH)_2COOH$ A group of triatomic, monobasic acids in which the two OH groups are in the *meta-* position, thus

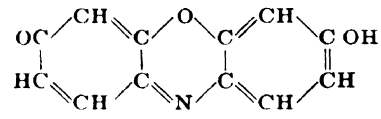
α- or 3 5-dihydroxybenzoic acid, q v
β- or *2* 4-dihydroxybenzoic acid, q v
γ- or 2 6-dihydroxybenzoic acid, q v

propyl- Divaric acid

resorption The absorption of excreted material including the products of inflammation

resorpyrine Resopyrine

resorufin $C_{12}H_7O_3N$ = 213 1 Oxyphenazone, oxyphenoxazone The heterocyclic compound



Used to detect halogens, as its intense fluorescence in alkaline solution is destroyed by Cl or Br

respiration The process of breathing, by which air is inhaled (inspiration) and expelled (expiration) from a living organism In mammals respiration depends on the chemical equilibrium between the hemoglobin (*HG*), oxygen, carbon dioxide, and sodium bicarbonate, as a result of which (1) in the lungs (where an excess of oxygen exists) the hemoglobin is transformed to oxyhemoglobin, and (2) in the tissues (where an excess of carbon dioxide exists) the oxyhemoglobin releases the oxygen and removes the carbon dioxide

$$\begin{array}{ccc} NaHCO_3 + O_2 + & & CO_2 + O_2 + H_2O + \\ & (2) & \\ HG(COOH)_4 & \rightleftharpoons & HG(COONa)_4 \\ & (1) & \\ (2)\ \uparrow\downarrow\ (1) & & (2)\ \downarrow\uparrow\ (1) \\ & (2) & \\ O_2HG(COOH)_4 & \rightleftharpoons & O_2HG(COONa)_4 \\ & (1) & \\ + NaHCO_3 & & + CO_2 + H_2O \end{array}$$

The sodium bicarbonate in blood acts as a buffer

respirator Inspirator inhalor A gas-mask or screen of fine wire or gauze with or without adsorbing or chemical reagents, worn over the mouth or nose to protect the wearer from dust, smoke, poisonous or irritating gases **automatic-** A gas mask

respiratory Pertaining to respiration **r metal** The metals Fe Mn, Cu Zn and Mg which are constituents of chromoproteins See *pigment* **r quotient** The ratio of the volumes of inhaled oxygen to expelled carbon dioxide, $(O_2)/(CO_2)$

restitution The reverse reaction of substitution i e the restoration of the original compounds An element is either oxidized or reduced to the free state in this process (cf *substitution*)

restorative An agent that aids in renewing or promoting a healthy physical condition

resublimed Purified by repeated sublimation

resultants The products of a chemical reaction, reaction-products Cf *reactants*

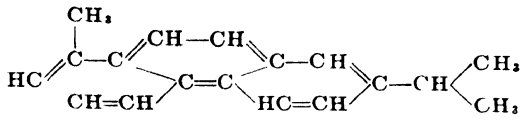
resuscitation The restoration of consciousness or life in one apparently dead from asphyxiation or suffocation **r gas** A mixture of approx 93 % O_2 and 7 % CO_2 used for artificial respiration

retamine $C_{15}H_{26}ON_2$ = 250 2 An alkaloid from the young shoots of *Retama sphaerocarpa*, long needles, m 162, insoluble in water

retardation A slowing-up of a chemical reaction a negative catalysis

retarder A substance added to a reacting mixture to prevent the reaction from becoming too vigorous, as the addition of potassium bromide to photographic developers to prevent over-development Cf *accelerator, promoter, catalytic poison*

retene $C_{18}H_{18}$ = 234 23 Methylisopropyl-phenanthrene A hydrocarbon from pine tar Lustrous leaflets, d 1 13 m 98 b 390 slightly soluble in water soluble in alcohol or ether



retention The holding or retaining of a substance or property

retentivity The holding-back or retardation of a property

Retger's law The physical properties of mixed crystals vary in proportion with their percentage composition

reticulated Retiform Resembling network

reticulin The protein of the fibers of reticular tissue not digested by pepsin or trypsin, it does not yield gelatin on boiling

retiform Reticulated

retina The portion of the eye on which the image is focussed by the lens It consists of a number of bundles of sensitive rods and cones, which carry the sensation to the brain

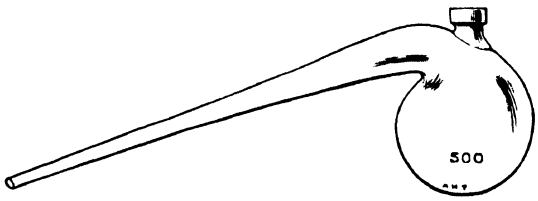
retinene A yellow protein pigment formed in the eye retina by the action of light on rhodopsin (q v) It subsequently forms vitamin A which in turn forms more rhodopsin

retinite The amorphous grey native substance $C_{12}H_{18}O$ **r resins** A group of hard brittle light-brown resins from brown coal They contain no wax (cf *bituminous resins*), and are derived from amber

retinol $C_{32}H_{16} = 400\ 1$ Resinol, codol, resinol A liquid hydrocarbon obtained by distilling pitch or rosin A yellow liquid, b 280 insoluble in water, soluble in alcohol, used medicinally as an antiseptic

retonation A wave propagated backwards through the burned gases from the starting point of an explosion

retort A distilling vessel of glass, iron or other material Originally a flask with a bent neck (alembic)



Retort

retro- A prefix derived from the Latin, indicating *backward*

retrogression A reversal, or the reverse reaction

retronecine $C_8H_{13}NO_2 = 155\ 1$ A basic hydrolysis product of retrorsine

retronecinic acid $C_{10}H_{16}O_6 = 232\ 12$ An acid hydrolysis-product of retrorsine

retrorsine $C_{18}H_{25}NO_6 = 351\ 2$ An alkaloid from *Senecio retrorsus*, a Compositae

retting Loosening the fibre of vegetable materials by the action of moisture and enzymes or bacteria Compare *cow flax*

retzbanyite Native lead bismuth sulfide

reussinite A resin-like, reddish-brown hydrocarbon in certain coal deposits

reverberatory Flickering or blowing downwards **r furnace** An oven in which the flames, but not the fuel come into contact with the material to be heated, by reflection from a sloping roof Cf *furnace*

reversible Pertaining to restoration of the original condition, retracing or reversing **r action** The re-establishment of an original condition **r cell** An accumulator or an electric cell which after discharge of its current, can be restored to an active state by the application of an external current **r colloid** See *colloid* **r electrode** An electrode which owes its potential to ionic changes of a reversible nature (See *electrode*) **r reaction** A reaction that establishes an equilibrium, or which can be made to proceed from right to left or from left to right $A + B \rightleftarrows C + D$

revert To change back, *e g* , from a more soluble to a less soluble form, as the H_3PO_4 of superphosphate

revertose $C_{12}H_{22}O_{11} = 342\ 2$ A disaccharide produced by the action of maltase on glucose solution

revive (1) To restore the original activity, *e g* , of a catalyst (2) To reduce a metallic ore or oxide to the metal

revivification The restoration of the active condition **r of carbon** The reactivation of carbon by (a) burning in the absence of air, (b) washing with acids to remove its ash, (c) washing with an alkaline solution

Rey, Jean 1630 An alchemist who carried out experiments on metallic oxides

Reynold's number An expression of fluid flow in a pipe viz (velocity of flow × diameter of pipe)/coefficient of kinematic viscosity of the liquid

RG acid *1*-Naphthol-*3 6*-disulfonic acid

rH or r_H (1) The symbol for oxido-reduction potential $r_H = \log \frac{1}{p_{H^2}}$, where p_{H^2} is the hydrogen pressure in atmospheres, cf p_H (2) rH factor A factor present in certain human blood erythrocytes which enables them to act as antigens when injected into certain animals and to stimulate the production of immune antibodies in man It is of importance in selecting blood for transfusion

Rh The symbol for rhodium

rhabdophane Phosphocerite The mineral $(Ce, Di\ La)_3(PO_4)_2$

Rhamnaceae Buckthorn family, a group of shrubs or small trees from which the following drugs are derived

Rhamnus cathartica	buckthorn
Rhamnus frangula	frangula
Rhamnus purshiana	cascara sagrada
Ceanothus americanus	New Jersey tea
Gouania domingensis	chewstick

Cf *colletin cathartin*

rhamnase An enzyme from fungi that hydrolyses rhamnose

rhamnegin $C_{12}H_{10}O_5 = 234\ 1$ A glucoside from buckthorn berries

rhamnetin $C_{16}H_{12}O_7 = 316\ 1$ A methyl ester of quercetin and a split-product of xanthorhamnin, used as a yellow coloring material

rhamnicogenol A pentahydroxymethylanthranol occurring as primeveroside in purgative buckthorn and other *Rhamnus* species

rhamnicoside $C_{26}H_{30}O_{15}\ 4H_2O = 652\ 3$ A glucoside from the stem bark of purgative buckthorn *Rhamnus cathartica*, a Rhamnaceae Cf *Chinese green*

rhamnin A fluid extract of *Rhamnus frangula* containing rhamnetin **xantho-** Xanthorhamnin

rhamninose $C_{18}H_{32}O_{14}$ = 470 25 A trisaccharide from Persian berry, *Rhamnus infectoria*, which hydrolyses to two rhamnose and one glucose residue, $[\alpha]_D$ − 41°

rhamnite Rhamnitol

rhamnitol $C_6H_{14}O_5$ = 166 14 A methylpentite, $Me(CHOH)_4—CH_2OH$, obtained by reduction of rhamnose Colorless crystals, m 121, soluble in water or alcohol

rhamnofluorin A constituent of *Rhamnus* species

rhamnogalactoside A series of glucosides that are hydrolysed to rhamnose and galactose, as, robinin and xanthorhamnin

rhamnoglucoside A glucoside that is hydrolysed to rhamnose and glucose as, hesperidin, rutin, and sophorin

rhamnol $C_{20}H_{36}O$ = 292 3 An alcohol, m 132, from cascara sagrada

rhamnomannoside A glucoside that is hydrolysed to rhamnose and mannose, as, baptisin, frangulin, and strophanthin

rhamnose $C_6H_{12}O_5 \cdot H_2O$ = 182 1 A methylpentose from rhamninose and various glucosides $Me(CHOH)_4CHO \cdot H_2O$, isodulcite Colorless crystals, d 1 471, m 92, soluble in water slightly soluble in alcohol or ether It is formed by hydrolysis of glucosides Cf *quinovose*

rhamnoside (1) A glucoside that is hydrolysed to rhamnose (2) $C_{21}H_{20}O_9$ A split-product of the glucoside rhamnoxanthin, which occurs in the rhamnus species

rhamnosterin $C_{18}H_{28}O_2$ = 276 3 A constituent of *Rhamnus* species

rhamnoxanthin A crystallizable glucoside from *Rhamnus frangula*

Rhamnus A genus of trees and shrubs, many have a purgative bark or fruit **R cathartica** Buckthorn berries The dried fruits of *Rhamnus cathartica* **R frangula** See *frangula* **R purshiana** See *Cascara sagrada*

rhatanin $C_{40}H_{43}O_8N$ = 585 4 Angelin, geoffrayin andirin A glucoside of rhatany root and other drugs crystalline needles, m 280

rhatany Krameria

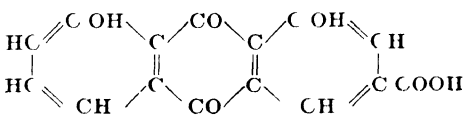
rhe The absolute unit of fluidity It is the reciprocal of the unit of viscosity, or centipoise

rhea fiber Ramie

rheadine $C_{21}H_{19}O_6N$ = 383 18 An alkaloid from opium, small white prisms, m 246

rheic acid $C_{20}H_{16}O_9$ = 400 1 An amorphous red powder Cf *chrysophanic acid*

rhein $C_{15}H_8O_6$ = 284 1 Rheinic acid *1 9*-Dihydroxyanthraquinone-3-carboxylic acid A monobasic diketonic acid obtained from senna leaves rhubarb and lichens golden-yellow prisms m 162



rheinic acid Rhein

rhenate A compound of the type M_2ReO_4 **per-** A compound of the type $MReO_4$ They are all colorless soluble in water (except Ag Tl, K, Rb and Ce)

rhenic acid The dibasic unstable acid H_2ReO_4 which changes to $HReO_4$ **per-** The acid $HReO_4$ formed on dissolving R O_3 in water

rhenium Re = 186 31 Dvi-manganese The element of atomic number 75, a noble metal of the platinum group discovered by Noddack in 1924, by means of its x-ray spectrum, in platinum ores, gadolinite and columbite It is probably identical with uralium Used as a catalyst to dehydrogenate alcohols to aldehydes or ketones at 450–550°C It has two isotopes, mass 185 and 187, and valencies of 7, 6, 4, and 3, d 21 0, m 3440 ± 60°A, soluble in nitric acid, slowly in sulfuric acid, insoluble in HCl and HF **r chloride** (1) $ReCl_7$ = 434 8 R heptachloride Green volatile crystals which are hydrolyzed in water (2) $ReCl_6$ = 399 3 R hexachloride Brown volatile crystals (3) $ReCl_4$ = 328 3 R tetrachloride Brownish-crystals (4) $ReCl_3$ = 292 68 **Hexagonal**, dark red crystals, soluble in water **r fluoride** ReF_6 = 300 31 Pale yellow-green crystals, m 25 6 **r oxides** (1) Re_2O_8 R peroxide A bluish-white solid, soluble in water and acids (2) Re_2O_7 R heptaoxide A yellow solid, m 200, b 450, soluble in water forming perrhenic acid (3) ReO_3 Red solid which changes to Re_2O_7 (4) ReO_2 R dioxide A black powder formed by heating $NaReO_4$ in hydrogen (5) Re_2O_3 A blue solid **r sulfide** $Re_2S_7 \cdot H_2O$ R heptasulfide A black powder, insoluble in acids or alkalis but oxidized by HNO_3

rheochrysin $C_{14}H_{22}O_{10}$ = 446 2 A glucoside from rhubarb Cf *rheopurgin*

rheoid The combined principles from the root of *Rheum officinale*, rhubarb, used medicinally as a tonic and alterative

rheology The science of the deformation and flow of matter *e g* elastic viscous and plastic Cf *softener*

rheometer (1) A galvanometer (2) An instrument for measuring the velocity of the blood current

rheopexy A form of thixotropy (q v), in which solidification occurs as the result of a regular gentle motion instead of vigorous shaking

rheopurgin A constituent of rhubarb which decomposes into 4 glucosides (cf *rheochrysin, rhein*)

rheoscope An instrument for detecting an electric current

rheostan The alloy Cu(52), Zn(18), Ni(25), Fe(5) It is used for rheostats

rheostat An instrument for regulating the resistance of an electric current Cf *resistance box*

rheotannic acid $C_{28}H_{26}O_{14}$ = 562 2 Rhubarb tannin A yellow powder soluble in water

rheotome A current breaker

rheum Rhubarb

rhigolene The first condensation-product of the fractional distillation of petroleum, b 21, which consists largely of butane and pentane Used in atomizers to produce coldness of the skin before surgical operations, also as a solvent

rhinanthin A glucoside obtained from the seeds of *Alectorolophus hirsutus* or *Rhinanthus major*, Scrophulariaceae

rhinemetal An alloy of 97 % tin and 3 % copper, d 7 35, m 300

rhinestone A colorless, highly-refractive glass cut as a brilliant and used as a semi-gem

rhizocholic acid An oxidation-product of cholic acid

rhizoid Describing a bacterial growth of an irregularly-branched or root-like character

rhizome An underground plant stem that partly performs the functions of a root, and is characterized by the presence of leaf bases The following rhizomes are official and used medicinally

Arnica	Hydrastris
Aspidium	Leptandra
Calamus	Menispermum
Caulophyllum	Podophyllum
Cimicifuga	Sanguinaria
Convallaria	Serpentaria
Cypripedium	Spigelia
Geranium	Triticum
Ginger	Valerian
	Veratrum viride

rhizonic acid $C_{10}H_{12}O_4$ = 208 1 *6*-Hydroxy-*4*-methoxy-isoxylic acid White crystals, m 232 **iso-** *4*-Hydroxy-*6*-methoxy-isoxylic acid White crystals, decomp 156, soluble in alcohol or ether, decomp by boiling water

rhizosphere The soil in the immediate neighborhood of a growing root system

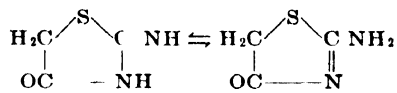
rho The Greek letter, *ρ* or P **r 1** Theelin **r 2** Progesterone

rhodacene $C_{30}H_{20}$ = 380 2 A pyrolytic product from acenaphthene A dark violet crystal mass with greenish metallic luster, m 339, isomeric with chalcacene, into which it changes on strong illumination in dilute solution

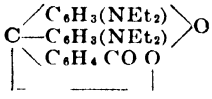
rhodalline Allyl sulfocarbamide

rhodamic acid Rhodanine

rhodamine (1) $C_3H_4ON_2S$ = 116 1 Rhodamic acid, 4-keto-2-thiothiazolidine The heterocyclic compound,



(*2*) A group of red dyes closely allied to the fluoresceins obtained by condensation of phthalic anhydride with *p*-alkylated aminophenols **tetraethyl-** $C_{28}H_{30}N_2O_3$ = 442 2



It is colorless, but its salts are red dyes with an oxonium or quinoid structure

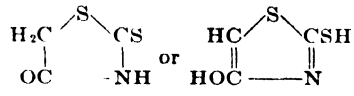
rhodan The monovalent radical —SCN (See *thiocyanate*)

rhodanate Thiocyanate

rhodanic acid (1) Rhodanine (*2*) Thiocyanic acid

rhodanide Thiocyanate

rhodanine $C_3H_3ONS_2$ = 133 1 Rhodanic acid, 4-keto-2-thio-m-thiazolidine



***p*-dimethylaminobenzilidene-** (C_3HNOS) CH - $C_6H_4NMe_2$ A sensitive reagent for silver, with which it gives a flocculent red precipitate

rhodanizing Plating with rhodium (especially on silverware) to prevent tarnishing

rhodanometry (1) The use of free cyanogen to determine the absorption values of oils, the cyanogen behaves analogously to iodine (Cf *iodine number*) (*2*) Thiocyanometry Titration with thiocyanate solutions to determine silver, mercury, etc

Rhode test A color reaction for proteins Concentrated H_2SO_4 and dimethyl aminobenzaldehyde give a purple color

rhodeite Rhodeol

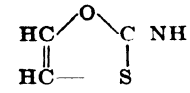
rhodeol $C_6H_{14}O_5$ = 166 1 Rhodeite, rhodeitol A pentatomic alcohol, $CH_2(CHOH)_4CH_2OH$, that is oxidised to rhodeose

rhodeoretin Convolvulin

rhodeose $C_6H_{12}O_5$ = 164 1 A methylpentose glucoside and isomer of fucose in jalap roots

rhodiene $(C_{10}H_{16})_x$ A hydrocarbon from *Rhodium lignum*, rose wood

rhodime C_3H_3ONS = 101 1 2-thiozolimine The heterocyclic compound,



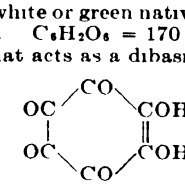
rhodinol $C_{10}H_{19}OH$ = 156 2 2 6-dimethyl-octene-2-ol-8 An unsaturated alcohol Me_2C - CH CH_2 CH_2 CHMe CH_2 CH_2OH, a constituent of citronella and geranium oils, used in artificial or synthetic oil of rose

rhodite Rhodium gold

rhodium Rh = 102 91 A metal of the platinum group atomic number 45 It is a grayish-white ductile metal, d 12 44 m 1920, insoluble in water or acids, it occurs in the platinum ores and gold gravels of South America It was discovered by Wollaston (1804), and its usual valency is three Used for plating it has a permanent brilliant silver-like polish which is superior to chromium-plating Used in alloys in the manufacture of thermo-elements and astronomical measuring instruments, also for plating jewelry and silverware **r black** Finely-divided r metal obtained by precipitation of rhodium salt solutions by formaldehyde, used as a catalyst **r cesium alum** $Rh_2(SO_4)_3$ $Cs_2(SO_4)$,$24H_2O$ = 128 10 Yellow octagonal crystals m 110 and soluble in water **r chloride** $RhCl_3$ $4H_2O$ = 281 34 R sesquichloride A brownish-red, deliquescent powder, decomp 475 slightly soluble in water **r gold** Rhodite A native alloy which contains 57–66 % gold and 34–43 % rhodium **r hydroxide** $Rh(OH)_3$ = 153 92 A black amorphous powder decomp by heat insoluble in water or alcohol, soluble in alkalis **r nitrate** $Rh(NO_3)_3$ $2H_2O$ = 325 0 A red crystalline deliquescent powder soluble in water, insoluble in alcohol **r oxides** (1) RhO = 118 9 R monoxide A gray powder insoluble in water alcohol or ether (2) Rh_2O_3 = 253 8 R sesquioxide A gray amorphous powder obtained by heating r with barium peroxide insoluble in water or alcohol (3) RhO_2 = 134 9 R dioxide A brown powder, insoluble in water or alcohol **r sulfate** $Rh_2(SO_4)_3$ $12H_2O$ = 710 2 A light yellow, crystalline powder, soluble in water **r sulfide** RhS = 135 0 A bluish amorphous powder decomp by heat insoluble in water or alcohol

rhodizite A white or green native calcium borate

rhodizonic acid $C_6H_2O_6$ = 170 1 A dihydroxy-diquinone that acts as a dibasic acid



Its sodium salt is used as spot-test reagent for Ba and Sr (reddish-brown)

rhodochrosite $MnCO_3$ Red manganese A native manganese carbonate

rhododendrin $C_{16}H_{22}O_7$ = 326 2 A constituent of *Rhododendron chrysanthemum* an Ericaceae

Colorless crystals, m.187; soluble in hot water or alcohol.

rhododendrol. $C_{10}H_{12}O_2$ = 164.1. A constituent of *Rhododendron chrysanthemum*. Colorless crystals, m.80.

rhodol. Metol.

rhodolite. A variety of garnet.

rhodonite. $MnSiO_3$. Red manganese, manganese spar. A native manganese silicate.

rhodopterin. A purple oxidation-product of pterin (q.v.).

rhodopsin. The protein pigment of the visual purple (q.v.) in the retina of the eye. Cf. *retinene*.

rhodopurpurin. Rhodovibrene.

rhodotannic acid. $C_{14}H_6O_7$ = 286.1. A tannin derived from the leaves of *Rhododendron ferrugineum*.

rhodovibrene. Rhodopurpurin. A purple carotenoid pigment produced by bacteria.

rhodoviolascene. $C_{42}H_{60}O_2$(?). A carotenoid pigment derived from purple bacteria.

rhodoxanthin. $C_{40}H_{50}O_2$ = 562.35. Thujorhodin. A carotenoid (q.v.) and red isomer of xanthophyll in the red berries of *Taxus baccata* (yew), the leaves of the Russian pond weed, *Potomogeton patans*, and of arbor vitae, *Thuja orientalis*.

rhoduline. A group of aniline dyes of the safranine type; used in textile printing.

Rhoeadales. An order of plants comprising the families: *Papaveraceae, Cruciferae, Resedaceae.*

rhoeadic acid. Papaveric acid.

rhoeadine. $C_{21}H_{21}O_6N$ = 383.2. A crystalline alkaloid obtained from *Papaver rhoeas*, a Papaveraceae.

rhoeagenine. An isomer of rhoeadine.

rhoetzite. Kyanite.

rhomb. Rhombic. **r. spar.** A rhombic form of dolomite.

rhombic. A crystal with three unequal axes all at right angles; as, iodine, sulfur, or copper sulfate. (See *crystal systems.*) **r. dodecahedron.** A crystal of the isometric system which has twelve faces; each face parallel to one axis and having equal intercepts on the other two neighboring faces. **r. mica.** Phlogopite. **r. quartz.** An obsolete term for feldspar. **r. spar.** A form of dolomite. **r. system.** In crystallography, the orthorhombic system.

rhombohedral. A crystal of the trigonal system having a vertical axis of threefold symmetry and three horizontal axes of twofold symmetry. **r. system.** A modified trigonal system of crystals which have three horizontal axes of twofold symmetry in place of the threefold symmetry of the hexagonal system. Cf. *crystal systems.*

rhombohedron. A crystal form bounded by six faces of rhombic outline.

rhotanium. An alloy of palladium and rhodium.

rhubarb. Rheum. The dried rhizomes and roots of *Rheum officinale*, and other Rheum species of the family Polygonaceae. It contains rheopurgin, chrysophanic acid, rhein, tannic acid, and other principles; used medicinally as a laxative and gastric tonic, and as the fluid extract, syrup, tincture, powder, and tablets. Cf. *aporhetin, erythroretin, pheoretin.* **r. tannin.** A rheotannic acid.

Rhus. A genus of trees and shrubs of the Anacardiaceae, cashew family. *R. aromatica.* The bark of a shrub of North America. Used as the fluid extract, as a tonic and stimulant. *R. coriaria.* Sumac. *R. cotinus.* Fustic. *R. diversiloba.* The poison oak of the Pacific Coast. *R. glabra.* Sumac berries. The dried ripe fruit of *R. glabra;* used as the fluid extract, as an astringent. *R. toxicodendron.* The poison oak of the Atlantic States, or poison ivy.

rhusin. Rhusoid. The combined powdered principles from *Rhus glabra*, used medicinally.

rhusoid. Rhusin.

rhythm. Occurrence at regular intervals, as a sound, or wave-motion.

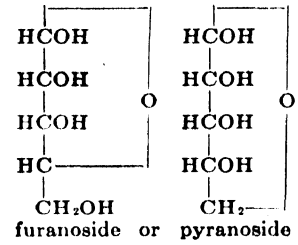
rhythmic. Occurring at regular intervals. **r. deposition.** Precipitation or condensation in gas or vapor mixtures at periodic intervals, such as are produced when two vials of HCl and NH_4OH are placed in a closed bell jar. **r. precipitation.** Periodic precipitation. Precipitation in bands or zones in a colloid, as in Liesegang's rings, q.v.

ribichloric acid. $C_{14}H_8O_8$ = 320.1. An acid constituent from *Galium aparine*, goosegrass, a Rubiaceae.

riboflavin. See *lactoflavin.*

ribonic acid. $C_5H_{10}O_6$ = 166.1. A pentabasic acid, $CH_2OH(CHOH)_3COOH$, derived from ribose.

ribose. $C_5H_{10}O_5$ = 150.1. A pentose sugar constituent of some nucleic acids, $CH_2OH(CHOH)_3CHO$. It may exist as:



furanoside or pyranoside

____ohose- Allulose.

rice. The seeds or grains of *Oryza sativa* which contain mainly starch (rice flour). Used as a food, and finely-powdered as a dusting powder.

Theodore William Richards.

rich. High in content or of great percentage. **r. gas.** The second group of combustible gases obtained by the distillation of coal and coke; as, illuminating gas and coke-oven gas. **r. iron.** Having a high silicon content.

Richards, Theodore William. 1868–1928. An American chemist noted for his atomic weight determinations and experiments in physical chemistry.

richellite. A native iron, calcium phosphate from Richelle, Belgium.

Richter, Jeremias Benjamin. 1762–1807. A German chemist noted for his work on volumetric analysis and on stoichiometrical principles.

Jeremias Benjamin Richter.

R.'s law. Wenzel's law. Each equivalent weight of an acid will completely neutralize an equivalent weight of a base. **R., Victor von** 1842– . A German chemist noted as author of chemical textbooks.

ricin. An albuminous toxin of castor oil beans, the seeds of *Ricinus communis;* it agglutinates red blood corpuscles.

ricinate. Ricinoleate. A salt of ricinoleic acid.

ricinic acid. Ricinoleic acid.

ricinine. $C_{12}H_{12}O_2N_2$ = 216.1. An alkaloid from the leaves and seeds of the castor oil plant, *Ricinus communis.*

ricinoleate. Ricinate. A salt of ricinoleic acid.

ricinoleic acid. $C_{18}H_{34}O_3$ = 298.36. Ricinic acid, *12*-hydroxy-*9*-octadecanoic acid*, *10*-hydroxyoleic acid, elaeodic acid, $Me(CH_2)_5CHOH.CH:CH(CH_2)_7COOH$. A fatty acid from castor oil. A yellow, thick mass, d.0.945, m.17, $b._{15mm}250$, insoluble in water, partly soluble in alcohol or ether. Its alkali salts are very soluble and detoxify antigens.

ricinolein. $C_{57}H_{104}O_9$ = 932.83. Glyceryl ricinoleate, triricinolein. The glycerol ester of ricinoleic acid, a constituent of castor oil (80 %).

Ricinus. The castor oil plant, *R. communis,* an Euphorbiaceae, whose seeds yield castor oil and ricinine.

rickardite. Cu_4Te_3. A copper mineral.

Rideal-Walker test. The determination of the value of an antiseptic from the amount required to prevent the growth of certain organisms (as *B. typhosus*) under standard working conditions. Phenol is taken as the standard of comparison. **R-W. value.** Phenol coefficient. Cf. *germicide.*

riebeckite. An oxide earth which contains Fe, Si, and Na.

riffles. (1) Small waves. (2) A corrugated surface. (3) A sampler, q.v.

rigidity. The state of being inflexible or stiff. **r. modulus.** Modulus of elasticity.

rimnic acid. An acid resin, the chief constituent of rimu resin.

rimose. Describing a bacterial culture which shows fissures and cracks.

rimu resin. A rose-red resin obtained from the rimu or red pine of New Zealand, *Dacrydium cupressinum,* a Coniferae.

ring. (1) A circular structure. (2) A closed chain of atoms. (3) A system of rings; as, the porphin r., cholane r. See also *ring structures.* **bacterial-** A growth of bacteria on the surface of culture media, which adheres to the glass forming a rim. **benzene-** See *benzene ring.* **fused-** Two or more r. having at least two atoms each in common. Cf. *spirane.* **heterocyclic-** A misnomer for heteroatomic r., or a heterocycle. See *ring structures.* **homocyclic-** A misnomer for homoatomic or carboatomic r. or homocycle. See *ring structures.* **Liesegang's-** See *rhythmic precipitation.* **Newton's-** See *Newton.*

r. breakage. The disruption of an atomic ring, or the change from an aromatic to an aliphatic compound. **r. closure.** Ring formation. **r. compound.** A compound in which the atoms of the molecules form a ring or closed chain; as, a cyclic compound. **r. formation.** Exo-condensation. The closing of an atomic chain; the change from an aliphatic to an aromatic compound. **r. reaction.** R. test. A chemical reaction (precipitate or color change) at the boundary between two liquids one of which has been superimposed as a layer on the other. Cf. *horismascope.* **r. structures.** The manifold atomic arrangements in aromatic compounds, the molecules of which may contain one, two, or more rings connected or joined by simple or double bonds or by a single atom (spiro compound). Classification (*Patterson*):

A. The compound consists of a SINGLE RING:
   1. Carbon atoms only . . . . . Carbocyclic
      three atoms—cyclopropane
      four atoms—cyclobutane
      five atoms—cyclopentane
      six atoms—benzene, cyclohexane
   2. Carbon and some other atom(s). Heterocyclic
      The heterocyclic atoms are principally O, S, Se, Te, N, P, As, Sb, Si, Sn, Fe, Hg.

B. The compound consists of TWO or MORE RINGS; each of five or more atoms, but it does not contain an atomic bridge, a crossed valence bridge or a free spiro union.
   1. Carbon atoms only; *e.g.*,
      indene, 6, 5.
      naphthalene, 6, 6.
      fluorene, 6, 6, 5.
      anthracene, 6, 6, 6.
      chrysene, 6, 6, 6, 6.
      dibenzanthracene, 6, 6, 6, 6, 6.

2 Carbon and other atom(s) *e g*, one nitrogen indole 6 5 cinnoline 6, 6

C The compound consists of two rings joined by an ATOMIC BRIDGE or valence bridge, as, terpenes and derivatives

D The compound consists of TWO or MORE ATOMIC BRIDGES, as hexamethylenetetramine

E The compound consists of one or more SPIRO UNIONS

r symbol A graphical representation of an atomic ring, as skeleton symbols or structure symbols **r system** An arbitrary representation on a plane surface of the geometrical arrangement of atoms in the molecule of an aromatic substance **r test** Ring reaction

Ringer, Sidney 1835–1910 An English physiologist noted for his experiments on the physical properties of protoplasm **R fluid, R solution** An isotonic solution of 0 7 % sodium chloride, 0 03 % potassium chloride and 0 025 % calcium chloride in water, used in physiological experiments Cf *saline, salt solution Locke s solution*

rinkite The mineral $3NaF,4CaO\,6(Ti\,Si)O_2\,Ce_2O_3$

Rinmann's green A pale-green mass probably cobalt zincate $CoZnO_2$ obtained by melting zinc compounds with a trace of cobalt salts It is in identification test for zinc compounds in blowpipe analysis

rinneite A Stassfurt salt, $FeCl_2\,3KCl\,NaCl$

rio arrowroot Tapioca

Rio Tinto process The extraction of copper from its ores after oxidation by atmospheric exposure

ripener An agent that is used to ripen fruits which have been shipped unripe for better preservation The fruits, such as dates, persimmons, bananas avocados etc, are placed in a chamber at 65°F and exposed to ethylene gas 1 1000 the gas being renewed each day

ripening (1) The natural process undergone by fruits, which consists of progressive hydrolytic changes by the action of enzymes the fruit becomes sweeter tannins and organic acids disappear, proteins are hydrolyzed, starch changes to sugar and some sugars form esters and the characteristic flavor develops The cell wall undergoes changes, and the color generally deepens (2) The gradual formation of light-sensitive centers in the emulsion of a photographic plate (3) A process of fermentation (as of tobacco) in which organic catalysts may be used to produce maturity (4) A stage in the manufacture of rayon in which the solution attains, naturally or otherwise, the necessary properties for successful spinning **artificial-** Ripener

ripidolite The green or white mineral $(Al,Cr)_2O_3,5(Mg\,Fe)O\,3SiO_2\,4H_2O$

riptography Analysis by a volumetric method in which a solution is titrated with a precipitating agent, and the properties of the clear layer obtained after shaking and allowing to settle, are measured

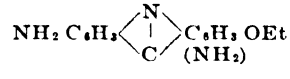
risic acid, rissic acid $C_{11}H_{12}O_7$ = 256 09 *2*-carboxy-*4 5*-dimethoxy-phenoxy acetic acid $C_6H_2(OMe)_2COOH\,OCH_2COOH$ A split-product of rotenone, a lower homolog of derric acid White crystals, m 262

Ritz formula An equation connecting the wave-number, n, of a line in a series of the spectrum with the universal series constant, N

$$n = A - \frac{N}{[m + \mu + (d/m^2)]^2}$$

where m is an integer and A, μ and d are constants

rivanol $C_{15}H_{15}ON_3$ = 253 3 2-ethoxy-6 9-diaminoacridine, ethodin



A yellow crystalline powder, used as a local antiseptic in the treatment of abscesses and wounds It is less toxic and more antiseptic than trypaflavine

rivotite A native basic copper antimony carbonate

Rn The symbol for radon

roan Sheepskin tanned with sumach Cf *skiver*

roast (1) To heat with access of air (2) The product obtained by heating substances, especially ores in air **r gases** The gases formed on roasting ores especially sulfides They consist mainly of sulfur dioxide and arsenious fumes mixed with air and the gases of the fuel used

roaster Roasting furnace

roasting Oxidation of ores in a current of air in a furnace heated by wood coal or oil Roasting removes the sulfur and arsenic, and makes the ores more porous and, therefore, ready for chlorination or hyposulfitization **r furnace** A long firebrick furnace ore is fed into one end and gradually by means of raffles or rakes shuffled toward the firebox, and removed after about three hours of roasting **r temperature** The temperature necessary for roasting depends upon the composition of the ore The following temperatures indicate the reactions taking place

100°C	water boils (removal of moisture)
250°C	Ag_2O decomposes
350°C	Sulfides begin to burn, and $CuSO_4$ is dehydrated
600°C	$FeSO_4$ decomposes to Fe_2O_3
653°C	$CuSO_4$ becomes basic
655°C	Ag_2SO_4 melts
702°C	Basic $CuSO_4$ decomposes to CuO
807°C	Ag_2SO_4 decomposes
1050°C	CuO forms Cu_2O
1100°C	Fe_2O_3 forms Fe_3O_4

robin An albuminous toxin or poisonous nucleoprotein from the bark of the locust tree *Robinia pseudacacia* a Leguminosae of North America, used medicinally as an emetic and purgative

robinin A coloring material extracted from the heartwood of *Robinia pseudacacia*, locust

robinose $C_{18}H_{32}O_{14}$ = 472 2 A trisaccharide occurring with camphor in *Robinia* species, it hydrolyses to two molecules of rhamnose and one of glucose

Robinson, Sir Robert 1886– An English chemist noted for organic research

Robiquet, Henri Edme 1822–1860 A French chemist noted for work on fermentation and photography The son of **R, Pierre Jean** 1780–1840 A French chemist, noted as an analyst of vegetable materials

Robison, Robert. 1884–1941. A British biochemist noted for his work on yeast and fermentation. **R. ester.** Glucose-6-phosphate, produced in the fermentation of sugar by yeast. Cf. *Neuberg ester.*

roburite. An explosive which consists of 87 % ammonium nitrate, 11 % dinitrotoluene, and 2 % chloronaphthalene.

Roccella. A genus of lichens, as *R. tinctoria,* litmus plant.

roccellic acid. $C_{20}H_{20}O_7$ = 372.15. A dibasic acid from *Roccella fuciformis,* a fungus or lichen. Colorless scales, m.178, soluble in hot alcohol, insoluble in water.

roccellin. Orseillin.

rochelle salt. Potassium sodium tartrate.

Rochleder, Friedrich. 1819–1874. An Austrian chemist noted for his work on plant analysis.

rock. Any native aggregation of mineral matter, an essential part of the earth crust. **basic-** See *basic r.* **igneous-** See *igneous.* **primary-** Rock that has not undergone weathering and disintegration. **secondary-** R. that has been altered by disintegration.

r. asphalt. Sandstone or limestone impregnated with asphalt. **r. breaker.** A machine that crushes rock. **r. candy.** Crystallized sucrose. **r. cork.** A variety of asbestos. **r. crystal.** A transparent and colorless variety of quartz. **r. gas.** Natural gas. **r. meal.** Calcium carbonate deposited from water. **r. milk.** A fine quality r. meal. **r. oil.** Petroleum. **r. quartz.** Quartz. **r. ruby.** A red variety of garnet. **r. salt.** Common table salt. Sodium chloride obtained in the solid form by mining; as distinguished from sea salt, which is obtained by evaporation. **r. sand.** The debris of abraded rock. **r. silk.** A variety of fine asbestos. **r. tallow.** Hatchettenine. **r. tar.** A crude petroleum. **r. wool.** A fibrous substance made by blowing a jet of steam against a small stream of molten lime and siliceous rock. Cf. *slag wool.*

rod. (1) Pole, perch. A unit of length in surveying: 1 rod = 25 links = 5½ yards = ¼ chain = 5.02921 meters. (2) A stick-shaped bacillus. **square r.** A unit of area in surveying, (272.25 sq. yards). Cf. *rood.*

rodinal. $NH_2C_6H_4.OH$ = 109.1. p-Aminophenol; used as a photographic developer.

Rœntgen. See *Röntgen.*

Roese-Gottlieb method. A method of determination of fat used in the analysis of milk, dairy products, flour, etc., in which the moist food is shaken with a mixture of ethyl ether and petroleum ether, and the separated ethereal layer evaporated in a weighed vessel.

Roesler's process. A method for separating copper and silver from gold by fusion with sulfur or antimony sulfide to obtain copper and silver sulfides.

Rohrbach's solution. An aqueous solution (d.-3.58) of barium and mercuric chlorides; used for determining the density of minerals by the suspension method.

Röhrig tube. A separating device for fat extraction, consisting of a 87.5-cc. glass tube with delivery tube so placed that the center line coincides with the 23-cc. surface of ether-water layer.

Roman cement. A cement made by heating clay and limestone. **R. ocher.** A native, deep orange variety of ocher. **r. vitriol.** Cupric sulfate.

romanium. An alloy of aluminum with a small percentage of tungsten, copper and nickel.

romeite. $5CaO.3Sb_2O_5$. A native calcium antimoniate.

rongalite. $CH_2O.NaHSO_2.H_2O$. An addition-product of formaldehyde. Used in the textile industry as a substitute for sodium hyposulfite.

Röntgen, Wilhelm Konrad. 1845–1923. A German physicist noted for the discovery and description of x-rays in 1895. **r. rays.** X-rays. **r. ray analysis.** X-ray analysis. **r. tube.** See *x-ray tube.* **r. unit.** The international unit of *x-ray intensity,* q.v.

Wilhelm Konrad Röntgen.

röntgenogram. Radiogram. An x-ray photograph.

röntgenography. Radiography.

röntgenology. A branch of physics that deals with the study of x-rays.

rood. A surface measure, 1 rood = 1210 sq. yards; 40 roods = 1 acre. Cf. *rod.*

root. An underground portion of a plant that absorbs moisture and salts and conducts them to the leaves. It also maintains the plant in position, and may serve as a storage for reserve materials. Cf. *rhizome.* Several roots are used medicinally; official roots (U.S.P.) are:

Althaea	Glycyrrhiza	Rhubarb
Apocynum	Inula	Rumex
Asclepias	Ipecac	Sarsaparilla
Belladonna	Krameria	Senega
Bryony	Lappa	Stillingia
Calumba	Pareira	Sumbul
Gelsemium	Phytolacca	Taraxacum
Gentian	Pyrethrum	

Roozeboom, Hendrick Willem Bakhuis. 1854–1907. A Dutch chemist noted for his practical application of the phase rule.

ropiness. Stickiness or stringiness of an organic liquid (also beer, milk or bread) caused by the action of microorganisms of the B. mesentericus group (e.g., Acetobacter R.).

ropy. Possessing a sticky or stringy consistency.

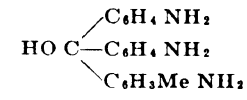
Rorrison's oil thief. A heavy glass tube with a valve, used for taking oil samples.

Rosaceae. Rose family, a group of herbs, shrubs or trees, several of which yield drugs and edible fruits.

Prunus virginiana	wild cherry bark
Prunus domestica	prune
Prunus persica	peach leaves
Pyrus malus	apple tree barl
Pyrus cydonia	quince seeds
Prunus amygdalus amara	bitter almonds
	bitter almond oil
Prunus amygdalus dulcis	sweet almonds
	sweet almond oil
Pyrus (Sorbus) aucuparia	sorbus
Quillaja saponaria	soap bark
Rosa gallica	red rose
Rosa damascaena	attar of rose
Rubus species	blackberry

Rubus idaeus	raspberry
Crataegus oxyacantha	English hawthorn
Prunus laurocerasus	cherry laurel
Fragaria vesca	strawberry
Gillenia stipulacea	American ipecac
Agrimonia eupatoria	agrimony
Brayera anthelmintica	kousso
Potentilla anserina	silverweed
Potentilla canadensis	five-finger grass
Potentilla tormentilla	tormentil

rosaniline $C_{20}H_{21}N_3O$ = 319 3 A triphenyl dye obtained by heating aniline and toluene with nitrobenzene



Red needles, soluble in water or alcohol insoluble in ether Its hydrochloride is fuchsin **r hydrochloride** Fuchsin

rosanilines Fuchsin or magenta dyes The salts and derivatives of rosaniline

Roscoe, Sir Henry Enfield 1833-1915 An English chemist noted for his writings on inorganic and organic chemistry

roscoelite A vanadium-mica ore of California

Rose process The separation of gold from its ores by fusion of the zinc precipitates and aeration to oxidise the baser metals These are removed as a borax-silica flux

Rose, Friedrich 1839- A German chemist noted for work on cobalt ammonia compounds **R, Gustav** 1798-1873 A German chemist noted for his system of crystallography **R, Heinrich** 1795-1864 A German chemist and originator of the use of H_2S in qualitative analysis Both were sons of **R, Valentin (the younger)** 1762-1807 A German chemist, noted for analytical methods (CO_2, As, P etc) and sons of **R, Valentin (the elder)** 1736-1771 A German chemist who first prepared *rose metal*

rose The dried petals of *Rosa gallica*, a Rosaceae Used as the fluid extract as a tonic and in perfumery **cabbage-** The flower petals of *Rosa centifolia* used for rose-water **Christmas-** Black hellebore **corn-** Red *poppy* **dog-** The ripe fruit of *Rosa canina*, used for making pill-masses It contains invert sugar, citric and malic acids **r bengal(e)** Dinodoeosin A red dye, used as adsorption indicator in the titration of chlorides by silver nitrate **r copper** Rosette copper **r metal** Rose's metal An alloy of low melting-point 2 pts bismuth 1 pt tin and 1 pt lead m 94 **r oil** An essential oil obtained by cold extraction of rose petals, used in perfumery **r quartz** A pink variety of quartz, used as a gem **r vitriol** Cobaltous sulfate

rosein Fuchsin

roselite A native hydrated oxide containing Ca, Co, Mg, and As

rosellane Rosite

rosemary Rosmarinus **wild-** Labrador tea **r oil** The volatile oil distilled from the fresh flowering tops of *Rosmarinum officinalis*, a Labiatae

Rosenstein process [Ludwig R 1886- American chemist] A method of making hydrochloric acid from chlorine and water gas $2Cl_2 + 2H_2O + CO \rightarrow CO_2 + 4HCl$

Rosensthiel's green Barium manganate

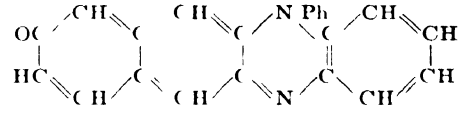
roseo-compound One of the red cobalt ammines of the type, $Co(NH_3)_5X_3\ H_2O$

roseoquinine A red color produced on adding fresh potassium ferricyanide solution to a solution of thalleo-quinine, q v

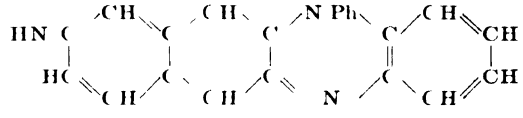
rosette A disk with a centrally-arranged pattern of crystals **r copper** A disk of copper formed on the surface of molten copper by sudden cooling with a spray of water

rosin Colophony The resin remaining after distilling turpentine from the exudation of various species of pine, e g, *Pinus palustris* It contains abietic acid (80-90 %) and its anhydride A yellow, brittle mass, insoluble in water, soluble in alcohol ether, or chloroform It is used as an insulating material for sizing paper and in plasters **r jack** A yellow variety of sphalerite **r oil** A blue fluorescent oil obtained by the destructive distillation of rosin and pitch, used as a lubricant Cf *retinol* **r spirit** A mixture of hydrocarbons obtained in the destructive distillation of rosin **r tin** A reddish variety of cassiterite

rosindone $C_{22}H_{14}N_2O$ = 322 12 Rosindulone An aniline dye, red crystals, m 224, soluble in water



rosinduline $C_{22}H_{15}N_3$ = 321 26 An aniline dye, m 199, soluble in water



r scarlet A red dye used as an oxidation-reduction indicator

rosindulone Rosindone

rosinoil Retinol Cf *rosin* oil

rosinol Retinol

rosinweed The dried root of *Silphium laciniatum* A tonic and expectorant

rosite Decomposed anorthite

rosmarinus The dried leaves and plants of *Rosmarinus officinalis* rosemary a Labiatae Used medicinally as the fluid extract, and as an aromatic in perfumery

rosolic acid $C_{20}H_{16}O_3$ = 304 2 Corallin, trioxytrimethylphenylmethane Red scales with a green metallic luster m 270 (decomp), slightly soluble in water, soluble in hot alcohol or ether, used as an indicator and in the manufacture of aniline dyes Cf *aurin*

rosterite A light red variety of beryl

rosthornite $C_{24}H_{40}O$ = 344 3 A brown resin, d 1 076, found native in Carinthia

rostone A synthetic stone made from finely-ground shale or other alumino-silicate, mixed with slaked lime, moistened with 18-22 % H_2O, and pressed into shape

rot To decay or decompose

rotamerism Geometric *isomerism*

rotameter A non-recording indicator of the rate of flow of a fluid

rotary (1) Rotatory (2) Revolving **r kiln** A long drum, usually inclined which rotates and can be heated **r movement** A circling or twining motion

rotate To turn or twist

rotation The act of turning around an axis, or turning with a circular motion **magnetic-** The optical activity of a liquid placed between magnetic poles **molecular-** The quotient of the molecular weight by the specific rotation of a substance **specific-** The arc through which a substance rotates the plane of polarized light when one gram of it is dissolved in one cc of water and the length of the layer examined is one decimeter It is given by

$$[\alpha]_D^t = \frac{a}{ld},$$

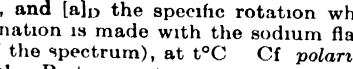
where α is the observed angle of rotation, l, the length of the layer of liquid in decimeters, d, the grams of substance in one cubic centimeter, and $[a]_D$ the specific rotation when the examination is made with the sodium flame (D line of the spectrum), at t°C Cf *polariscope*

rotational Pertaining to rotation

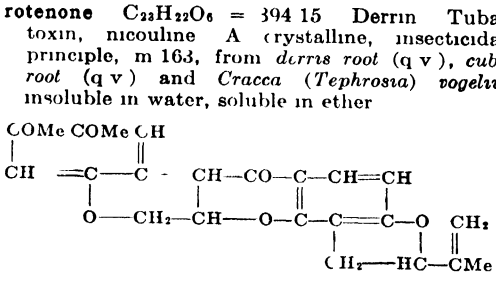
rotatory Optically-active, capable of turning the plane of polarized light **r dispersion** The ratio of the specific rotations of a substance observed with lights of two different wavelengths **r power** Specific rotary power

rotaversion The rearrangement of a cis- to a trans-isomer or vice versa

rotenic acid $C_{12}H_{12}O_4$ = 220 09 Isotubaic acid White crystals m 182, derived from rotenone Cf *tubaic acid*



rotenone $C_{23}H_{22}O_6$ = 394 15 Derrin Tubatoxin, nicouline A crystalline, insecticidal principle, m 163, from *derris root* (q v), *cube root* (q v) and *Cracca* (*Tephrosia*) *vogelii*, insoluble in water, soluble in ether



It is harmless to birds and mammals, but 30 times as toxic as lead arsenate (to silkworms), 25 times as toxic as KCN (to goldfish), and 15 times as toxic as nicotine (to aphids) It crystallizes with many organic solvents, as

rotenone-acetic acid	$2C_{23}H_{22}O_6\ CH_3COOH$
rotenone-benzene	$C_{23}H_{22}O_6\ C_6H_6$
rotenone-carbon tetrachloride	$C_{23}H_{22}O_6\ CCl_4$
rotenone-chloroform	$C_{23}H_{22}O_6\ CHCl_3$

rothic acid $C_{14}H_{12}O_7$ = 292 1 A split-product of nucitannin

rothoffite A native brown garnet, which contains magnesium, iron and calcium

rotor (1) The rotating portion of a piece of machinery, as distinct from the stationary portion (stator) around or inside which it revolves (2) The spinning top of an ultracentrifuge, see *McBain's centrifuge*

rotoscope A stroboscopic instrument for the observation of rapid mechanical motion Cf *chronoteine*

rotten The state resulting from natural decomposition, or rot **r stone** (1) Terra carniosa A light, friable mineral from Derbyshire, England, which consists of fine grains of silica formed from the decomposition of siliceous limestone, used as a polishing material (2) Tripoli

rottisite A native, hydrated nickel silicate

rottlera Kamala

rottlerin $C_{22}H_{20}O_6$ = 380 2 Mallotoxin, kamalin The yellow coloring material of kamala Minute crystalline leaflets of satin-like luster, m 200, soluble in ether or alkalis producing a dark red color

Rouelle, Guillaume François 1703–1770 A French chemist noted for his definitions of acids, bases and salts, and as the first physiological chemist

rouge (1) A dye made from safflower mixed with talc, used as a cosmetic (2) A cosmetic which produces a flush of the skin (3) Colcothar

roughage Fibrous material in food, usually fibrous cellulose, which stimulates the digestive and excretory organs by frictional contact with the alimentary tract

Roussin's salt Dark-colored salts of the type $K[Fe_4(NO)_7S_3]$ formed when nitric oxide is passed through a suspension of precipitated ferrous sulfide in a solution of potassium sulfide

R O V Refined oil of vitriol (95–96 % H_2SO_4)

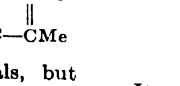
Rowland, Henry Augustus 1848–1901 An American physicist, noted for his electrical and optical researches **R 's value** The wavelength of any Fraunhofer line in the solar spectrum, as determined by Rowland

rowlandite A native silicate of yttrium, which contains cerium, lanthanum and thorium

Royal Society of London A society founded in 1662 for the furthering of natural and physical sciences

Ru Symbol for ruthenium

rubber Caoutchouc, elastica, india rubber An elastic substance obtained from the coagulated milky juice (*latex*) of *Hevea* (Para rubber) and *Ficus* (India rubber) species It contains the hydrocarbon unit



It probably has the formula $(C_5H_8)_8$ = 544 0, d 0 92, but contains varying quantities of oxidation products

	High Grade	Low Grade
Hydrocarbons	90–93 %	25 %
Resins	2–4 %	60 %
Water, impurities, etc	3–8 %	15 %

It is soluble in chloroform, carbon disulfide, ether or benzene On destructive distillation it yields isoprene, dipentene and other hydrocarbons The world output in 1940 was 1,280,000 long tons, coming from British Malaya > Dutch East Indies > Ceylon Cf *elastomer* **guayule r** Guayule **hard r-** Econite, vulcanite **microporous r** Mipor **synthetic r** Elastomer

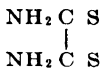
r accelerators See *accelerators* **r goods** Articles prepared by mixing various substances

with r and subjecting to vulcanization, (q v) acceleration (q v) and aging, q v **r sources**

Euphorbiaceae	
Hevea brasiliensis	**Para rubber**
Manihot	Cearea r, q v, Manicoba
Micrandra	Venezuelan r
Sapium	Bolivian r, Columbian r
Moraceae	
Ficus elastica	**India rubber**
Castilloa	Mexican r, West Indian r
Apocynaceae	
Funtumia	African r Ire, silk r
Landolphia	vine r, Madagascar r
Clitandra	Central African r
Willoughbeia	Borneo r, Javar
Hancornia	Mangabeira r
Asclepiadaceae	
Asclepias	milkweed r
Compositae	
Parthenium argentatum	guayule r, q v

rubbone $C_{10}H_{16}O$ (approx) An orange-yellow viscous gum, produced by the atmospheric oxidation of rubber Used in baking varnishes for the lacquer industry to accelerate the oxidation of polymerized linseed oil

rubeane $C_2H_4N_2S_2$ = 120 2 Rubeanhydride, carbon disulfhydrate The diamide of thioxalic acid



obtained by heating hydrogen sulfide and cyanogen Red crystals, soluble in water, alcohol or ether, used as a micro-test for copper Cf *flaveanhydride*

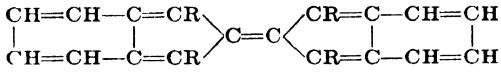
rubeanhydride Rubeane

rubeanic acid Rubeane

rubefacient An agent that produces redness of the skin, due to dilation of the blood vessels, as, turpentine, capsicum or mustard

rubellite Tourmaline

rubene An organic compound which absorbs and regenerates oxygen, it contains the dibenzofulvene group



diphenylditolyl- $C_{44}H_{30}$ = 558 2 White crystals, m 375, having a violet fluorescence **tetraphenyl-** Rubrene

ruberite Cuprite

ruberythric acid Rubianic acid

ruberythrinic acid Rubianic acid

rubia Madder The dried root of dyer's madder, *Rubia tinctorum*, a Rubiaceae

Rubiaceae The madder family, a group of herbs, shrubs or trees that yield important drugs, including quinine and coffee

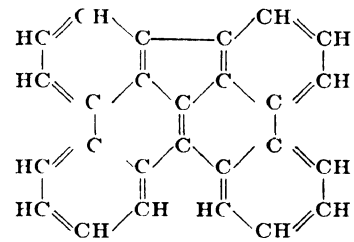
roots	
Cephaelis ipecacuanha	ipecac, emetine
Cephaelis acuminata	Carthagena ipecac, psychotrine
Chrococca racemosa	cahincic acid
Rubia tinctorum	madder, alizarin
bark	
Cinchona species	Peruvian bark quinine alkaloids
Coryanthe yohimbe	yohimbehe
Remijia pedunculata	cuprea bark
Cephalanthus occidentalis	pond dogwood
herbs	
Mitchella repens	squaw vine
Galium aparine	cleavers
seeds	
Coffea arabica	coffee
extract	
Gardenia lucida	kambi
Ourouparia gambir	gambir

Cf the *alkaloids* cheiramidine, cheiramine, nitragynine, nitraversine, palicourine, *glucosides* danain, pinckneyin, and *coloring matter* crocin

rubianic acid $C_{26}H_{28}O_{14}$ = 564 22 Ruberythric or ruberythrinic acid A glucoside from rubia, that hydrolyses to glucose and alizarin Yellow, silky prisms, m 259

rubicelle Spinel

rubicene $C_{26}H_{14}$ = 326 1 The aromatic hydrocarbon



Deep red needles, m 305, insoluble in water

rubidine $C_{11}H_{17}N$ = 163 14 A pyridine base, q v

rubidium Rb = 85 48 An alkali metal and element, atomic number 37, discovered by Bunsen (1861) It occurs as a soft, white metal resembling potassium, d 1 52, m 38, b 696, decomp in water or alcohol, soluble in ether It is found in small quantities in Stassfurt salts, in lepidolite, leucite and mineral waters **r acetate** $RbC_2H_3O_2$ = 144 4 Colorless crystals, soluble in water **r alum** Aluminum rubidium sulfate **r ammonium bromide** $RbBr\,4NH_4Br$ = 545 4 A white or slightly yellowish crystalline powder, soluble in water, used medicinally as a hypnotic **r bichromate** Rubidium dichromate **r bitartrate** $RbHC_4H_4O_6$ = 234 4 Colorless prisms, soluble in water **r bromide** RbBr = 165 4 Regular, colorless crystals, d 3 35, m 683, soluble in water, alcohol, or ether, used medicinally as a nerve sedative **r carbonate** Rb_2CO_3 = 230 90 Colorless deliquescent crystals, m 837, soluble in water, alcohol or ether **r chloride** RbCl = 120 91 A colorless crystalline powder, d 2 20, m 710, soluble in water or alcohol **r chromate** Rb_2CrO_4 = 286 9 Yellow crystals, soluble in water or alcohol **r dichromate** $Rb_2Cr_2O_7$ = 386 9 Orange-red crystals, soluble in water **r fluoride** RbF = 104 4 A white, crystalline powder, soluble in water **r fluosilicate** Rb_2SiF_6 = 312 94 White octahedral crystals, d 3 338, slightly soluble in water **r hydride** RbH = 86 45 Colorless needles, d 2 0, decomp 300 **r hydroxide** RbOH = 102 5

A grayish-white deliquescent powder, d.3.20, soluble in water, alcohol or ether; used in the manufacture of glass and rubidium salts. **r. iodate.** $RbIO_3$ = 260.4. Colorless prisms; soluble in water. **r. iodide.** RbI = 212.4. Colorless cubical crystals, d.3.02, soluble in water; used medicinally as an alterative. **r. ion.** The monovalent cation, Rb^+. **r. nitrate.** $RbNO_3$ = 147.5. Colorless hexagonal crystals, d.3.09; soluble in water or alcohol. **r. oxide.** Rb_2O = 186.9. Colorless octahedral crystals, d.3.72; soluble in water, alcohol or ether. **r. perchlorate.** $RbClO_4$ = 184.91. Colorless crystals. **r. peroxide.** Rb_2O_2 = 202.9. Yellow needles, d.3.65, m.600, decomp. by water. **r. platinichloride.** Rb_2PtCl_6 = 578.9. Yellow crystals, soluble in water, but not in alcohol. **r. sulfate.** Rb_2SO_4 = 266.96. Large, colorless, rhombic crystals, d.3.61, m.1051, soluble in water or alcohol; used medicinally as a cathartic. **r. sulfide.** $Rb_2S.4H_2O$ = 275.0. Colorless crystals; soluble in water or alcohol. **r. sulfite.** Rb_2SO_3 = 250.9. A colorless crystalline powder; soluble in water. **r. tartrate.** $Rb_2C_4H_4O_6$ = 318.8. Colorless crystals; soluble in water. *acid-* $RbHC_4H_4O_6$ = 234.48. White prisms, d.2.282, slightly soluble in water.

rubijervine. $C_{26}H_{43}O_3N$ = 401.34. An alkaloid from *Veratrum album* and *V. viride*, Liliaceae; m.236.

rubine. Fuchsin.

rubitannic acid. $C_{14}H_{22}O_{12}.\frac{1}{2}H_2O$. A tannin from the leaves of *Rubia tinctorium*.

rubixanthin. $C_{40}H_{55}OH$ = 552.4. An orange carotinoid (q.v.) pigment from *Rosa rubiginosa*.

rubrene. $C_{41}H_{26}$ = 518.22. Phenyl ethinyl diphenylmethane, tetraphenyldibenzodifulvene. A red and fluorescent, solid hydrocarbon, m.331. When illuminated in contact with air it forms **oxyrubrene,** $C_{41}H_{26}O_2$, which dissociates when heated, to $C_{41}H_{26}$ and O_2. This reversible oxidation is unique. Cf. *hemoglobin, rubene.* **r. bromide.** A solid having the highest melting point (500°C) of any known organic compound.

rubrocyanine. Ruhrgasol.

rubroglaucine. $C_{16}H_{12}O_5$ = 284.0. A red pigment related to auroglaucine, q.v.

rubrones. A group of substances prepared by bubbling air or oxygen through a solution of rubber in presence of cobalt linoleate as catalyst. Used in paints and varnishes, and for molding purposes.

rubrum scarlatinum. Scarlet R.

Rubus. (1) A genus of shrubs and herbs of the order Rosaceae, (q.v.). (2) Blackberry, cloudberry, dewberry, fingerberry. The dried bark of the rhizomes of Rubus species, which contain tannin; used as an astringent.

Rubus chamaemorus ..... cloudberry
Rubus fructicosus ..... English blackberry
Rubus idaeus ..... raspberry
Rubus villosus ..... American blackberry

ruby. Al_2O_3. A clear, red, transparent corundum; used as a gem. It is similar to sapphire. **artificial-** A red crystalline "gem" made by fusing chromium sesquioxide and powdered alumina at a high temperature.

r. alamandine. Spinel. **r. arsenic.** Realgar. **r. balas.** Spinel. **r. blende.** A red variety of sphalerite. **r. copper.** Cuprite. **r. glass.** A dark red glass, that has been colored by the addition of a small quantity of gold held in colloidal suspension. The ordinary red glass is colored by selenium. **r. mica** Goethite. **r. silver.** Proustite. **r. spinel** Spinel. **r. sulfur.** Realgar.

Rudolfi's equation. The degree of ionization, α related to the dilution, v: $\frac{\alpha^2}{(1-\alpha)\sqrt{v}}$ = constant. (See also *dilution law, Ostwald's law.*)

rue. Ruta. The dried shrubby plant, *Ruta graveolens.* It is used as a condiment and contains rutic and rutinic acid. **r. oil.** Oleum rutae. An essential oil from the leaves of *Ruta graveolens.* A greenish liquid, d.0.837 b.230, insoluble in water, miscible with alcohol It contains methyl-nonylketone and lauric aldehyde.

rufianic acid. Quinizarin sulfonic acid, *1.4*-dioxyanthraquinone-*2*-sulfonic acid. A white crystalline powder, used as reagent for the separation of amino acids.

rufigallic acid. $C_{14}H_8O_8,2H_2O$ = 340.16. *1.2.3.6.7*-Hexahydroxyanthraquinone, $C_{14}H_2O_2.(OH)_6$. Orange-reddish needles; insoluble in water, soluble in alcohol, acids or alkalis Used as dye, and sublimes if heated.

rufigallol. $C_{14}H_8O_8$ = 322.2. *1.2.3.6.7.*9-Hexahydroxyanthraquinone. Red crystals.

rufin. $C_{21}H_{20}O_8$ = 400.2. A resinous mass obtained by heating phlorizin; soluble in alkali (red color).

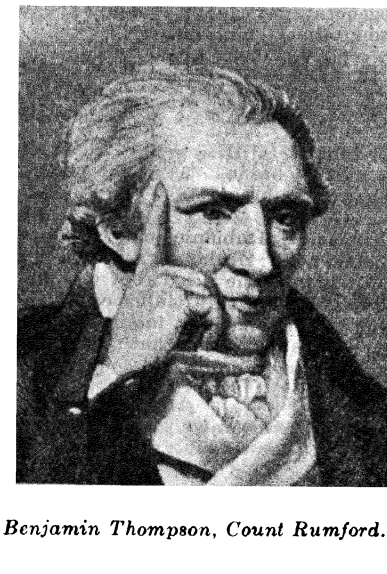
ruflopin. $C_{14}H_8O_6$ = 272.13. Tetrahydroxyanthraquinone. An orange crystalline powder soluble in alcohol.

rufol. $C_{14}H_{10}O_2$ = 210.1. 1.5-Dihydroxy-anthracene, 1.5-anthradiol, 1.5-anthracenediol* Yellow needles; soluble in alcohol (blue fluorescence); decomp. 265.

Ruhmkorff, Heinrich Daniel. 1803–1877. A German electrician, who invented electrical devices **R. coil.** An induction or spark coil.

ruhrgasol. A mixture of CO_2, CO, H_2, N_2 and C_3- and C_4- aliphatic hydrocarbons (35 % by vol. of C_3H_6) recovered from coke-oven gas, and used as an auto-fuel in Germany.

rule. (1) An empirically-found relationship of physical and chemical properties; as, *Crum Brown rule.* Cf. *theory, law hypothesis.* (2) A



Benjamin Thompson, Count Rumford.

ruler. **phase-** See *phase* rule. **slide-** See *slide rule.*

rum. An alcoholic distillation from fermented molasses. **bay-** See *bay-rum.*

rumbatron. A device to produce high-speed electrons for molecular bombardment, q.v. Cf. *cyclotron.*

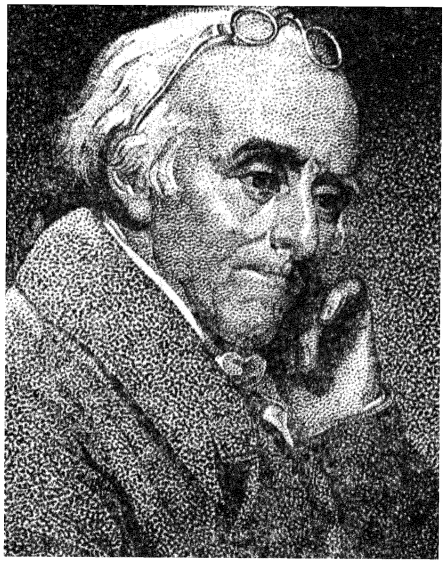
rumex. Yellow dock, yellow jasmine. The dried roots of *Rumex crispus*, a Polygonaceae. Used medicinally as the fluid extract.

Rumford, Count. 1753–1814. Benjamin Thompson, an American scientist noted for his work on the nature of heat, and co-founder of the Royal Institution of London.

rumicin. $C_{15}H_{10}O_4$ = 254.08. Yellow crystals, m.182, from the roots of *Rumex crispus.* It resembles chrysophanic acid.

Runge, Friedlieb Ferdinand. 1795–1867. A German chemist, noted as a writer and discoverer of aniline. Cf. *aniline.*

Rupert's drops. See *Prince Rupert's drops.*



Benjamin Rush.

Rush, Benjamin, 1745–1813. An American physician and pioneer in chemical education, noted as the first American author and professor of chemistry.

Russell-Saunders notation. See *quantum numbers.*

russellite. $Bi_2O_3.WO_3$ = 698.0. A mineral, which occurs sparingly as yellow pellets, in concentrates of tungsten ores in Cornwall, England.

russium. Rs. The undiscovered ekacesium, supposed to be radioactive. (Chem. News, 1927, p. 310.) Cf. *verium.*

rust. (1) An iron oxide mixed with hydroxides and carbonates, that forms on the surface of iron exposed to moisture and air. (2) A red fungus on grain.

rust-proofing. Plating a metal with a less corrodable metal, as tin, cadmium or zinc (see *galvanizing, sherardizing*).

ruta. Rue.

Rutaceae. Rue family. A group of plants that yield acrid resinous principles and essential oils.

root:	
Xanthoxylum senegalense...	artarine
herb:	
Peganum harmala.....	harmel
barks:	
Xanthoxylum americanum..	prickly ash bark
Galipea (Cusparia) officinalis	angostura bark
Ptelea trifoliata.....	wafer ash bark
leaves:	
Barosma betulina.....	buchu
Pilocarpus jaborandi.....	jaborandi
Ruta graveolens.....	rue
fruits:	
Aegle marmelos.....	bael fruit
Xanthoxylum species.....	prickly ash fruit

Cf. *casimirin, carana, curry, skimmianine, xanthopicrin.*

ruthenate. A compound of the type, M_2RuO_4, in which M is a monovalent metal. They are dark-red colored salts, soluble in water, and derived from hexavalent ruthenium. **per-** A compound of the type $MRuO_4$; as, $NaRuO_4$ which forms dark green crystals, soluble in water.

ruthenic. A compound derived from tetravalent ruthenium; as, $RuCl_4$.

ruthenious. Ruthenous. A compound derived from divalent ruthenium: as, **r. chloride.** $(RuCl_2)_x$ = $(172.61)_x$. Ruthenium dichloride. A dark blue solid, insoluble in water.

ruthenium. Ru = 101.7. A rare metallic element of the platinum group, atomic number 44. It occurs as a gray or silver-like, brittle metal, d.12.06, which melts in the electric arc; insoluble in water or acids. It appears to have every positive valency from 1 to 8, and forms coordination compounds and also double salts. **r. bromide.** $RuBr_3$ = 341.7. Dark hygroscopic crystals; soluble in water.

+2; Ru^{++}, ruthenious.....	blue
+3; Ru^{+++}, ruthenic.....	gray
+4; RuO_3^{--}, ruthenite.....	yellow
+6; RuO_4^{--}, ruthenate.....	orange-red
+7; RuO_4^{-}, perruthenate.....	green
+8; RuO_5^{--}.....	red

r. carbonyl. $Ru(CO)_x$. Orange crystals. **r. chloride.** (1) *di-* Ruthenious chloride. (2) *tri-* $RuCl_3$ = 208.1. Ruthenic chloride. Ruthenium sesquichloride, Ru_2Cl_6. Deliquescent, brown crystals, soluble in water, decomp. by alcohol; used medicinally as an antiseptic, and industrially as a catalyst. (3) *tetra-* $RuCl_4$ = 196.70. Orange crystals, soluble in water. **r. fluoride.** RuF_5 = 196.70. Dark green crystals, d.2.963, m.101, b.270, decomp. in water. **r. hydrochloride.** $RuCl_4.2HCl$ = 320.6, or H_2RuCl_6. Chlororuthenic acid. Orange crystals, soluble in water. **r. hydroxide.** (1) $Ru(OH)_3$ = 192.8. A black powder; insoluble in water, slightly soluble in alkalis. (2) $Ru_2O_3.xH_2O$. Ruthenic hydroxide. A yellow powder, slightly soluble in water. (3) $RuO_2.xH_2O$. R. tetrahydroxide. Black powder, insoluble in water. **r. minerals.** R. is found in nature associated with the platinum metals, and occurs as:

native ruthenium.....	Ru
laurite.....	RuS_2

r oxide (1) RuO_2 = 133 8 R dioxide A violet crystalline powder d 7 2, insoluble in water, alcohol or ether It is formed by the action of oxygen upon hot ruthenium (2) Ru_2O_3 = 251 44 R sesquioxide A brown powder, insoluble in water, alcohol or ether (3) RuO_4 = 165 7 R tetroxide A rhombic, yellow crystalline powder, d 3 28, m 25, b 100, insoluble in water, alcohol or ether (4) Ru_2O_5 = 283 40 R pentoxide A black powder (5) Ru_2O_9 = 550 80 R monoxide A black powder, insoluble in water **r oxychloride** $Ru(OH)Cl_2$ = 189 63 Ruthenium red A red powder *ammoniated-* $Ru(OH)Cl_2\ 3NH_3\ H_2O$ = 258 75 A brown-red powder, soluble in water Used as a reagent for pectin, plant mucin, gums, and as a microscope stain **r red** R oxychloride **r sesquichloride** R chloride **r sesquioxide** R oxide (2) **r silicide** RuSi = 129 76 Metallic prisms, d 5 40, insoluble in water **r sulfide** RuS_2 = 165 82 Laurite Gray cubic crystals, d 6 99, insoluble in water **r tetroxide** R oxide (3)

ruthenous Ruthenious

Rutherford, Daniel 1749–1819 A Scotch botanist who discovered nitrogen in 1772 **R, Lord Ernest** 1871–1937 A British physicist, (born in New Zealand) noted for his research on radioactive transformation, disintegration of nitrogen, and the structure of the atom **R atomic theory** An atom consists of a small positive nucleus with A free positive charges in its nucleus (A is the atomic number), surrounded by a system of A electrons in outer levels In addition the nucleus is made up of equal numbers of positive and negative charges, which balance one another The weight of the atom is centered in the nucleus

rutherfordite A mixed native phosphate of cerium, lanthanum and didymium

rutic acid (1) $C_{10}H_{20}O_2$ = 172 15 A monobasic acid from rue (2) Capric acid

rutile TiO_2 A native titanium oxide, in dark tetragonal crystals It is a source of titanium compounds Cf *brookite, sagenite*

rutin (1) $C_{27}H_{32}O_{16}$ = 612 25 A hydroxyflavone gluco-rhamnoside from cowslip, tomato, tobacco, California poppy and herb-of-grace Yellow needles m 190 (2) Barosmin

rutinic acid $C_{25}H_{28}O_{15}$ = 568 3 The coloring material of rue, *Ruta graveolens*

rutonal $C_{11}H_{10}N_2O_3$ = 218 1 Phenyl methyl barbituric acid White crystals, m 227

Rydberg, Johannes Robert 1854–1919 A Swedish physicist, noted for his theories **R's formula** An equation which relates ν, the frequency vibration of the light, to the numbers of the initial and final orbits of electrons

$$\nu = k\left(\frac{1}{n^2} - \frac{1}{n'^2}\right),$$

where n is the number of the inner, and n′ that of the outer orbit in a given jump **R fundamental constant** The value N = 109678 8, in the expression $N = V_0/c$, where c is the velocity of light and V_0 is R frequency constant **R fundamental frequency constant** The value, $V_0 = 3\ 28880 \times 10^{15}\ \text{sec}^{-1}$ in the expression, $V_0 = cN$ Cf *Ritz formula* **R number** Ordinal number **R relation** The atomic number, A, is related to the frequency, ν, of the characteristic radiation by, $\nu = \frac{3}{4}V_0(A - n)^2$, where n is a constant nearly equal to unity

rye The grain of *Secale cereale*, used in making bread **spurred-** Ergot

S

S. The symbol for: (1) Sulfur. (2) Entropy. (3) Black (German: Schwarz) in color names. **S acid.** 1-Amino-8-naphthol-4-sulfonic acid. **2S acid.** 1-Amino-8-naphthol-2.4-disulfonic acid. **S. yellow.** Naphthol yellow.

s. An abbreviation for: (1) symmetrical, (2) secondary, (3) second. (4) Symbol for solubility. **s state.** See *state*.

σ. The Greek letter "sigma." (1) The symbol for $\frac{1}{1000}$ second. (2) A prefix indicating the syn-position. (3) The symbol for stopping power.

Σ. The Greek capital letter "sigma." (1) The symbol for summation. (2) **Σ reaction.** The Wassermann test for syphilis.

∫. The symbol for integration. Cf. *f* = function.

S.A.E. See *S.A.E. classification*.

SDO. Synthetic drying oil, q.v.

S.U.P. *p*-Benzoyl-*p*-aminobenzoyl-*1*-amino-*8*-naphthol-*3.8*-sodium sulfonate, an effective conductor for colloids; a substance which supplies to colloidal particles the electrons necessary to stabilize the system.

S.T. An abbreviation for surface tension. **S.T.-37.** A solution of hexylresorcinol in glycerol and water; it has a surface tension of 37 dynes and is used as a germicide on account of its great ability to penetrate the microscopic crevices of bodies. It is claimed that this solution destroys bacteria in 15 seconds.

S.T.P. An abbreviation for standard temperature and pressure.

Sa. The symbol for samarium (U. S. A.); *Sm* in European practice.

sabadilla. Cevadilla, Indian barley. The dried ripe seeds of *Veratrum sabadilla* or *Schoenocaulon officinale*, a poisonous Liliaceae of Mexico and Central America, used to destroy vermin. It contains veratrine, cevadine and sabadine.

sabadilline. $C_{34}H_{53}O_3N$ = 523.6. Cevadilline. An alkaloid from sabadilla. Cf. *cevilline*.

sabadine. $C_{29}H_{51}O_8N$ = 541.0. An alkaloid obtained from sabadilla and veratrum; short colorless needles, m.238.

sabadinine. $C_{27}H_{45}O_8N$ = 511.5. An alkaloid from sabadilla; colorless needles, m.160, soluble in alcohol.

sabal. Saw palmetto berries. The partly dried, ripe fruit of *Serenoa serrulata* (*Sabal serrulata*), a Palmaceae. Used medicinally as the fluid extract, as a tonic sedative. **s. fiber.** The split leaves from *Sabal palmetto*, thatch palm; used for matting.

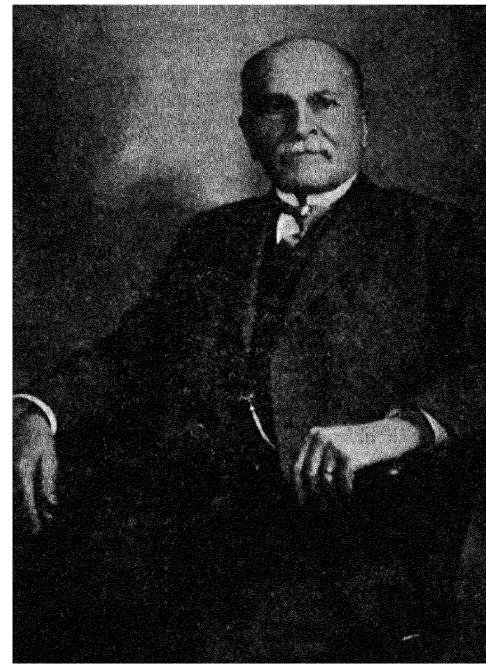
sabalol. The active principle of sabal.

Sabatier, Paul. 1854–1941. A French chemist, noted as pioneer in the hydrogenation of vegetable oils and Nobel Prize winner (1912).

sabatrine. $C_{51}H_{86}O_{17}N$ = 984.9. An alkaloid from sabadilla seeds.

sabbatia. American centaury. The dried herb of *Sabbatia angularis*, a Gentianaceae; used medicinally as a febrifuge. Cf. *erythrocentaurin*.

sabbatin. A glucoside from *Sabbatia elliottii*, quinine flower.

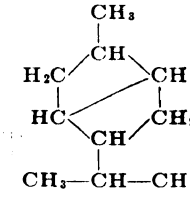


Paul Sabatier.

sabina. Savine.

sabina oil. Savine oil.

sabinane. $C_{10}H_{18}$ = 138.14. The terpene



It gives the radical thujyl. **6-keto-** Thujone.

sabinene. $C_{10}H_{16}$ = 136.2. A hydrocarbon from savine oil. A colorless liquid, d.0.840, b.163, insoluble in water, soluble in alcohol or ether.

sabinic acid. $C_{12}H_{24}O_3$ = 216.3. λ-Hydroxylauric acid, *12*-hydroxydodecanoic acid*, $HO(CH_2)_{11}COOH$, from savine and juniper oils.

sabinol. $C_{10}H_{16}O$ = 152.2. 6-Hydroxysabinene. An alcohol from savine oil.

sabromin. $Ca(C_{22}H_{41}O_2Br_2)_2$ = 1034.41. Calcium dibrombehenate. A white powder, insoluble in water, alcohol or acetone, soluble in ether; used medicinally as a hypnotic.

saccharamide $C_6H_{12}O_6N_2$ = 208 1 The amide of saccharic acid, $(CHOH)_4(CONH_2)_2$

saccharase Invertase

saccharate Sucrate (1) A salt of saccharic acid (2) A compound of a saccharide and a metallic oxide, as, $CaO\ C_{12}H_{22}O_{11}\ H_2O$, monocalcium saccharate

saccharetin $(C_6H_7O_6)_n$ The yellow encrusting matter of sugar cane, it is probably a phlobaphen

saccharic acid $C_6H_{10}O_8$ = 210 11 Tetrahydroxyadipic acid The dibasic acid, $(CHOH)_4(COOH)_2$, obtained on oxidation of dextrose and other hexoses It is very soluble in water, alcohol or ether Cf *saccharinic acid, ascorbic acid, mucic acid*

saccharide (1) A compound of an organic base with sugar, as, casein saccharide (2) See *monosaccharides, disaccharides, polysaccharides, carbohydrates*

saccharification (1) Conversion into sugar (2) Impregnation with sugar solutions, as, occasionally in malting

saccharify To convert starches into sugar

saccharimeter A device for determining the amount of sugar in a solution, as, a polariscope, hydrometer, or fermentation tube Cf *saccharometer*

saccharimetry The determination of the optically-active sugar content of a solution from its optical activity

saccharin, saccharine $C_7H_5O_3NS$ = 183 1 Gluside, sykose, benzosulfimide, benzoylsulfonic imide, saccharinose, sulfobenzoic acid imide, saccharinol, glucid, saccharol, sulfinid, guarantose, saxin, agucarina, 1-benzosulfonazol-2(1)-one The anhydride of o-sulfaminbenzoic acid $C_6H_4\langle{}^{SO_2}_{CO}\rangle NH$ A white crystalline powder, m 220 (decomp), slowly soluble in water, and 400 times sweeter than cane sugar, used as a sugar substitute and sweeting agent **soluble-** The sodium salt of saccharin It is often s mixed with $NaHCO_3$ **s sodium** (1) Soluble s (2) A lactone of a saccharic acid

saccharinic acid $C_6H_{12}O_6$ = 180 09 A group of acids obtained by oxidation of sugars (24 possible isomers) **gluco-** Glucosaccharic acid, 2-methylpentanetetrol carboxylic acid $CH_2OH\ (CHOH)_2\ CHMe\ COOH$, obtained from glucose and fructose (8 isomers) **iso-**

$$CH_2OH\ CHOH\ CH_2\ COH(CH_2OH)\ COOH$$

from milk sugar and cellulose (4 isomers), **meta-** $CH_2OH(CHOH)_2CH_2\ CHOH\ COOH$ (8 isomers) **para-** $CH_2OH\ CH_2\ COH(COOH)\ CHOH\ CH\ OH$ from galactose and milksugar (4 isomers) These all form lactones when their aqueous solutions are evaporated Cf *saccharic, saccharonic,* and *ascorbic acids*

saccharinose A brand of saccharin

saccharobiose Sucrose

saccharol Saccharin

saccharolactic acid Mucic acid

saccharometer A fermentation tube

saccharomyces Yeasts (q v) which ferment sugar **S unit** S U A unit of vitamin H (q v) activity

saccharon $C_6H_8O_6$ = 176 1 The lactone of saccharonic acid

saccharonic acid $C_6H_{10}O_7$ = 194 1 A group of acids, $HOOC\ CMeOH\ (CHOH)_2\ COOH$, obtained by oxidation of sucrose Large colorless crystals, soluble in water

saccharose Sucrose

saccharum officinarum Sugar cane

S A E classification [Soc of Automotive Engineers] The grouping of steel alloys by numbers which indicate their composition The first number shows the alloying metal or the type of steel

1—carbon
2—nickel
3—chromium and nickel (nickel-chrome)
4—molybdenum (moly)
5—chromium (chrome-carbon)
6—chromium and vanadium
7—tungsten
9—silicon and manganese

The second number is the percentage of the principal alloying metal, and the third and fourth numbers, the percentage of carbon Thus the classification "*SAE* 2320" indicates a nickel steel containing 3 % nickel and 20 % carbon A similar classification is in use by the U S War Department, abbreviated W D instead of S A E **S A E number** A measure of the relative viscosity of lubricating oils, related to the Saybolt universal viscosity as follows

S A E number	Saybolt seconds	
	130°F	210°F
10	90–120	
20	120–185	
30	185–255	
40	255–	–75
50		75–105
60		105–125
70		125–150

safety The avoidance of hazards, q v **s lamp** Miner's lamp **s tube** A device used to oppose the effects of sudden pressures or sudden flows of liquids

safflorite $(Fe, Co)As_2$ A native, rhombic iron cobalt arsenide

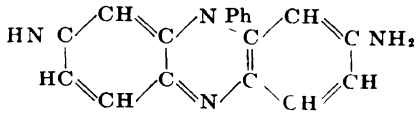
safflower Carthamus

saffron Crocus The dried stigmas of *Crocus sativus*, an Iridaceae, containing the glucoside crocetin Used as a yellow coloring material in foods and confectionary, and as a dye, carminative and emmenagogue **American-, bastard-, false-** Carthamus **Indian-** Turmeric **meadow-** Colchicum **s bronze** Orange *tungsten* **s glucoside** Crocetin **s of mars** Ferric subcarbonate **s substitute** Dinitrocresol

safranal $C_{10}H_{14}O$ = 150 1 An aldehyde occurring in saffron as the glucoside pikrococin

$$CHO\ C\ CMe\ CH\ CH\ CH_2\ CMe_2$$

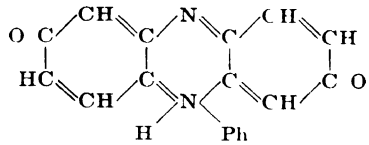
safranine $C_{18}H_{14}N_4$ = 286 1. Phenosafranine A phenazine dye It is used as a stain in microscopy and the textile industry



safranines Derivatives of safranine or its salts as safranine hydrochloride, methylsafranine

safraninol $C_{18}H_{13}ON_3$ = 287 2 A derivative of safranine, in which the NH group is replaced by the keto-oxygen, O

safranol $C_{18}H_{12}O_2N_2$ = 288 2



safrene $C_{10}H_{16}$ = 136 1 A terpene obtained from sassafras oil

safrole $C_{10}H_{10}O_2$ = 162 13 Allylpyrocatecholmethylene ether, shikimol, 1-allyl-3 4-methylenedioxy-benzene, $C_6H_3(OCH_2O)CH_2CH:CH_2$-(3 4 1) A constituent of sassafras oil camphor wood and other plants A clear colorless oil d 1 14 m 10, b 233, insoluble in water and soluble in alcohol, used as an anodyne and in synthetic perfumes **iso-** $C_6H_3(OOCH_2)$-$CH:CH.CH_3$ A liquid, b 251, soluble in ether, insoluble in water

safron Saffron

safrosin $C_{22}H_8O_5Br(NO_2)_2$ A scarlet-red dye, chiefly dinitrodibromofluorescein, used in dyeing silk and wool

sagapenum A gum resin from *Ferula persica*, an umbelliferous plant

sagaresitannol $C_{24}H_{27}O_4$ = 379 3 An acid resin obtained from sagapenum It yields oxypicric acid on oxidation

sage Salvia **s brush** Artemisia **s oil** The essential oil of *Salvia officinalis*, d 0 915–0 925, soluble in alcohol, and containing cineol, thujone and pinene

sagenite Silica containing rutile

sago (1) A starch extracted from the pith of various palms, chiefly the *Metroxylon Rumphii* of India and the East Indian islands, used as a food (2) The pith of several palms and tree ferns, as, Palmaceae, (q v) Cyatheaceae (tree ferns) and Cycadaceae

Sahli's stain A solution of borax and methylene blue in water, used to stain nerve tissues and cell nuclei

sahlite Augite containing iron

Sainte-Claire Deville, Etienne Henri 1818–1881 A French chemist noted for mineralogical and inorganic research (dissociation)

Saint Ignatius bean Ignatia

Saint John's bread Carob beans

saiodine Sajodin

sajodin $Ca(C_{22}H_{42}O_2I)_2$ = 974 1 Calcium monoiodobehenate A light yellow powder, insoluble in water, used medicinally

saké, saki A Japanese beer prepared from rice, water, tané-koji, and saké yeast It is a transparent, yellow, aromatic liquid with pleasant taste, and contains 13–14 % ethyl alcohol and 0 9 % sugar

Sakurai, Joji 1858–1939 A Japanese chemist noted for organic research and teaching **S -Landsberger apparatus** A device for rapidly determining approximate molecular weights by the vapor pressure method

sakuranin $C_{22}H_{24}O_{10}$ = 448 19 A glucoside, m 212, from sakura, the Japanese cherry tree

sal The Latin for salt **s acetosella** Potassium binoxalate **s aeratus** Potassium bicarbonate **s alembroth** Ammoniated mercury **s amarum** Magnesium sulfate **s ammoniac** Ammonium chloride **s carolinum factıcum** An artificial Carlsbad salt **s communis** Sodium chloride **s de duobus** Potassium sulfate **s enixum** Potassium bisulfate **s epsom** Magnesium sulfate **s ethyl** Ethyl salicylate **s fossile** Sodium chloride **s glauberi** Sodium sulfate **s marinum** Sodium chloride **s mirabile** Sodium sulfate **s perlatum** Sodium phosphate **s prunella** A concentrated and refined saltpeter, made by fusing to remove moisture and then molding into a cake, used for meat curing **s rupium** Rock salt **s sapientiae** Mercuric ammonium chloride **s sedatirum** Borax **s soda** Sodium carbonate **s tartari** Potassium carbonate **s volatile** Ammonium carbonate

salacetol $C_{10}H_{10}O_4$ = 194 1 Salantol, salicylacetol, acetosalicylic ester, $C_6H_4(OH)COOCH_2$-COMe Colorless or pink needles m 71, slightly soluble in water or alcohol, used medicinally as a substitute for salol

salamandaridine An alkaloid obtained from the poisonous skin secretion of the salamander species Cf *samandaridine*

salamander A truncated cone of plumbago, by which a crucible can be heated uniformly

salamanderine $C_{34}H_{60}O_5N_2$ = 576 5 A poisonous alkaloid derived from the skin of the salamander species Cf *samandarine*

salamide Salicylamide

salantol Salacetol

salazolon Salipyrine

saldanine An alkaloid from *Datura arborea*, a Mexican shrub It is a local anesthetic

salep The tubers of *Orchis mascula*, *O latifolia* and other Orchidaceae, used as demulcents and as a highly-nutritive food Cf *arrowroot*

saleratus Potassium bicarbonate (sal aeratus)

salethyl Ethylsalicylate

salhypnone $C_{15}H_{12}O_4$ = 256 1 Benzoylmethylsalicylate, $C_6H_4(OCOPh)COOCH_3$ Colorless needles, m 113, insoluble in water, soluble in alcohol or ether, used as a mild antiseptic

salic Containing alumina **s minerals** Those igneous rocks which contain more alumina than iron Cf *alferric*

salicin $C_{13}H_{18}O_7$ = 286 2 Saligenin A glucoside from the bark of *Populus tremula* (American aspen), *Spiraea* species and *Salix* species (willows) Colorless leaflets, d 1 43, m 201 (decomp), soluble in water or alcohol, insoluble in ether or chloroform It hydrolyzes to glucose and salicyl alcohol, the latter is oxidized to salicylic acid

$$(OH)_4C_6H_7OO.C_6H_4CH_2OH = C_6H_4(OH)CH_2OH + C_6H_4(OH)COOH$$

Used as a reagent for nitric acid, and medicinally, as an antipyretic and tonic **benzoyl-**Populin

salicoside Salicin

salicyl The monovalent radical, HO C_6H_4—1 derived from salicylic acid Cf *salicylyl*

salicylacetol Salacetol

salicylal (1) Salicylaldehyde (2) The bivalent radical, $C_6H_4(OH)CH{=}$(1 2-position)

salicylalcohol $C_7H_8O_2$ = 124 1 Saligenin, saligenol, o-hydroxybenzyl alcohol, $C_6H_4(OH)$-CH_2OH A hydrolysis product of salicin Rhombic, colorless needles, d 1 61, m 86, b 100, soluble in water, alcohol or ether, used medicinally as an antipyretic **p-amino-** Edinol

salicylaldehyde $C_7H_6O_2$ = 122 1 Salicylic-aldehyde salicylal o-hydroxybenzaldehyde, $C_6H_4(OH)CHO$ A colorless, aromatic liquid d 1 167, m −7, b 196 5, used in perfumery, slightly soluble in water, soluble in alcohol or ether It is a reagent for acetone **methoxy-** Vanillin **s glucose** Helicin

salicylamide $C_7H_7O_2N$ = 137 1 Salamide, o-hydroxybenzamide $C_6H_4(OH)CONH_2$ Colorless transparent leaflets m 138 b 270, slightly soluble in water, soluble in alcohol or ether, used medicinally as an antipyretic and analgesic **salicylyl-** Disalicylamide

salicylanilide Salifebrin A compound of salicylic acid and acetanilide A colorless powder insoluble in water, soluble in alcohol used medicinally as an antipyretic

salicylase An enzyme that oxidizes salicylaldehyde to salicylic acid

salicylate A salt of salicylic acid $C_6H_4(OH)$-COO M, M is a monovalent metal

salicylic acid $C_7H_6O_3$ = 138 1 o-Hydroxybenzoic acid, $C_6H_4(OH)COOH$ Colorless needles m 158, slightly soluble in water soluble in alcohol or ether Used as a reagent for ferric salts, nitrites, formaldehyde and other organic substances, as a preservative for foods, and as a bactericide antifermentative and antirheumatic agent **acetamidoethyl-** Benzacetin (1) **acetamidomethyl-** Benzacetin (2) **acetyl-** See *acetyl* **o-amino-** $C_7H_7O_3N$ = 153 1 1-Amino-2-hydroxy-3-benzoic acid, $C_6H_3(NH_2)OH$ CO-OH A gray, amorphous, odorless powder insoluble in water, alcohol or ether, used medicinally as an antirheumatic **arsino-** See *arsino* **homo-** Cresotic acid **5-hydroxy-** Gentisic acid **methoxymethyl-** Evernimic acid **methyl-** Cresotic acid **methylcarboxyl-** Spiracin **nitro-** Nitrosalicylic acid **phenyl-** q v **phenylo-** q v **propionyl-** q v **salicylo-** Diplosal **sulfo-** q v

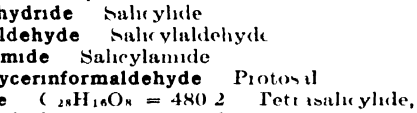
s anhydride Salicylide

salicylic aldehyde Salicylaldehyde

salicylic amide Salicylamide

salicylicglycerinformaldehyde Protosal

salicylide $C_{28}H_{16}O_8$ = 480 2 Tetrasalicylide, an anhydride of salicylic acid



Colorless crystals, m 260

salicylol $C_7H_8O_2$ = 124 06 A colorless fragrant liquid from various plants, used in perfumery

salicylonitrile C_7H_5ON = 119 1 o-Hydroxybenzylnitrile $C_6H_4(OH)CN$ Colorless crystals, m 98, soluble in water

salicylosalicylic acid Diplosal

salicyl-p-phenetidine Saliphen

salicylquinine Saloquinine

salicylresorcinol $C_{13}H_{10}O_4$ = 230 1 The ketone of salicylic acid and resorcinol trihydroxybenzophenone $C_6H_4(OH)CO C_6H_3(OH)_2$ (1 2 4) Colorless leaflets, slightly soluble in water soluble in alcohol or ether, used as an antipyretic and antiseptic

salicylyl The monovalent radical $C_6H_4(OH)$-CO— (1 2 position) Cf *salicyl*

salifebrin Salicylanilide

saliformine $C_{13}H_{18}O_3N_4$ = 278 16 Urotropine-salicylate hexamethylenesalicylate forminesalicylate, $C_6H_{12}N_4 C_6H_4(OH)COOH$ A white crystalline powder, soluble in water or alcohol, used medicinally as an antiseptic and solvent for uric acid

salify To form a salt

saligallol Pyrogallolsalicylate A resinous solid, used externally in a solution in acetone

saligenin (1) Salicyl alcohol (2) Salicin **homo-** Methyl hydroxy benzene

saligenol Salicyl alcohol

salimenthol $C_{17}H_{24}O_3$ = 276 2 Samol, mentholsalicylate, $C_6H_4(OH)COOC_{10}H_{19}$ A colorless liquid insoluble in water soluble in alcohol, used medicinally as a local anodyne and analgesic

salimeter A hydrometer used to determine the density of salt solutions

salinaphthol Betol

saline (1) Salt-like in character (2) A salt-spring or well (3) The taste of common salt (4) Containing sodium chloride **normal-** A sterilised 0 9 % solution of common salt in water **s solution** A 0 6 % solution of sodium chloride used as a physiological salt solution

salines Salt springs or salt lands

salinigrin $C_{13}H_{16}O_7$ = 284 2 A glucoside from the bark of *Salix nigra*, willow, probably identical with piceoside

salinity (1) A comparative indication of the concentration of salts in natural waters as sea water (2) The number of grams of salt in 1 kg seawater when bromides and iodides have been converted to chlorides the carbonates to oxides all organic matter destroyed and the mass heated to 450°C for 72 hours It is related to chlorinity by S = 0 03 + 1 805 Cl

salinimeter An hydrometer for determining the salt content of brine or sea water Cf *salimeter*

salinometer An instrument in which the electrical conductivity of a water is used to control its acidity alkalinity or salt content Cf *salinimeter*

saliphen $C_{17}H_{19}O_4N$ = 257 2 Saliphenin salicyl-p-phenetidine $C_6H_4(OEt)NHC_6H_4(OH)CO$ A colorless crystalline powder m 140 insoluble in water soluble in alcohol acetone or ether used medicinally as an antifebrilic and antipyretic

saliphenin Saliphen

salipyrine $C_{13}H_{13}O_4N$ = 326 2 Antipyrine-salicylate salpyrin pyrosal tyrosal, salazolon $C_{11}H_{12}ON_2 C_6H_4(OH)COOH$ A coarse white crystalline powder or hexagonal crystals, m 91 slightly soluble in cold water soluble in hot water, alcohol or ether, decomp by acids or alkalis, used medicinally as an antipyretic and antiseptic

saliretin $C_{14}H_{14}O_3$ = 230 2 A yellowish resinous substance from salicin

saliseparin Smilacin

salit Borneol salicylate

salitannol $C_{14}H_{10}O_7$ = 290 1 A condensation-product of salicylic acid and gallic acid A white amorphous powder, insoluble in water or ether soluble in alcohol, used medicinally as an antiseptic

saliter, salitre Sodium nitrate

salithymol $C_{17}H_{18}O_3$ = 270 2 Thymolsalicylate $C_6H_4(OH)COOC_{10}H_{13}$ A colorless, crystalline powder, insoluble in water and soluble in alcohol, used medicinally as an antiseptic

saliva The clear, alkaline secretion of the glands in the mouth It contains digestive enzymes such as ptyalin and certain salts (potassium thiocyanate) besides proteins (albumin, globulin) The chemical composition is greatly modified by food and some of the constituents appearing after improper diet, may cause the formation of "tartar" on the teeth Cf *sputum*

salivin Ptyalin

Salix The willows, a genus of trees and shrubs, Salicaceae, whose bark is a source of salicin **S alba** The European or white willow Its bark is used as a tonic **S fragilis** The brittle willow, snap willow Its bark is used as an astringent and febrifuge **S nigra** The pussy willow, American- black-, or swamp willow Its bark is used medicinally as a tonic, antipyretic and sedative

Salkowski's solution A solution of phosphotungstic acid, used to test for albumose in urine

Salle index See *germicide*

salmak Ammonium chloride

salmiac Ammonium chloride

salmine $C_{30}H_{51}O_6N_{14}$ = 709 9 A protamine derived from the spermatozoa of the salmon

salochinine Saloquinine

salocoll $C_{15}H_{11}O_3N$ = 331 2 Phenocollsalicylate $C_6H_4(OC_2H_5)NHCOCH_2CH_2C_7H_6O_3$ Colorless small needles soluble in hot water, used medicinally as an antirheumatic

salol Phenylsalicylate **acetamido-** Salophen **acetyl-** Spiroform **acetylamino-** q v **chloro-** q v **nitro-** q v **tribrom-** Cordol

salolphosphinic acid Salvosal

salophen $C_{15}H_{13}O_4N$ = 271 1 Acetyl-p-amidosalol acetamidosalol acetyl-p-aminophenyl salicylate phenetsal, $C_6H_4(OH)COOC_6H_4NH(COCH_3)$ Small, white scales, m 188 soluble in hot water alcohol or ether, used medicinally as an intestinal antiseptic and antipyretic

saloquinine $C_{27}H_{28}O_4N_2$ = 444 24 Salicylquinine, salochinine, quinine salicylate, $C_6H_4(OH)COOC_{20}H_{23}ON_2$ A colorless crystalline powder, m 130 soluble in alcohol or ether, almost insoluble in water, used medicinally

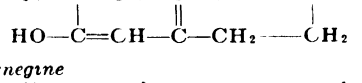
salosalicylide Disalicylide

salpyrine Salipyrine

salseparin Smilacin

salseparisin Parillin

salsoline $C_{11}H_{15}NO_2$ = 193 12 An alkaloid from *Salsola Richteri*, a Cactaceae



Cf *carnegine*

salt (1) For general meaning, see *salts* (2) Common salt, halite or sodium chloride **bakers'-** Ammonium carbonate **bay-** Sodium chloride from sea water **bitter-** Magnesium sulfate **Carlsbad-** A mixture of sodium and potassium sulfate, sodium bicarbonate and sodium chloride **common-** Sodium chloride **diuretic-** Potassium acetate **Epsom-** Magnesium sulfate **Everitt's-** Potassium ferricyanide **Glauber's-** Sodium sulfate **Homberg's-** Boric acid **iodized-** Sodium chloride, with a trace of iodide for table purposes **microcosmic-** Sodium ammonium acid phosphate, $NaNH_4HPO_4 5H_2O$ **Mohr's-** Ferrous ammonium sulfate **Monsel's-** Ferric subsulfate **peptic-** A mixture of sodium chloride and pepsin **phosphor-** Microcosmic s **Plimmer's-** Sodium antimony tartrate **Preston's-** An aromatized ammonium carbonate used as smelling s **Rochelle-** Potassium sodium tartrate **rock-** Sodium chloride **Schlippe's-** Sodium thioantimonate **sea-** Sodium chloride from sea water **Seignette's-** Potassium sodium tartrate **Sorrel-** Potassium bioxalate **spirits of-** Commercial hydrochloric acid **Stassfurt-** See *Stassfurt s* **sweet-** Sodium chlorite **table-** Sodium chloride

s cake Impure sodium sulfate a by-product of the Leblanc soda process **s deposits** Saline residues The accumulation of salts resulting from the evaporation of natural waters such as occurs at Stassfurt (q v) and in the desert They consist chiefly of the carbonates, chlorides, sulfates, and borates of sodium, potassium calcium and magnesium **s glaze** See *glaze* **s hydrates** The solid phases which consist of salt and water, hence any crystal with one or more molecules of water of crystallization **s ice** Frozen brine, m −6°F or −21°C A 2 5 lb eutectic mixture has the same refrigerating effect as 1 lb solid carbon dioxide (dry ice) **s of amber** Succinic acid **s of lemon** Potassium binoxalate **s of phosphorus** Sodium ammonium acid phosphate **s of sorrel** Potassium bioxalate **s of tartar** Acid potassium tartrate **s of tin** Stannous chloride **s of wormwood** Potassium carbonate **s of vitriol** Zinc sulfate **s peter** Potassium nitrate **s solution** Saline solution

salting Treating with salt, usually NaCl **s in** The mutual increase in the solubilities of an electrolyte and an organic compound when added to the same solvent hence more of each substance dissolves when both are present The reverse is, **s out** (1) The precipitation of proteins by the addition of salts (2) In general, the separation of a substance from its solution by adding soluble salts

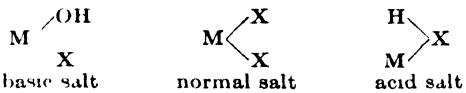
saltpeter, saltpetre Potassium nitrate **Chile-** Sodium nitrate **German-** Ammonium nitrate **Norge-** or **Norway-** Calcium nitrate

salts A group of substances that result from the reaction between acids and bases, a compound of a metal or positive radical and a non-metal or negative radical

$$\underset{\text{base}}{MOH} + \underset{\text{acid}}{HX} = \underset{\text{salt}}{MX} + \underset{\text{water}}{H_2O}$$

acid- A compound of a base and acid radical that contains unreplaced hydrogen atoms from the acid, as, $NaHSO_4$, or NaH_2PO_4 **acidulous-** A salt that has an acid reaction to litmus or similar indicators **alkaline-** A salt that has a basic reaction to litmus or similar indicators **amphoteric-** A salt that has both acid and basic reactions **basic-** A compound of a base and acid radical that contains unreplaced hydroxyl radicals of the base, as $Bi(OH)Cl_2$ **binary-** A compound of two bases and one acid radical, as, $NaKSO_4$ **complex-** Salts which are made up of more than one simple acid or metallic radical, but which ionize in solution into only two types of ions Thus potassium ferrocyanide $K_4Fe(CN)_6 \rightleftharpoons 4K^+ + Fe(CN)_6^{----}$ Cf *Werner's theory* **double-** A molecular

combination of two salts, as, in alums, $M_2SO_4 \cdot M_2(SO_4)_3\ 24H_2O$ They crystallize together from solution, but when dissolved they decompose into their constituent salts, (cf *complex salts*) **ethereal-** An ester, q v **mixed-** Salts of two or more metals, as, $NaKSO_4$ **neutral-** A salt whose solution has a neutral reaction, as potassium chloride **normal-** A compound of a base and acid that have completely neutralized each other



basic salt normal salt acid salt

The reaction in water may be neutral, alkaline acid, or amphoteric **oxy-** A compound of a base with an oxy-acid radical **triple-** A salt containing three metals, as triple chloride

salubrol $C_{23}H_{24}O_2N_4Br_4$ = 708 1 Methylene-diantipyrine tetrabromide, tetrabrommethylene-diantipyrine An orange-yellow powder, m 155 insoluble in water, soluble in alcohol Used medicinally as a harmless dusting powder

salufer Sodium silicofluoride

salumin Aluminum salicylate

salvarsan A German brand of *arsphenamine*

salve See *ointment*

salvia Sage, sawe The dried leaves of *Salvia officinalis* a Labiatae It contains an essential oil, resin, tannin and bitter principles, used as a spice, and medicinally as the fluid extract Cf *sclareol* **s oil** Sage oil

salvianin Monardein The coloring matter from *Salvia coccinea*

salviol $C_{10}H_{16}O$ = 152 1 Thujone An eleoptene from the essential oil of *Salvia* species A colorless liquid b 201, insoluble in water, soluble in alcohol

salvosal lithia Lithium salol-o-phosphite **s potash** Potassium salol-o-phosphite

sama condition Sama-zustand A temperature-difference in complete equilibrium, that is no thermal flow, as, gases at low pressures in a gravitational field Stellar nebulosities with a temperature gradient of 13×10^{-6} degree/cm at a pressure of 10^{-4} mm are in equilibrium

samaderin $C_{29}H_{34}O_{11}$ = 558 2 A bitter principle from the bark and fruit of *Samadera indica*

samandaridine $C_{20}H_{31}ON$ = 301 3 An alkaloid from *Salamandra maculosa* a salamander Cf *salamandaridine*

samandarine $C_{52}H_{80}O\ N_4$ = 792 8 An alkaloid from the skin secretion of *Salamandra* species (salamanders) Cf *salamandrine*

samandatrine $C_{31}H_{47}O_3N$ = 365 4 An alkaloid from the secretions of *Salamandra atra* an Alpine salamander

samaric Pertaining to trivalent samarium **s bromide** $SmBr_3\ 6H_2O$ = 498 27 Green crystals d 2 971, soluble in water **s chloride** (*anhydrous*) $SmCl_3$ = 256 80 Greenish-yellow crystals, d 4 46 m 686, soluble in water or alcohol (*hydrate*) $SmCl_3\ 6H_2O$ = 364 89 Green, trigonal crystals d 2 383 soluble in water **s hydroxide** $Sm(OH)_3$ = 201 45 A colorless powder insoluble in water **s nitrate** $Sm(NO_3)_3\ 6H_2O$ = 444 55 Pale yellow, triclinic prisms, d 2 375, soluble in water **s oxalate** $Sm_2(C_2O_4)_3\ 10H_2O$ = 745 02 Colorless crystals, insoluble in water **s sulfate** $Sm_2(SO_4)_3\ 8H_2O$ = 733 18 Yellow, monoclinic crystals, d 2 93, slightly soluble in water **s sulfide** Sm_2S_3 = 396 8 A yellowish powder d 5 729, m 1900

samarium Sm (Sa) = 150 43 A rare earth metal and element, atomic number 62, discovered by Boisbaudran (1879) A grayish white metal, d 7 7, m 1350 soluble in acid Samarium has a valency of two or three, and forms green and pink colored salts Cf *samaric samarous* **s oxide** Sm_2O_3 = 348 8 A white powder, insoluble in water, soluble in acids

samarous Bivalent samarium **s chloride** $SmCl_2$ = 221 33 Red-brown needles, m 740 soluble in water with the formation of hydrogen **s sulfate** $SmSO_4$ = 246 4 An orange-colored powder, insoluble in water

samarskite A lustrous, velvet-black, native columbate and tantalate of uranium, cerium and yttrium metals, which includes samarium

sama-zustand Sama condition

sambucus Elder flowers The dried flowers of *Sambucus* species, elder family, used medicinally as the fluid extract **s juice** Elderberry juice An extract from the fruit of *Sambucus* species used medicinally as a diuretic and alterant

sambunigrin $C_{14}H_{17}NO_6$ = 295 14 A glucoside in 152 from the leaves of the elder *Sambucus nigra* which hydrolyses to glucose and *l*-mandelonitrile

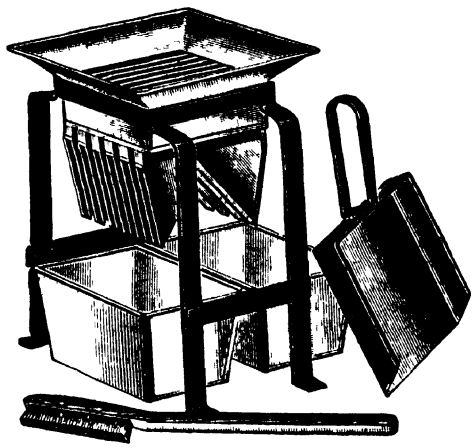
samin $C_{13}H_{14}O$ = 250 1 A hydrolysis product of sesamolin Colorless needles, m 103, soluble in chloroform

samneh Rendered butterfat from Palestine

samol Salimenthol

samphire The common name usually applied to *Crithmum maritimum* (Umbelliferae), an English herbal Its fleshy leaves are used as pickle

sample A representative portion of a substance systematically taken for the purpose of judging its quality by analysis



Sampler

sampler Riffles A device for splitting automatically aggregates of crushed ore, coal cement, or other materials preparatory for analysis See illustration

sampling Selecting something to be tested approved The taking of a sample

sand Grains or particles of disintegrated siliceous rock, chiefly of quartz **Calais-** An extremely fine sand found near Calais, used to polish platinum ware **silver-** A fine sand, washed

with hot acids and water and used for grinding up with substances prior to their extraction

s bath A vessel filled with sand in which vessels or instruments are heated in order to obtain a uniform distribution of heat It is used similarly to the water-bath, but for higher temperatures **s blast** A stream of sand projected by compressed air or steam, and used as an abrasive, metal cutter or for frosting glass **s paper** An abrasive made by coating stout paper or thin cloth with glue, and dusting fine sand on it It is intermediate in effect between glass and emery paper

sandalwood White sandalwood, santalum, white sanders The heart-wood of *Santalum album* a Santalaceae Used medicinally as the fluid extract, as a diuretic and antiseptic, and as a source of sandalwood oil and incense **red-** Red sanders, ruby wood The heartwood of *Pterocarpus santalinus*, a Leguminosae, used as a coloring material See *santalin*, *santol*, *pterocarpin* **yellow-** Yellow sanders A yellow variety of sandalwood, used as a coloring material

s oil *East Indian-* The essential oil of white sandalwood d 970–0 985 containing santalol, santalin and its esters *West Indian-* The essential oil from *Amyris balsamifera*, a Rutaceae

sandarac(h) Gum juniper sandarach The resinous substance which exudes from *Callitris quadrivalvis* (*Thuja articulata*) a pine of N W Africa

sandaracolic acid $C_{44}H_{64}O_4(OH)COOH$ = 718 6 A resinous acid from sandarac

sandix Orange-red, orange mineral A native minium, or lead oxide of a lighter color than usual, used as a pigment

Sandmeyer's reaction The replacement of an amino group by a halogen, or the transformation of diazocompounds into halogen compounds by treatment with cuprous halogen salts

$$\begin{matrix} Ph\,N & N \\ | & \\ Cl & \end{matrix} + Cu_2Cl_2 = PhCl + N_2 + Cu_2Cl_2$$

sandoptal $C_{11}H_{16}N_2O_3$ = 224 2 5-Allyl-5-isobutyl barbituric acid Colorless crystals, soluble in water used as a hypnotic

sandstone A sedimentary rock, which consists of coherent grains of sand

sang de boeuf A red pottery glaze produced by the reduction of copper oxide

sanguinaria (1) Blood root, red root, tellerwort The dried rhizomes and roots of *Sanguinaria canadensis*, a Papaveraceae It contains the alkaloids sanguinarine, homochelidonine protopine and chelerythrine (see *opium alkaloids*), used medicinally as an emetic and expectorant (2) A dark green bloodstone with red spots (3) Hematite

sanguinarine $C_{20}H_{15}O_4N$ = 333 2 An alkaloid from the root of *Sanguinaria canadensis* and *Stylophorum diphyllum* White needles, m 213 insoluble in water, soluble in alcohol or acids with red color **s nitrate** $C_{20}H_{15}O_4N\,HNO_3$ = 396 2 Orange-yellow crystals, soluble in water or alcohol, used as a tonic and cardiac stimulant **s sulfate** $(C_{20}H_{15}O_4N)_2H_2SO_4$ = 764 4 An orange-red crystalline powder, soluble in water or alcohol

sanguis draconis Dragon's blood

sanicle Sanicula

sanicula Wood march, sanicle The herb and root of *Sanicula europaea*, an umbelliferous plant It contains tannin and is used as an astringent

sanidine A glassy form of orthoclase

sanocrysin A preparation containing 37 4 % gold, used in the treatment of pulmonary tuberculosis

sanoform $C_8H_6O_2I_2$ = 404 0 Methyldiiodosalicylate $C_6H_2I_2(OH)COOMe$ A colorless crystalline powder, m 110, insoluble in water, soluble in alcohol or ether, used medicinally as a dusting powder

santal Santalenic acid **oil of-** Sandalwood oil

santalal $C_{15}H_{24}O$ = 220 2 An aldehyde, $C_{14}H_{23}CHO$, in sandalwood oil

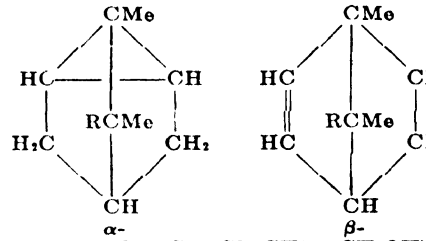
santalene $C_{15}H_{24}$ = 204 19 A terpene occurring in three forms, α- d 0 913, b 252 β- d- 0 894, b $_{7mm}$126 γ- d 0 936, b $_{10mm}$120

santalenic acid $C_{15}H_{24}O_3$ = 274 1 Santalic acid Santalin The coloring material of red sandalwood A red powder, m 104, insoluble in water soluble in alcohol or ether Used as an indicator in volumetric analysis (acids—red, alkalis—purple)

santalic acid Santalenic acid

santalin Santalenic acid

santalol (1) $C_{15}H_{24}O$ = 220 2 A terpene from sandalwood A colorless liquid (α-) Arheol



(R is $-CH_2\,CH_2\,CH\,CHMe\,CH_2OH$)

d 0 979, b 300 (β-) d 0 973, b 309 Used in the treatment of urethritis (2) Santyl **s methyl ester** Thyresol

santalum Sandalwood

santalyl The radical $C_{15}H_{23}$— **s carbonate** Carbosant **s chloride** $C_{15}H_{23}Cl$ = 238 64 A colorless liquid, d 1 040, b $_{10mm}$155 **s salicylate** Santyl

santene C_9H_{14} = 122 11 A liquid hydrocarbon, d 0 869 b 142

santenol $C_9H_{16}O$ = 140 2 *1 4-Methylene-2 2-dimethylcyclohexene-2* A colorless crystalline powder, d 0 987, m 98, b 196

santobrite C_6Cl_5ONa = 288 3 Sodium pentachlorophenate A preservative

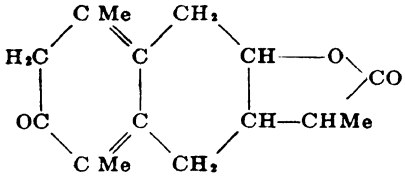
santochlor *p*-Dichlorobenzene

santol $C_8H_6O_3$ = 150 0 A colorless crystalline substance from red sandalwood

santonic acid (1) $C_{13}H_{18}O_8$ = 302 14 An acid from santonica, m 171, b $_{15mm}$285 (2) $C_{14}H_{20}O_6$ and other formulas **apo-** $C_{14}H_{20}O_2$ = 236 14 White crystals, m 164 **hydroxy-** $C_{14}H_{20}O_6$ = 284 14 Colorless crystals, decomp 215 **s lactone** Santonin

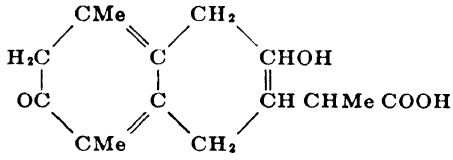
santonica Levant worm-seed, cina, xantholine, semen cinae The dried flower heads of *Artemisia pauciflora*, a Compositae It contains santonin, artemisin, essential oils, resins and gums, used medicinally as a vermifuge and diuretic Cf *cinaebene*

santonin $C_{15}H_{18}O_3$ = 246 22 The lactone of santoninic acid A neutral, non-glucosidal bitter principle from santonica Colorless, odor-



less shining leaflets, d 1 187, m 170 (sublimes and decomp), insoluble in water, soluble in alcohol, ether or chloroform Used medicinally as an anthelmintic Cf *myosin* **oxy-** Artemisin

santoninic acid $C_{15}H_{20}O_4$ = 264 2



Santonic acid Colorless crystals, d 1 251, m 179

santoninoxime $C_{15}H_{18}O_2(NOH)$ = 261 2 The oxime of santonin White, silky needles m 217, slightly soluble in water, used as an anthelmintic

santyl $C_{22}H_{28}O_3$ = 340 3 Santalyl salicylate, santalol, $C_6H_4(OH)COOC_{15}H_{23}$ A yellowish oily liquid, d 1 07 b $_{22mm}$126, insoluble in water, used medicinally as a urinary antiseptic **s methylester** Thyresol

s ap An abbreviation for apothecaries scruple = ℈

sap (1) The liquid juices of a plant especially the circulating liquids which assist growth (2) The surface portions of a rock that are softened by weathering

sapamine A higher fatty-acid N-carboxyl ester of symmetrically-substituted ethylenediamines, as, diethylamino-ethyloleamide

sapine $C_5H_{14}N_2$ = 102 2 A non-toxic isomer of cadaverine

Sapindales An order of plants which comprises the families Anacardiaceae Aquifoliaceae, Aceraceae, and Sapindaceae

sapiphores The groups or radicals in an organic compound which produce a sweet or bitter taste The sweet taste comes from a suitable combination of factors in the compound, the bitter from an unsuitable one Cf *glucophore*

sapo A soap prepared from olive oil and sodium hydroxide

sapogenin $C_{14}H_{22}O_4$ = 222 2 Sapogenol A decomposition-product of saponin Colorless needles, m 257, insoluble in water, soluble in alcohol or ether

sapogenol Sapogenin

saponaria Soaproot, soapwort, bruisewort The herb and root of *S officinalis*, a Caryophyllaceae which contains saponin and sapotoxin, used medicinally

saponarin $C_{21}H_{24}O_{12}$ = 468 19 A glucoside, m 232, from saponaria

saponetin $C_{40}H_{66}O_{16}$ = 786 5 A crystalline principle from saponaria

saponification The conversion of an ester into an alcohol and acid salt, in particular, that of fats into soaps by means of alkalis

$$(R\,COO)_3G + 3NaOH = 3R\,COONa + G(OH)_3$$
fat soap glycerol

The hydrolysis of a glycerol-ester (fat) to a free alcohol (glycerol) and ester salt (soap) **s equivalent** The quantity of fat (in grams) that is saponified by one liter of normal alkali

Sap Equ = 56108/Sap Number

s number The quantity of potassium hydroxide (in milligrams) necessary to saponify 1 gm of a fat or oil **s value** S number

saponifier The alkali used to hydrolyze fats or oils

saponify To hydrolyze an ester to form a soap

saponin $C_{30}H_{54}O_{18}$ = 726 5 A glucoside from soapwort, quillaia and other plants A white amorphous powder, soluble in water, the solution foams like soap when shaken Used medicinally and technically as a foam producer, it has toxic properties, and is also used as an antiseptic **sasanqua s** $C_{73}H_{118}O_{22}\,3H_2O$ A glucoside from the seeds of *Camelia sasanqua* a Theaceae, decomp 222, it hydrolyzes to pentose and 3 mols of galactose and prosapogenin

saponins A group of amorphous glycosides that produce foaming solutions They occur in *Saponaria* species, Hippocastanaceae, and other species of plants

saponite A native, hydrous silicate of magnesium and aluminum

sapota The dried fruit of the bully tree, *Achras sapota*, a Sapotaceae of South America It contains tannin used medicinally as an antiperiodic Cf *chicle*

Sapotaceae A natural order of tropical shrubs and trees, many of which bear edible berries, and are sources of saponin

Mimusops globosa	balata, chicle
Bumelia retusa	balata wood

Cf *butternut illipe maclayine, sapotin*

sapotalene $C_{13}H_{14}$ = 170 1 *1 2 7*-Trimethylnaphthalene Colorless crystals, insoluble in water

sapotin $C_{29}H_{52}O_9$ = 720 5 A glucoside from the seeds of *Achras* or *Sapota sapotilla*, colorless crystals, m 240

sapotinetin $C_{17}H_{18}O_{10}$ = 396 3 A decomposition product of sapotin

sapotoxin $C_{17}H_{26}O_{10}$ = 390 3 A toxin from the bark of quillaja soap bark

sappan wood Sibucao The wood of *Caesalpinia sappan*, a Philippine Leguminosae, used as a dye

sapphire A native, clear, blue corundum, Al_2O_3 used as a gem **Brazilian-** Tourmaline **water-** Iolite

saprine $C_5H_{14}N_2$ = 102 2 A ptomaine from decaying meat

sapropelic coal A coal which contains microscopic oil-bearing algae

sapropelitic Resembling coal or asphalt

saprophyte A vegetable microorganism living in air, soil or water, which feeds on dead or decaying animals or plants It differs from parasites, which feed upon living organisms

saprophytic Feeding on dead vegetable or animal organisms

saran Trade name for a polyvinylidene chloride, used to flameproof fabrics

Sarcina A genus of *Coccaceae* (Schizomycetes) which forms bale-like packs See *bacteria* (figure)

sarcine Hypoxanthine

sarcocol A gum resin from *Penaea sarcocolla*, an African Penaeaceae

sarcocollin $C_{13}H_{22}O_6$ = 275 2 A constituent of sarcocol

sarcolactate A salt of sarcolactic acid which contains the monovalent MeCHOHCOO— radical

sarcolactic acid $C_3H_6O_3$ = 90 1 p-Lactic acid, Me CHOH COOH A colorless liquid, soluble in water, alcohol or ether See *lactic acid*

sarcolite An aluminum silicate which contains lime and sodium, belonging to the melilite group

sarcosine $C_3H_7O_2N$ = 89 08 Methylglycine, sarkosine, methylaminoacetic acid, MeNH - CH_2 COOH Colorless, rhombic crystals, m - 210 soluble in water or alcohol used medicinally as an antirheumatic **dimethyl-** Betaine

sard A brown variety of sardonyx

sardine oil The fatty oil expressed from sardines, and used as leather dressing

sardinianite $PbSO_4$ A monoclinic variety of anglesite

sardonyx A variety of chalcedony, a reddish-brown slightly translucent stone Used as a semiprecious stone, as it takes a high polish Cf *sard*

sarkine Hypoxanthine

sarkokaulin $C_{13}H_{24}O_2$ = 212 19 An alcohol, m 78, from the wax of the candle bush *Sarcocaulon burmanni*, a Leguminosae of So Africa

sarkosine Sarcosine

sarracenine An alkaloid from the roots of *Sarracenia* species fly-trap or pitcher plant white needles, soluble in alcohol or ether

sarsaparilla Radix sarsae The dried root of *Smilax medica* and other species, Liliaceae It contains several glucosides (smilacin parillin) resin saponins and essential oils, used medicinally as a tonic **American-, false-** The root of *Aralia nudicaulus*, an Araliaceae **Indian-** The root of *Hemidesmus indicus*, an Asclepiadaceae **Jamaica-** Sarsaparilla

sarsasaponin A glucoside from sarsaparilla or smilax used as an emetic and expectorant

sasanqua See *saponin*

sassafras The dried bark of the root of *Sassafras varnifolium*, a Lauraceous tree of North America It contains an essential oil resin, tannin and wax used as the fluid extract as a carminative **Australian-** Atherospermine

s nuts Pichurim beans **s oil** Oleum sassafras The volatile oil distilled from the root of s (*bark*) An essential oil from the bark of *S officinalis*, d 1 065–1 095, containing safrole, eugenol, camphor, pinene and phellandrene **s pith** The dried pith of sassafras species White, spongy, cylindrical pieces used as mucilage for inflammations of the air and digestive passages

sassa gum A red gum from *Albizzia fastigiata*, a leguminous tree of Abyssinia

sassoline Sassolite

sassolite $B(OH)_3$ Sassoline A native boric acid, occurs in triclinic, lustrous scales at the fumaroles

sassy bark Mancona bark, casca bark, doom bark The bark of *Erythrofloeum guineense*, a Leguminosae of Central and Western Africa used by natives as ordeal poison It is a cardiac tonic and narcotic Cf *erythrophloeine, muavine*

satin spar A satin-like compact variety of calcite **s white** A mixture of calcium sulfate and aluminum hydroxide, produced by the co-precipitation of lime and aluminum sulphate in presence of water, used as a pigment for coating paper

saturable Able to be saturated

saturate (1) To cause all the atoms of a molecule to become saturated by having all bonds linked up, so that only single bonds exist (2) To dissolve sufficient substance, either solid or gaseous in a solution so that no more of that substance can be dissolved

saturated Completely satisfied **super-** See *supersaturated* **s compound** An organic compound with no free valence and in which there are neither double nor triple bonds **s hydrocarbons** Paraffins **s solution** A solution that contains so much dissolved substance that no additional quantity can be dissolved at that temperature

saturation (1) Complete neutralization of an acid or base (*2*) Complete or maximum absorption of a substance by a solvent (3) Complete satisfaction of the valency bonds in a molecule (4) A property of color, q v Cf *hydrogenation* **super-** See *supersaturation* **s current** The maximum current that can pass as a silent discharge through a gas or vapor without decomposing it The medium is then completely ionized **s isomerism** Isomerism between two compounds, one of which is saturated, and the other unsaturated, as acetone $CH_3CO CH_3$ and allyl alcohol, $CH_2 CH CH_2OH$ **s point** (1) The concentration at which a solution is saturated with a particular substance (*2*) In color printing, the stage at which one color becomes dominant at the expense of the other colors present

saturnism Lead poisoning

saturnus The alchemical name for lead

saunders Sandalwood

saussurite An impure form of labradorite

save Salvia

savine Sabina The fresh tops of *Juniperus sabina* an evergreen shrub It contains essential oil, tannin, and resin, used medicinally as the fluid extract, as a diuretic vermifuge, and aromatic Cf *juniperic acid* **s oil** Oleum sabinae An essential oil from *Juniperus sabina* A colorless or yellow liquid d 0 903 which contains pinene, cadinene, sabinene, and sabinol, used medicinally

savory The herb *Satureia hortensis* (summer s) and *S montana* (winter s), used as an aromatic and carminative They contain carvacrol

saw palmetto berries Sabal

saxicoles A group of lichens

saxifrage Pimpinella

saxin A brand of saccharin

Saybolt seconds A relative unit of viscosity, the time necessary for a specified volume of a liquid to flow through the orifice of a S viscosimeter at a definite temperature Cf *Engler, centipoises, SAE number, rhe*

Sb The symbol for antimony, derived from the Latin stibium

Sc The symbol for scandium

scalar Any quantity which has magnitude but no direction, e g , density, volume, mass work Cf *vector*

scale (1) A thin, plate-like crystal or flake-like leaflet (2) A crust of metallic oxides formed on the surface of metals (3) Boilerstone, or the incrustation of insoluble salts formed by the evaporation of water (4) Markings at regular intervals, either on instruments

(meter, yard, thermometer) or on drawings and graphs, as,

(5) A balance used for relative rough weighings **conversion-** A graph which consists of two or more parallel scales, that can be used for the rapid solution of proportional problems (Cf *thermometer scales, nomograph*

s copper Copper in thin flakes **s stone** Wollastonite

scaling index A measure of the degree of corrosion of a metal in a liquid, the gain in weight in mgrms per sq cm under specified conditions

scalpel A small curved knife

scammonin $C_{34}H_{56}O_{16}$ = 720 5 A glucoside derived from scammony

scammony The dried root of *Convolvulus scammonia* a Convolvulaceae of Syria and Asia minor It contains the glucoside scammonin, a gum and a resin, used medicinally as a cathartic and anthelmintic, **Mexican-** Ipomoea

scandia Scandium oxide

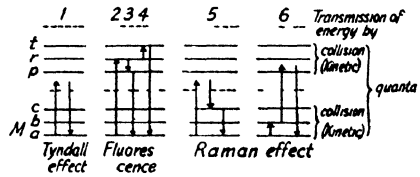
scandium Sc = 45 10 A rare metal of the aluminum group, atomic number 21 It was predicted by Mendelejeff (as ekaboron), and discovered in 1879 by Nilson It is a gray metal, m 1350, soluble in acids, valency, three **s acetylacetonate** $Sc(MeCOCHCOMe)_3$ = 342 26 White plates, m 187, b 215, soluble in water **s chloride** $ScCl_3$ = 151 5 Colorless flakes, subliming at 800°C, very soluble in water, alcohol, or ether **s hydroxide** $Sc(OH)_3$ = 96 12 A colorless amorphous powder, insoluble in water **s oxalate** $Sc_2(C_2O_4)_3\,H_2O$ = 448 28 White crystals, m 140, insoluble in water **s oxide** Sc_2O_3 = 138 2 Scandia A colorless amorphous powder, d 3 864, insoluble in water or alcohol, soluble in acids **s sulfate** $Sc_2(SO_4)_3$ = 378 41 A colorless crystalline powder, d 2 574, soluble in water

scapolite Wernerite A white or green calcium, aluminum, sodium silicate containing chlorine

scarlet Scarlet R, Biebrich red, aminoazotoluolazo-β-naphthol, $MeC_6H_4N\,NC_6H_3MeN\text{-}NC_{10}H_{15}OH$ A dark red aniline dye, a dark brown powder insoluble in water, soluble in chloroform or oils Used medicinally in ointments

scatol Skatole

scattering (1) Dispersing (2) The spitting of molten metals on pouring **light-** The emission of light from a particle or molecule under illumination, due to resonance and excitation (cf *luminescence*)



TYNDALL EFFECT, where M_0, the initial and final state of the scattering medium and $h\nu$ and $h\nu\theta$ the incoming and scattered quantum respectively, remain unchanged, except for the new direction of motion at an angle θ, hence

1 $M_0 + h\nu = M_0 + h\nu\theta$

FLUORESCENCE, where the scattered light is of shorter or longer frequency as compared with the incident light

2 (absorption) $M_a + h\nu_{ar} \rightarrow M_r$

3 (collision) $M_r \rightarrow M_p + \text{Kin } E$
(emission) $M_p \rightarrow M_a + h\nu_{ap}$
where the difference (ar) to (ap) represents the shift toward the red (Stokes lines)

4 (collision) $M_r + \text{Kin } E \rightarrow M_t$
(emission) $M_t \rightarrow M_a + h\nu_{at}$
where $h\nu_{at}$ are anti-Stokes lines

RAMAN EFFECT, where only a portion of the incoming quanta are used for excitation

5 $M_a + h\nu_0 \rightarrow M_c + h\nu_1$
where $h\nu_0 - h\nu_1 = E_c - E_a = h\nu_{ac}$

6 $M_a + \text{Kin } E \rightarrow M_b$
$M_b + h\nu_0 \rightarrow M_a h\nu_2$
where $h\nu - h\nu_0 = E_b - E_a = h\nu_{ab}$, in which case $h\nu_{ac}$ and $h\nu_{ab}$ correspond with the Raman lines

COMPTON EFFECT, where a quantum of high frequency (x-rays) dislodges an electron from the scattering substance

$$E + h\nu_0 \rightarrow E_{fast} + h\nu_1$$

scavenger A substance used to purify, as, metallic Li which will remove C, S, P, O, N and other impurities from alloys and metals

Schäffer's acid Armstrong's acid Beta-naphtholsulfonic acid, (6)$HSO_3\,C_{10}H_6\,OH$(2), or 2-hydroxynaphthalene-6-sulfonic acid, used in organic synthesis

schapbachite A native sulfide of lead, bismuth and silver, $PbS\,Ag_2S\,Bi_2S_3$

Scheele, Carl Wilhelm 1742–1786 A Swedish apothecary noted for his discovery of oxygen, chlorine, ammonia, manganese, and barium **S 's green** An acid copper arsenite, $CuHAsO_3$, used as pigment

scheelite A native calcium tungstate, $CaWO_4$

scheelium An obsolete name for tungsten

scheererite A solid mineral hydrocarbon, m 45, b 92

Scheibler, Carl 1827–1899 A German chemist noted for developments in the sugar industry **S 's reagent** A solution of phosphotungstic acid It forms a yellow precipitate with the sulfates of the alkaloids

scheme A diagram graph, flow-sheet, or an outline of a subject

schieferspar A flake-like variety of calcite

Schiff, Hugo 1834–1915 A German organic chemist **S 's bases** A series of condensation products of aromatic amines and aliphatic aldehydes of the type, R N CHR, as $PhNH_2$ + OCH Ph = PhN CHPh + H_2O **S 's reagent** Thioacetic acid **S 's solution** A solution of 0 2 gm rosaniline, and 15 cc sulfurous acid in 200 cc water used as a test for aldehydes **S 's test** A test for aldehydes, which restore the red color of a magenta solution that has been bleached with sulfur dioxide

schiller spar Bronzite

schinus oil An essential oil from the pepper tree, *Schinus molle*, an Anacardiaceae of North America, d 0 850, containing phellandrene, pinene and carvacrol

schist. A crystalline rock that can be split into scales or flakes.

schistic. Not aschistic (q.v.).

schizomycetes. Schizophyta, fission fungi, bacteria. A large group of plant microorganisms that belong to the chlorophyll-free or fungi class. They are commonly known as bacteria, and are divided into:

family 1—Coccaceae, round or spherical in shape—
genus I—Streptococci, forming bead-like chains.
genus II—Micrococci, forming grape-like clusters.
genus III—Sarcina, forming bale-like packs.
genus IV—Planococcus, like II but mobile.
genus V—Planosarcina, like III but mobile.
family 2—Bacteriaceae, cylindrical or rod-like in shape.
family 3—Spirillaceae, curved or S-like in shape. See *bacteria*.

Schizophyta. Schizomycetes.

schlempe. Vinasse.

schlieren. The region of changing refraction in an otherwise optically-homogeneous medium, (gas or liquid); *e.g.*, heat waves seen over a hot surface, or the threads seen on mixing glycerol and water.

Schlippe, Carl Friedrich von. 1799–1874. A German-born Russian chemist. **S.'s salt.** Sodium sulfantimonate, $Na_3SbS_4.9H_2O$.

Schlotterbeck reaction. The synthesis of ketones from aldehydes: $R.CHO + CH_2N_2 \rightarrow R.CO.CH_3 + N_2$. Cf. *Nierenstein reaction*.

Schmoluchowski's equation. The average length, A, of the path of a particle in a dispersed system (in μ) is:

$$A = 2.37\sqrt{K.\frac{RT}{N}.\frac{t}{\eta r}}.$$

where R = gas content, N = Avogadro's number, T = absolute temperature, t = period of vibration of the particle, η = viscosity of the medium, r = radius of the particle.

schneebergite. $CaSbO_3$. A native calcium antimonite.

Schneider's furnace. A retort for the distillation of zinc from zinc-lead ores.

schœ- See *Schoe-*.

Christian Friedrich Schoenbein.

Schoenbein, Christian Friedrich. 1799–1868. A German chemist noted as discoverer of ozone and work on catalysis, nitrocellulose and hydrogen peroxide.

Schoenherr process. A nitrogen fixation method in which the air circulates spirally around an electric arc about six meters long.

schöenite. $K_2SO_4.MgSO_4.9H_2O$. A Stassfurt salt (q.v.) which consists of hydrated potassium magnesium sulfate.

Schöllkopf's acid. (1) *1*-Naphthol-*4.8*-disulfonic acid. (2) *1*-Naphthylamine-*4.8*-disulfonic acid. (3) *1*-Naphthylamine-*8*-sulfonic acid.

schorl. Tourmaline.

Schörlemmer, Carl. 1834–1900. A German chemist, noted for his textbooks.

schorlomite. A titanium garnet, (q.v.); a native silicate of titanium, iron and calcium.

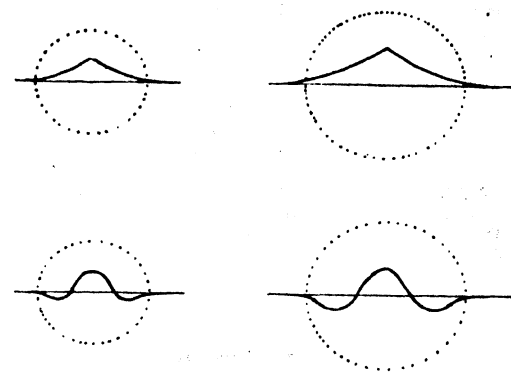
Schotten, Carl. 1853–1910. A German organic chemist noted for his synthetic methods. **S.'s reaction.** Acylation in alkaline solution with benzoyl chloride.

schou oil. A gelatinous product of the oxidation of soy bean oil, used as emulsifying agent in the margarine industry.

schraufite. $C_{11}H_{16}O_2$. A fossil resin in Carpathian sandstone.

schreibersite. $(FeNiCo)_3P$. A mixed phosphide, in certain meteorites.

Schrödinger, Erwin. 1887– . A German physicist noted for his atomic concepts. **S. atom.** Pulsating or fluctuating atom. A concept of atomic structure based on wave mechanics, q.v. The atom is regarded as a sphere of electricity which may vary slightly in its density, but which may pulsate (corresponding with Bohr's orbits) throughout the whole in either a simple or complex manner. Radiation may be absorbed or liberated by these fluctuations (energy levels). The emission of electrons is regarded as the "breaking off" of a part of the vibrations. **S. equation.** Wave equation. The differential equation



Schrödinger atoms.

$$\frac{\partial^2\psi}{\partial x^2} + \frac{\partial^2\psi}{\partial y^2} + \frac{\partial^2\psi}{\partial z^2} + \frac{8\pi^2 m}{h^2}(W - V)\psi = 0,$$

which determines the statistical charge density $\psi(x, y, z)$ or the probability that the electron may be in the volume (x, y, z). Cf. *Heisenberg principle*.

Schrötter apparatus. Calcimeter.

Schulze's rule. The precipitating effect of an ion varies with its valency.

Schumann rays. The extreme ultra-violet portion of the spectrum which affects a photographic plate. Cf. *radiation, ultra-violet*.

Schütz-Borrisow rule Enzyme activity is proportional to the square root of the amount of enzyme present $x = tK\sqrt{c}$, where x is the amount of substance digested, t = 24 hours, K is a constant, and c the concentration of the enzyme

Schwarz, Karl Leonhard Heinrich 1824–1890 A German industrial chemist, noted for volumetric methods

schwatzite A tetrahedrite containing mercury

Schweinfurt green Cupric subacetate

Schweitzer, Mathias E 1818–1860 A German chemist **S's reagent** An ammoniacal solution of cupric hydroxide, which dissolves cellulose It is prepared by adding KOH to a solution of $CuSO_4$ and NH_4Cl, and dissolving 3 gm of the moist, filtered precipitate in 1000 cc of 20 % NH_4OH

schwellenwert Liminal value threshold value The minimum quantity of electrolyte required to precipitate a colloidal solution

sciadopitene $C_{20}H_{32}$ = 272 3 A diterpene, m 95 5, from the wood oil of *Sciadopitys verticillata*, the parasol-pine, or umbrella fir of Japan

science Systematized and verifiable knowledge reached by observation, measurement and/or experiment Science primarily describes, measures and coordinates facts, but does not explain their ultimate cause (philosophy, q v) It is conveniently classified into

FORMAL BRANCHES OF SCIENCE

Logic	ideas and concepts
Mathematics	numbers and magnitudes
Geometry	space and extension
Phoronomy	motion, time and relativity

NATURAL BRANCHES OF SCIENCE

(a) experimental	
Physics	energy transformations
Chemistry	matter transformations
(b) descriptive	
Astronomy	the universe
Geology	the earth

BIOLOGICAL BRANCHES OF SCIENCE

Botany	structure and functions of plants
Zoology	structure and functions of animals
Anthropology	man
Psychology	human behavior
Economics	human relationship
Sociology	human society

scientific Based upon systematized and verifiable facts or experience Antonym empirical

scientist One engaged in the study of a branch of science

scilla Squill

scillain (1) An amorphous glucoside obtained from the bulbs of *Scilla maritima*, squill (2) Scillipicrin

scillarabiose $C_{12}H_{22}O_{10}$ = 326 1 A disaccharide obtained by acid hydrolysis of scillaren It hydrolyzes to rhamnose and *d*-glucose

scillaren $C_{37}H_{54}O_{18}$ = 706 4 A glucoside from squill, *Scilla maritima*, a yellowish powder, m 230–240, hydrolyzing to scillaradin and scillarabiose It is a cardiac tonic and diuretic **s B** A mixture of glucosides of greater physiological activity than s

scillarenase A hydrolytic enzyme attacking scillaren

scillaridin $C_{25}H_{32}O_3$ = 380 0 A cardiac glucoside related to scillin **s A** 14-OHΔ5 6-17—C(CH—O)O, CH=CH, A cholane (q v) diglycone

scillin A yellow, crystalline glucoside from the bulbs of *Scilla* species

scillipicrin Scillain A yellow, amorphous glucoside from the bulbs of *Scilla maritima*, used as a diuretic

scillitin $C_{17}H_{25}O_6$ = 325 19 A bitter principle, m 154, from the bulbs of *Scilla maritima*, squill A brownish-black mass, used medicinally as a diuretic

scillitoxin A brown, amorphous glucoside from squill, used medicinally

scintillascope Spinthariscope

scintillation (1) Burning with brilliant sparks, as an iron wire in oxygen (2) The emission or production of sparks or points of light, as, in a spinthariscope

scission (1) The splitting of a molecule, as, the breaking of a carbon atom from a chain (2) Ring breakage The opening of an atomic ring (3) Fission, the division of a living cell (see *cell division*)

Scitaminaceae An order which includes the *Musaceæ* or banana family, a group of tropical plants from which various important drugs are obtained

Zingiber officinale	ginger
Alpinia officinarum	galanga
Curcuma zedoaria	zedoary
Curcuma longa	turmeric
Elettaria cardamomum	cardamom seed
Amomum melegueta	grains of paradise
Maranta arundinaceae	arrowroot
Musa sapientum	banana, plantain

sclareol $C_{14}H_{61}O_3$ = 759 5 A tertiary unsaturated polyhydric alcohol, the principal constituent of oil of sage and similar to sterols

sclerethryrin A red coloring matter in ergot

sclero-, sklero- A prefix derived from the Greek, which indicates hard or solid **s-lac** A suggested name for the hard resin of commercial shellac

sclerometer An instrument for determining the hardness of materials from the pressure on a moving diamond point necessary to produce a scratch

scleron A light non-corrodible alloy of aluminum with Si, Cu, Fe, Mn, Zn and Li

scleroproteins A group of proteins in animal skeletons

scleroscope An instrument for determining the hardness of substances from the extent to which a steel ball rebounds after being dropped from a certain height Cf *Shore hardness*

sclerotic acid Sclerotinic acid, ergotic acid A yellowish-brown substance from ergot

scolecite $CaAl_2Si_3O_{10}\ 3H_2O$ A white or yellow mineral

scoliodonic acid $C_{24}H_{38}O_2$ = 358 3 A highly-unsaturated acid from hiragashira oil, q v

scombrin A protamine from mackerel sperm, containing 88 8 % arginine

scombron A histone from immature mackerel sperm

scoparin $C_{20}H_{20}O_{10}$ = 420 2 A yellow crystalline principle from scoparius

scoparius Spartium Broom tops The dried tops of *Cytisus scoparius*, a Leguminosae It

contains sparteine and scoparin, used medicinally, as the fluid extract, as a diuretic and purgative

scopine $C_8H_{13}NO_2$ = 155 1 *2 3*-Epoxytropan A product of hydrolysis of scopolamine, and isomer of scopoline

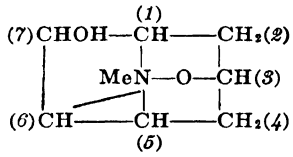
scopola The dried rhizome of *Scopola carniolica*, (Solanaceae) It contains the belladonna alkaloids, used medicinally Cf *atroscine*

scopolamine *d*-Hyoscine *l*-Atroscine **s hydrochloride** Hyoscine hydrochloride

scopoleine $C_{17}H_{21}O_4N$ = 303 2 A crystalline alkaloid from several *Scopola*, *Duboisia*, and *Atropa* species

scopoletin $C_{10}H_8O_4$ = 192 06 Chrysatropic acid, gelsemic acid, 7-hydroxy-6-methoxycoumarin, β-methylesculetin Colorless crystals, m 204

scopoline $C_8H_{13}O_2N$ = 155 1 A decomposition-product of scopolamine (hyoscine) Colorless crystals, m 110, b 242, soluble in water or alcohol



scopomannite Stable scopolamine A solution of scopolamine hydrobromide in water containing 10 % mannitol

scopometer An optical instrument with an optical wedge for visual measurement of turbidity or opalescence by observing the disappearance of an illuminated target

scopometry A branch of nephelometry (q v), matching colors or turbidities by comparing an illuminated line against a field of constant intensity

scorbutanin Vitamin C

scorification The roasting, fusion, and oxidation of gold and silver ores with lead and borax glass in a shallow clay vessel in a muffle, used in the assay of ores

scorifier A shallow clay vessel with a thick bottom, used in assaying gold and silver ores

scorodite $Fe_2O_3\ As_2O_5\ 4H_2O$ Pitticite A native, hydrated ferrous arsenate

scorodites A group of minerals of the general formula, $M_2O_3\ N_2O_5\ xH_2O$, M is ferric iron or aluminum, and N is arsenic or phosphorus

scotogram Scotograph

scotograph Scotogram, skotogram, skiagraph An image produced on a photographic plate in the dark by human radiations

scotographic Affecting a photographic plate in the dark

scotography Skiagraphy The study of human radiations, radioactivity, aura, or od-rays, q v

scotoma A spot within the visible field in which there is no vision

scouring (1) Corroding, as by certain ores that attack furnaces (2) Cleaning, as, removing the grease or stain from a vessel **s cinder** A basic slag that attacks the lining of a shaft furnace **s rush** Equisetum

scraper A tool for cleaning surfaces

scraping The cleaning of surfaces with a sharp-edged tool

scrapping Breaking up metal castings, etc with explosives or mechanically

screen (1) A sieve of wire cloth, textile or perforated metal plates, used to sort material according to the sizes of its particles (2) A stretched cloth or prepared surface on which light or images are projected (3) An apparatus with *circular* apertures as compared with **a** sieve (*square* apertures) **fluorescent-** A plate coated with calcium tungstate or barium thiocyanate, used to make visible ultra-violet rays, x-rays and other rays which ordinarily are invisible to the eye **revolving-** A steel cylinder, usually inclined, with round holes, for separating materials passing through it

s analysis The separation of **a** material into portions which consist of particles of definite sizes, by means of a series of screens of graded sizes

screening effect An assumption that a definite relationship exists between the effective nuclear charge of an atomic nucleus and the charge on its surrounding electrons, *i e*, in any atom the inner orbital electrons act as screens between the nucleus and the outer orbital electrons, and thus decrease the effective nuclear charge of the latter Hence the innermost orbital electrons exert the *largest*, and the outermost the *smallest* screening effect Cf *Pauling structure*, *Lucas theory*

scrophularia Figwort, rosenoble The herb of *S nodosa*, a Scrophylariaceae, used as a diuretic and anodyne **water-** Bishop's leaves The leaves of *S aquatica*, used externally for poultices

Scrophulariaceae Figwort family A large group of herbs and shrubs that contain glucosides and several important drugs

Leaves	
Digitalis purpurea	foxglove digitalin
Curanga amara	curangin
Euphrasia officinalis	eyebright
Verbascum thapsus	mullein
Herbs	
Veronica officinalis (speedwell)	veronica
Scrophylaria nodosa (figwort)	scrophularia
Chelone glabra (balmony)	chelonine
Rhizome	
Veronica (*Leptandra*) *virginica*	leptandra

scrubber A device for washing or absorbing gases, used extensively in chemical plants for purification dissolving, or reacting gases in or with liquids

scruff The dirt or impurities on the surface of an object Cf *scurf*

scruple ℈ A unit of apothecaries' weight 1 scruple = 20 grains = 1 295978 grams = 0 3 drachms or drams

scullcap Scutellaria

scum The impurities that rise to the surface of molten materials Cf *oly*, *froth*

scurf Material which flakes off, dross Cf *scruff*

scutellaria Scullcap, helmet flower The dried plant of *Scutellaria lateriflora* a Labiatae of North America It contains scutellarin and an essential oil, used medicinally, as the fluid extract, as an antispasmodic and tonic

scutellarin $C_{10}H_8O_3$ = 176 1 A non-toxic crystalline principle from the leaves of scutellaria Yellow needles, m 199, insoluble in water, soluble in alcohol, ether or chloroform

scyllitol $C_6H_6(OH)_6$ = 180 09 An isomer of inositol and constituent of the soap plant,

Helinus ovata, a Rhamnaceae, of South Africa, used as an emetic by the Zulus

The symbol for selenium

t salt (1) Sodium chloride obtained by evaporating sea water (2) The residual mixture of salts on evaporating sea water **s water** See *hydrosphere, water* **s weed** Kelp **s wrack** Fucus

il A quantity of water, mercury wax, oil, or other substance placed around joints or connections to prevent the ingress of air **vacuum-** The mercury surrounding joints or stopcocks

ling wax A colored and scented mixture of resins and shellac, used for sealing purposes

im A stratum or bed of a mineral or ore

bacic acid $C_{10}H_{18}O_4$ = 202 19 Ipomic acid, decanedioic acid*, *1 8*-octane-dicarboxylic acid, $COOH(CH_2)_8COOH$ Colorless leaflets m 133, α_{100mm} 295, soluble in water, alcohol or ether

(1) An abbreviation for second, a unit of time (2) An abbreviation for secondary 3) Dry

ale cereale Rye **s cornutum** Ergot

aline Trimethylamine

alonic acid $C_{14}H_{14}O_6$ = 278 1 A yellow, crystalline coloring material found in ergot

alose A carbohydrate from rye A white, hygroscopic powder Cf *trifructosan*

achi, Angelo 1818–1876 An Italian Jesuit and astronomer noted for spectrum analysis and polaroscopic experiments

hometer A hand-driven induction apparatus

ohm A unit of self inductance, 1 ohm per second

ond sec The $\frac{1}{60}$ part of a minute, 1/86,400 09 of a sidereal day, 1(24 × 60 × 60) of a mean solar day 1 second = 1000σ (sigma) = 3 168876 × 10^{-8} year **s ionization constant** See *ionization constant*

ondary (1) Second in order (2) Next in importance **s alcohol** An organic compound which contains the bivalent —CHOH radical **s amine** An organic compound containing the bivalent —NH radical **s carbon atom** A carbon atom that is directly attached to two other carbon atoms **s metal** Metal recovered from scrap, sweepings, skimmings, drosses, etc This does not imply inferiority, but distinguishes from primary m , made directly from an ore) **s mineral** A mineral that is formed from a primary mineral, as, a sulfate formed by oxidation of the sulfide **reaction** Subsidiary *reaction* **s x-rays** The scattered radiations emitted from a substance exposed to x-rays They are characteristic of the substance and are used for analytical purposes

retin A polypeptide containing P, tyrosine, etc , from the intestinal mucosa of the pig, and from plants, slightly soluble in water, insoluble in alcohol It acts on the secretion of the pancreas and liver, and excites peristalsis Cf *hormone*

retion The formation and separation of a definite substance, other than a waste material, from a living organism or organ, as, resins from plants, serum from wounds, hormones from glands

tion A thinly-cut piece of a substance for microscopic study **histological-** A thin cut of plant or animal tissue **metallographic-** A thin cut of an alloy or metal

sector The area included between an arc and two radii

sectrometer A vacuum tube titrimeter for potentiometric titrations, in which a cathode ray tube replaces the micro-ammeter and the end-point is a sudden permanent change in the shadow angle on a fluorescent screen Cf *titrimeter, potentiometer*

securite An explosive not ignited by fire-damp and used in mines It contains ammonium nitrate and oxalate, and di-nitrobenzene

sedanolid $C_{12}H_{18}O_2$ = 194 14 The lactone of sedanolic acid, a constituent of celery seeds, *Apium graveolens*

sedanonic anhydride $C_{12}H_{18}O_3$ = 210 14 A white powder from celery seeds

sedatin Valeridin

sedatine Antipyrine

sedative An agent that has a calming effect and counteracts stimulation, irritation or excitement, as, bromides Antonym stimulant

sediment A deposit of an insoluble material, especially if settled by gravitation Cf *precipitate, sedimentation settling*

sedimentary rock A rock formed by the accumulation of grains or fragments of rock carried by water or air

sedimentation The precipitation or settling of insoluble materials from a suspension, either naturally (by gravity) or artificially (by a centrifuge) **rate of-** See *settling, Stokes law* **free s** S in which the particles exert no mutual interference Stokes law then applies **hindered s** The opposite of free s

sedoheptose $C_7H_{14}O_7$ = 210 1 A heptoketose from *Sedum* species

sedormid $C_9H_{16}N_2O_2$ = 184 12 Allyl-isovalerylurea A white powder, used as a hypnotic

sedum The herb of *Sedum acre*, a Crassulaceae which contains alkaloids, carbohydrates, and a mucilage used externally for wounds

Seebeck, Thomas Johann 1770–1831 A German physicist, discoverer of thermoelectricity and the magnetism of cobalt and nickel

seed lac See *lac*

seeds The product of fertilized and developed ovules of plants They are usually rich in proteins carbohydrates and oils, and are an important source of food, *e g* , those of Gramineae (grains) and Leguminosae (peas and beans) Some of the seeds are official, medicinally (See *fruits*)

Bitter almond	Physostigma
Black mustard	Pumpkin seed
Cacao	Staphisagria
Cardamom	Stramonium
Colchicum	Strophanthus
Linseed	Sweet almond
Nux vomica	White mustard
Nutmeg	

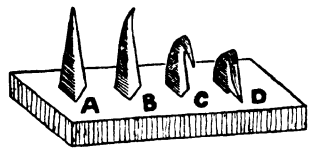
seekay wax C K *wax*

seepage (1) The percolation or oozing of a fluid through a porous material, also the fluid which collects as a result of it (2) The separation of two phases

Sefström, Nils Gabriel 1787–1845 A Swedish chemist and mineralogist, noted for the discovery of vanadium

Seger, Hermann A 1839–1893 A German technologist noted for ceramic research **s cones** Pyrometric cones Small pyramids of various clay and salt mixtures, used to indi-

cate the temperature of a furnace Each cone softens at a definite temperature, ranging form 500°C to 2000°C



Seger cones

seggar Clay boxes in which ceramics are kilned

segregate To separate

Seidlitz powder An effervescent mixture of potassium sodium tartrate, sodium bicarbonate and tartaric acid, used for making an alkaline mineral water

Seignette's salt Potassium sodium tartrate

seismometer An instrument for recording shocks (*e g* , due to distant earthquakes)

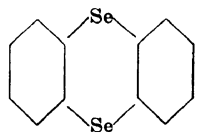
sekisanine $C_{34}H_{34}O_9N_2$ = 614 3 Dimethylhydroxy-lycorine A physiologically inactive alkaloid from the bulbs of *Lycoris radiata*, an Amaryllidaceae, colorless prisms Cf *lycorine*

see Salt **s mixte** A natural mixture of NaCl and $MgSO_4 7H_2O$, deposited in the salt lakes of the Volga regions, U S S R

selacholeic acid $C_{24}H_{46}O_2$ = 366 3 Nervonic acid, 6 15-tetracosenoic acid* A fatty acid, $Me(CH_2)_7CH\ CH(CH_2)_{13}COOH$, from shark liver oil

selachyl alcohol $C_{21}H_{42}O_3$ = 342 3 A liquid glyceryl ether, $C_{18}H_{35}OC_3H_5(OH)_2$, from shark liver oil Cf *batyl, chimyl*

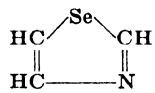
selenanthrene $C_{12}H_8Se_2$ = 310 4



Cf *thianthrene*

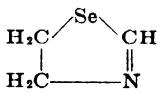
selenate A salt of selenic acid, M_2SeO_4

selenazole C_3H_3NSe = 132 18 The pentatomic ring,

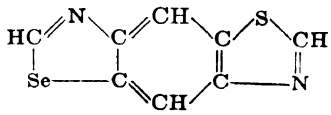


It is known only as its derivatives

selenazoline C_3H_5NSe = 134 18 The pentatomic ring compound,



selenazolobenzothiazole The heterocyclic compound,



selenic A compound of tetravalent or hexavalent selenium **s acid** $H_2SeO_4[xH_2O]$ = 145 2 An isolog of sulfuric acid Colorless, hexagonal prisms, d 2 95, m 58, b 260, soluble in water, alcohol or ether Its salts are the selenates

selenide A binary compound of divalent selenium of the type, M_2Se, or an organic compound containing divalent selenium, =Se **di-** A compound of the type R Se Se R Cf *disulfide* **hydro-** A compound containing the monovalent HSe— radical Cf *selenyl*

selenimic acid* An organic compound having a $—SeO_2H$ radical, as, $PhSeO_2H$, benzene selenimic acid Cf *selenonic acids*

selenino The monovalent radical, (HO)OSe—, derived from selenious acid Cf *selenono*

selenious Selenous A compound containing divalent or tetravalent selenium, as, $SeCl_2$, SeO_2 **s acid** H_2SeO_3 = 129 2 A colorless crystalline powder, d 3 065, decomp by heat, soluble in water, alcohol or ether Its salts are the selenites **s oxide** Selenium dioxide

selenite (1) A salt of selenious acid of the general type, M_2SeO_3 (2) $CaSO_4 2H_2O$ A native gypsum

selenium Se = 78 96, or Se_8 = 631 68 A nonmetal of the sulfur group, and element atomic number 34 It occurs in several modifications (a) *metallic* A hexagonal, gray, crystalline powder, d 4 80, m 217, b 690, insluble in water, carbon disulfide, or alcohol, soluble in ether or conc sulfuric acid (b) *crystalline* A dark red, monoclinic, crystalline powder, d 4 47, m 180–200, soluble in carbon disulfide (c) *amorphous* or liquid (*i e* , supercooled) A red amorphous powder obtained by precipitation, d $_{20}$*4 26, m 100, soluble in carbon disulfide (d) *colloidal* A red solution, which slowly deposits amorphous selenium Selenium was discovered in 1817 by Berzelius in the lead chambers of a sulfuric acid plant It burns with a blue flame and garlic-like odor to its dioxide SeO_2 It has a valency of 2, 4, and 6, and forms the following series of compounds,

valence number	−2	0	+4	+6
ion or radical	Se^{--}	Se	SeO_3^{--}	SeO_4^{--}
name of compounds	selenides	selenium (element)	selenite	selenates
		——Oxidation——→		
		←——Reduction——		

The electrical resistance of metallic selenium decreases with the intensity of illumination, and it is used for s cells (q v) and the optophone (q v), also for making red glasses, enamels and glazes, and in insecticides (selocide)

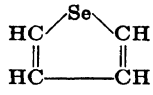
s bromide (1) Se_2Br_2 = 318 2 S monobromide A dark red liquid, m −46 (2) $SeBr_2$ = 239 0 S dibromide A brown liquid (3) $SeBr_4$ = 398 8 S tetrabromide Orange-red crystals, soluble in carbon disulfide **s cell** An arrangement of metallic s plates enabling electricity or sound to be transmitted by means of light, or vice versa, the electrical resistance of the cell varies according to its exposure to light of different intensities Used in telephotography and radiophotography **s chloride** (1) Se_2Cl_2 = 229 4 S monochloride Brown crystals (2) $SeCl_2$ = 150 1 S dichloride, selenous chloride A brown oily liquid (3) $SeCl_4$ = 221 0 S tetrachloride, selenic chloride Yellow crys-

ride See *s chloride* **s diethyl** $SeEt_2$ = 137 3 Ethylselenide, $Se(C_2H_5)_2$ A colorless liquid, b 108, insoluble in water, soluble in ether **s dimethyl** $SeMe_2$ = 109 3 Methylselenide, $Se(CH_3)_2$ A colorless liquid, b 58, insoluble in water, soluble in ether **s dioxide** See *s oxide* **s hydride** Hydrogen selenide **s iodide** (1) Se_2I_2 = 412 2 S monoiodide A brown solid, m 65, decomp by water (2) SeI_4 = 586 9 S tetraiodide, selenic iodide A green solid, m 77, decomp by water **s monobromide** See *s bromide* **s monochloride** See *s chloride* **s monoiodide** See *s iodide* **s nitride** Se_2N_2 = 186 4 An amorphous yellow solid, explodes at 200°C, insoluble in water, soluble in carbon disulfide **s oxide** SeO_2 = 111 2 S dioxide, selenious acid anhydride A colorless, crystalline powder, d 3 954, sublimes at 260°C, m 390, decomp by further heat, soluble in water, alcohol, ether, acids or alkalis **s oxides** A group of organic compounds which contain the divalent =SeO radical, as Me_2SeO **s oxychloride** Selenyl chloride **s sulfide** SeS = 111 3 A yellow solid, d $_0$°3 06, m 118, insoluble in water, soluble in ether or carbon disulfide

seleno The divalent atom, =Se Cf *sulfo, telluro, keto* **s diphenylamine** Phenoselenazine **s furan** See *selenofuran* **s naphthene** Benzoselenofuran

selenocyano The monovalent radical NCSe—

selenofuran C_4H_4Se = 131 2 Selenophene The pentacyclic compound,



A colorless mobile liquid, m −38, b 109 9, insoluble in water, soluble in acetone or benzene It resembles thiophen and burns in air with a blue flame, forming selenium

selenoid Solenoid A hollow cylinder, wound with resistance wire and used for producing fields of electric force

selenole See *piaselenole, tolupiaselenole*

selenomercaptan An organic compound of the type R SeH

selenonic acids* A group of organic compounds which contain the monovalent —SeO_3H radical, analogous to sulfonic acids, as $MeSeO_3H$, methane selenonic acid Cf *selenınic acid*

selenonium Tetravalent selenium, as in $RSeH_3$ Cf *-onium*

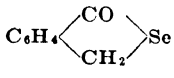
selenono The monovalent radical, HO_3Se—, derived from selenic acid Cf *selenino*

selenonyl The divalent radical —SeO_2— Cf *sulfuryl*

selenophene Selenofuran

selenophenol C_6H_6Se = 157 25 PhSeH A colorless liquid, d 1 487, b 183

selenophthalide C_8H_6OSe = 197 2 The heterocyclic compound



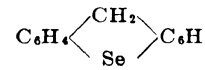
Colorless crystals, m 58, soluble in alcohol

selenopyronine Selenoxanthene

selenotungstate A salt containing the green =WSe_4 radical, as $(NH_4)_2WSe_4$ **di-** A salt containing the red =WSe_2O_2 radical, as, $(NH_4)_2WSe_2O_2$

selenous Selenious

selenoxanthene Selenopyronine $C_{13}H_{10}Se$ = 245 2



selenoxanthone 9-Keto selenoxanthene

selenurea NH_2 CSe NH_2 **pseudo-** HSe C - NH NH_2

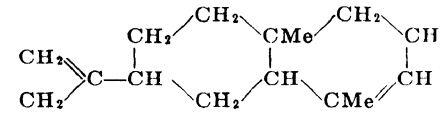
seleniretted A substance impregnated or combined with hydrogen selenide

selenyl (1) The monovalent radical HSe— (2) The divalent radical, =SeO **s chloride** $SeOCl_2$ = 166 1 Selenium oxychloride A colorless liquid, m 10, b 180, decomp by water

self-inductance The e m f produced in a circuit by a unit rate of variation of the current passing through it

self-induction A change in the magnetic field of a conductor, produced by a variation in the current passing through it

selinene $C_{15}H_{24}$ = 204 2 A sesquiterpene from celery seed oil A colorless liquid, b $_{16mm}$135, d 0 914, soluble in alcohol



sellaite MgF_2 A native magnesium fluoride

selocide An insecticide made by dissolving selenium in potassium ammonium sulfide solution equivalent to 30 % $(KNH_4S)_2Se$ For sprays it is diluted 100–200 times with soap water

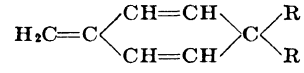
selwynite Yellow *ocher*

semecarpus Marking nut, Oriental cashew nut, acajou nut The fruit of *S anacardium*, an East Indian Anacardiaceae Its acrid juice is used as a black stain

semen The fecundating fluid of the male See *Florence test*

semi- A prefix derived from the Latin, indicating "half" = hemi (Greek) = demi (French)

semibenzenes A group of compounds of the type



semicarbazide CH_5ON_3 = 75 1 Hydrazine carboxamide, aminourea, carbamyl hydrazine An amide and hydrazide of carbonic acid, NH_2 NH CO NH_2 Colorless, fine prisms, 1 2 3 4 m 96, soluble in water, alcohol, ether or benzene Used as a reagent for aldehydes and ketones, and in organic synthesis **4-amino-** Carbohydrazide

s hydrochloride CH_5ON_3 HCl = 111 5 Amidourea hydrochloride Colorless prisms, m 175, soluble in water or alcohol, insoluble in ether, used in organic synthesis, and as reagent for aldehydes and ketones

semicarbazido The monovalent group, NH_2 - CO NH NH—

semicarbazone* A condensation-product of aldehydes or ketones and semicarbazide, of the general type R_2C N NH CO NH_2, as, $(CH_3)_2$- C N NH $CONH_2$, propane (or acetone) semicarbazone

semicoke A fuel made from coal by low temperature carbonization at 1100°F, it burns smokelessly with very little ash

semiconductor A substance which allows the passage of current in one direction only, and therefore, can be used as a rectifier, *e g*, cuprous sulfate, galena

semidines A group of aromatic amines of the type, $R\,C_6H_4\,NH\,C_6H_4\,NH_2$ According to the position of the NH_2-group, they are termed ortho- or para-semidines **s rearrangement** A special type of benzidine re-arrangement (q v) in which only one half of the molecule is supposed to rotate, as,

$$R\,C_6H_4\,NH\,NH\,C_6H_4\,R \rightarrow R\,C_6H_4\,NH\,\dot{C}_6H_3RNH_3$$

semi-drying oils Fatty oils which thicken slowly on exposure to light and air

semi-metal An obsolete name for an element (such as arsenic), which is midway in properties between metals and non-metals

seminase An enzyme in alfalfa

seminose d-Mannose

semiopal A native silica

semipermeable Permitting the passage of certain molecules, and hindering the passage of others **s membrane** A diaphragm or septum through which certain substances pass, while others are retained, as a cell membrane, parchment, or artificially-treated porous cups (See *osmosis*)

semiprecious A gem or metal used for decorative purposes, which is inferior to the precious grades

semisilica brick A fire-brick made from a siliceous clay, or from a mixture of fireclay and ganister, and containing 80–92 % silica

semisolid Soft and slowly flowing, as, asphalt

semivalence A mono-electronic link between two rigid systems, built up from two octets or two closed electronic systems It is characteristic of unstable intermediate, addition compounds formed during certain reactions, and is less stable than the ordinary non-polar bond (bi-electronic link)

Semmler, Friedrich Wilhelm 1860–1931 A German organic chemist noted for his work on the constitution of essential oils

senarmontite A native antimony trioxide, Sb_2O_3

seneca oil Petroleum

senecifolic acid $C_{10}H_{16}O_6$ = 232 1 The acid product of hydrolysis of senecifoline

senecifolidine $C_{18}H_{21}NO_7$ = 367 2 An alkaloid from *Senecio latifolius* Rhombic plates, m 212

senecifoline $C_{18}H_{27}NO_8$ = 385 22 An alkaloid from *Senecio latifolius*, a Compositae of South Africa Colorless rhombic plates, m 194, soluble in ether or chloroform **s hydrochloride** $C_{18}H_{27}NO_8\,HCl$ = 421 68 White crystals, m 260, soluble in water

senecifolimine $C_8H_{11}NO_2$ = 153 1 A basic hydrolysis product of senecifoline

senecine An amorphous, alkaloid from *Senecio vulgaris*

senecio Life root, ragwort squaw-weed The dried herb of *Senecio aureus*, used as the fluid extract, as a tonic and diuretic **s alkaloids** A group of alkaloids from s, as, jacobine, necine, retronecine, retrorsine, senecifoline, senecifolidine, senecionine

senecioic acid $C_5H_8O_2$ = 100 06 Isopropylidene acetic acid, β-methyl-α-butenoic acid, β-methylcrotonic acid, $Me_2C{=}CH\,COOH$ An isomer of tiglic acid

senecionine $C_{18}H_{25}NO_6$ = 351 2 An alkaloid from *Senecio vulgaris*, groundsel, a Compositae

senega Senega snakeroot Rattlesnake root The dried root of *Polygala senega*, a Polygalaceae It contains senegin and polygalin, used medicinally as the fluid extract

senegenin $C_{26}H_{44}O_6$ = 452 4 Senegenimic acid A dibasic acid hydrolysis product of senegin A colorless powder, m 272

senegenimic acid Senegenin

senegin (1) $C_{32}H_{52}O_{17}$ = 708 4 A saponin derived from senega (2) $C_{20}H_{32}O_7$ = 384 2 A hydrolysis product of (1) Cf *senegenin*

seneski A natural coke resulting from the intrusion of igneous basaltic rock into a coal seam It contains 20 % ash, and is used to produce water gas

senna The dried leaflets of *Cassia acutifolia* (Alexandria s) or *Cassia angustifolia* (India s), a leguminous plant It contains glucosides, acids and resins, used as the fluid extract, as a cathartic **American-** The leaves of *C marilandica* **wild-** See *globularesin*

sennatin An active principle from senna leaves

sensibilizer (1) An agent that renders an enzyme active (2) An amboceptor

sensitive (1) Responding readily to a test or force (2) See *anaphylaxis*

sensitiveness (1) The degree of accuracy of a test or instrument the most exacting conditions under which it responds (2) The speed with which light acts on a photographic plate (3) The property of explosives to explode by mechanical shock

sensitization (1) In biochemistry, the process of rendering a cell sensitive to the action of a complement by treating it with a specific amboceptor (2) In photography (a) the coating of a surface with light-sensitive emulsions, as, silver salts, (b) rendering the photographic emulsion more sensitive by the addition of dyes which absorb certain portions of the spectrum (3) The treatment or impregnation of paper with chemicals in such a way that ink writing cannot be eradicated without producing a telltale stain or mark

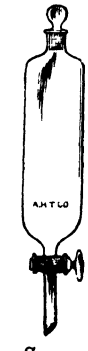
sensitizer (1) A trace of a substance, other than the catalyst, which promotes a catalytic action (2) In biology Amboceptor, opsonin, or tropin A specific substance which occurs in small quantities in serum, and in larger quantities during immunization Cf *Ehrlich side-chain theory* (3) In photography, an aniline dye that increases the sensitiveness of the emulsion to certain lightwaves See *photosensitizer*

separating fluid A liquid used to separate materials of different density, q v

separator A device or machine for separating materials of different densities by the aid of air or water It differs from a concentrator in that the latter saves one material and rejects the rest, whereas, the separator saves both materials (See *centrifuge, electric precipitator accumulator*)

separatory funnel A tap-funnel or device for separating two immiscible liquids (see illustration)

sepia The dried inky juice of a cuttlefish or squid, used as a pigment or dye Cf *chromogen*

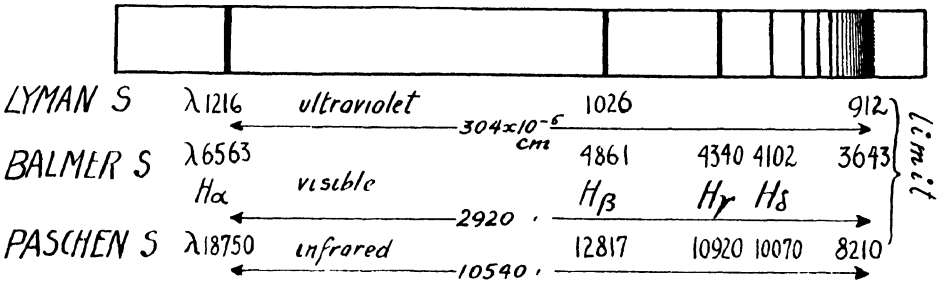


Separatory funnel

sepiolite A native hydrated magnesium silicate similar to meerschaum (q v)
sepsine $C_5H_{14}N_2O_2$ = 134 1 A ptomaine from decaying yeast
sepsis Poisoning produced by microorganisms or putrefactive substances Cf *asepsis*
septavalent Septivalent, heptavalent Possessing a valency of seven, as Cl in perchlorates, Mn in permanganates
septic Pertaining to putrefaction
septicemia Blood poisoning A morbid condition caused by the presence of pathogenic bacteria and their waste products in the blood
septivalent Septavalent
septurit A molecular compound of sulfanilamidine and hexamine Used to treat infected wounds
sequiatannic acid Sequoia tannin
sequoia tannin $C_{21}H_{20}O_{10}$ = 432 2 A tannin from the cones of *Sequoia gigantea*, the mammoth tree of California A red-brown powder, soluble in water or alcohol
seralbumin The albumin of the blood
serendipty Intelligent curiosity Ability to make unexpected discoveries
serenoa Sabal
serge blue Methylene blue
sericin $C_{15}H_{25}O_7N_5$ = 323 5 Silk gelatin silk glue An amorphous substance obtained from silk, q v
sericite A flaky form of muscovite, causing silicosis
series A succession or a group of compounds, objects or numbers, arranged systematically according to a rule See *progression* **aliphatic-** See *aliphatic compounds* **alkane-** See *methane s* **alkene-** See *ethylene s* **alkine-** See *acetylene s* **analogous-** See *analogs* **aromatic-** See *aromatic compounds* **Balmer-** The hydrogen lines, H_α, H_β, H_γ , which correspond with an electron transition from the third, fourth, fifth, , orbit to the second orbit Cf *hydrogen atom, Bohr theory* **benzene-** See *benenze series* **chemical-** See *s of compounds* **diffused-** The spectrum lines resulting from a transition from the p state to the d state, they are denoted by 1p-md, where m is the integer denoting the order in the series **displacement-** q v **electrical-** (1) See *electromotive force* (2) See *s of cells* **ethylene-** See *olefines* **fatty-** See *methane series* **fuzzy-** The spectrum lines caused by transit from the outermost or f orbit, q v **galvanic-** See *galvanic battery* **geologic-** See *geologic era* **homologous-** A group of compounds differing from one another by a definite radical or atomic group, as, CH_2 **homotopic-** The elements in a group or family of the periodic system **isologous-** See *isologous* **isotopic-** The isotopes of an element **isomorphous-** See *isomorphism* **isotropic-** See *isotopes* **isosteric-** See *isosteres* **K-** See *K radiations* **Lyman-** The hydrogen lines in the ultra-violet portion of the spectrum, due to a transition of electrons from the second, third, orbit to the first orbit Cf *energy levels* **methane-** See *methane series* **Paschen-** The hydrogen lines in the infra-red portion of the spectrum, due to a transition of electrons from the fourth, fifth, orbit to the third orbit Cf *energy levels* **periodic-** See *periodic system* **principal-** The spectrum lines caused by a transition from the p state to the lowest or s state, it is denoted by 1s-mp, where m indicates a particular line in the series, as 1s-3p, the third line Some of these lines are produced by a bunsen flame Cf *Rydberg's formula, Bohr atom, orbital state, spectrum* **radioactive-** See *radioactive elements* **sharp-** The spectrum lines produced by an electronic transition from the p state to the s state, they are denoted by 1p-ms
s notation See *quantum numbers* **s of cells** A galvanic or electric s in which the electric cells are arranged successively so that the anode of one is connected with the cathode of the other

+ − < > − < > − < > − −

It differs from connection in "parallel" **s of compounds** A group of compounds of an element, whose valency is the same throughout Thus, elements that possess more than one valency form a corresponding number of series of compounds, *e g* iron forms the ferrous and ferric series of salts sulfur forms the sulfide, sulfite or sulfate series of compounds **s of lines** See *Balmer-, Lyman, Paschen s , quantum theory atomic structure Ritz formula*



Hydrogen spectrum showing series of lines

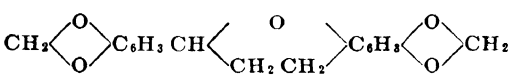
serine $C_3H_7NO_3$ = 105 1 α-Amino-β-hydroxypropionic acid, hydroxyalanine, CH_2OH-$CHNH_2COOH$ A colorless crystalline powder from sericin and horn It is a constituent of many proteins, m 246 (decomp), insoluble in alcohol or ether
serogan The follicle-stimulating sex hormone from pregnancy urine
serology The study of immunity reactions in serum, or the action of sera
seroreaction A reaction which occurs in a serum as a result of immunization
serozyme Thrombogen
serpentaria Virginia snakeroot The dried rhizome and roots of *Aristolochia serpentaria* and other species of the Aristolochiaceae family, used medicinally as a tonic and stimulant
serpentine $Mg_3Si_2O_7\,2H_2O$ A hydrous magnesium silicate, green massive or lamellar masses in rocks It often contains ferrous oxide Cf *ophiolite*

serum [plural sera] (1) The clear liquid portion of a body fluid (2) The clear, amber, alkaline fluid of the blood from which the cellular elements have been removed by clotting It contains the salts, soluble proteins and carbohydrates, used in biochemical and therapeutic work (See *immune serum*, *normal serum*, *immunity*) **milk-** Whey

s albumin A protein, molecular weight 45,000, from s and nephritic urine **s globulin** A protein closely associated with s albumin

sesame oil Benne oil The oil extracted from the seeds of *Sesamum indicum* and other species, Pedaliaceae, d_{25}°0 917, used as an olive oil substitute Cf *bromipin*, *iodipin*, *Villavecchia test*

sesamin $C_{18}H_{16}O_5$ = 312 0 The aromatic ether



Colorless crystals, d 1 305, m 122 7, slightly soluble in alcohol Sesame oil contains 1 % of s

sesamol $C_7H_6O_2$ = 138 1 A phenolic hydrolysis-product of sesamolin, it is responsible for the Baudouin color test

sesamolin $C_{20}H_{18}O_7$ = 450 1 A substance in sesame oil (0 3 %), m 93 6, which hydrolyzes to sesamol and samin

sesqui- A prefix derived from the Latin and indicating "one and one-half", *i e*, the proportion of two of one radical or element to three of another

sesquicarbonate A compound of carbonic acid and a base in the proportion of three to two, *i e*, an acid salt of carbonic acid **s of soda** $NaHCO_3\,Na_2CO_3\,2H_2O$ Sodium sesquicarbonate Snowflake crystals The double salt, used extensively in industry as a neutralizing agent, in the manufacture of soap, glass, paper and cleansers

sesquichloride A compound of chlorine and metal in the proportion of three to two, as Fe_2Cl_3

sesquioxide A binary compound of oxygen and a metal in the proportion of three to two, as, Al_2O_3, Fe_2O_3

sesquisalt A compound of an acid and base in the proportion of three to two as, $Fe_2(SO_4)_3$

sesquisoda A molecular mixture of $NaHCO_3$ and Na_2CO_3

sesquiterpenes A group of terpenes of the general formula, $C_{15}H_{24}$ or $(C_{10}H_{16})_2^3$, as, cadinene clovene, santalene

SESQUITERPENES

$C_{15}H_{24}$	atractylene	gujene
	cadinene	patschoulene
	cannibene	santalene
	caryophyllene	selinene
	cedrene	zingiberene
	clovene	
$C_{15}H_{26}$	elemene	ferrulene

set-off The transfer of ink from a printed to an unprinted surface by direct contact, it arises from the slow drying of the ink

setting The hardening of semi-liquid mixtures on crystallization (as cement or plaster of paris), or on condensation (as organic mixtures)

settler A separator or tank in which insoluble material from a solution is deposited and sinks to the floor

settling The precipitation of insoluble materials held in suspension in a liquid, and their gradual accumulation at the bottom of the vessel by gravitation **hindered-** S which is prevented by some factor other than specific gravity **rate of-** The velocity of fall of particles in a liquid If the solid falls so slowly that the liquid flows past it in stream lines, the velocity is expressed by Stokes' law If the particle is large and causes eddying motion in the liquid, the velocity, v, is expressed by

$$v = k\frac{\sqrt{D(S-s)}}{s},$$

where D is the diameter of the particle, S and s the specific gravity of solid and liquid, respectively, and k a constant (9 3 for spheres, 9 for irregular particles) Cf *Stokes' law*

set-up The working arrangement of instruments, glass-ware and other implements properly connected and ready for the performance of a chemical experiment or determination

sewage The domestic waste from lavatories, kitchens, bathrooms, stables, and industrial plants

sewerage A system of pipes for carrying off excreta and waste-materials

sewer gas The gases arising from decomposition of sewage

sexiphenyl $C_{36}H_{26}$ = 458 2 Hexaphenyl, a hydrocarbon which consists of a chain of six benzene rings, $Ph(C_6H_4)_4Ph$ Colorless crystals, m 475 b 350, insoluble in water

sexivalent (1) Having six different valencies (2) Hexavalent

sextate Methyl cyclohexanol acetic ester

sextol Cyclohexanol

seybertite A complex hydrated native iron, calcium, aluminum silicate

sfax A variety of esparto (q v) from North Africa near Sfax

shale A fine-grained sedimentary rock, with splintery uneven fractures Cf *slate* **alum-** q v **oil-** q v **s naphtha** A petroleum obtained from shale **s oil** A crude oil obtained from bituminous shales by destructive distillation Its chief constituent is *kerogen* Cf *oil shale*, *gabrianol* **Esthonian-** Kukersite **s spirit** The lower-boiling fractions obtained on distilling shale oil

shallu Durra

shearing Side-cutting or a lateral motion, as in grinding (Differing from a vertical motion, as crushing)

sheave A grooved pulley-wheel

sheep The herbiverous mammal, *Ovis aries*, providing, meat, wool, leather and endocrine glands **s dip** An antiseptic dipping fluid for sheep It usually contains arsenic or phenols and cresols **s laurel** Kalmia **s sorrel** The dried herb of *Rumex acetosella*, used medicinally, as the fluid extract, as a refrigerant and diuretic

sheerness The combined qualities of transparency, surface gloss and smoothness, as applied to rayon articles

Sheffield plate Copper goods plated with a thicker layer of silver than for electroplate A sheet of silver is laid on a sheet of copper, and both are fused together by heat The silver-

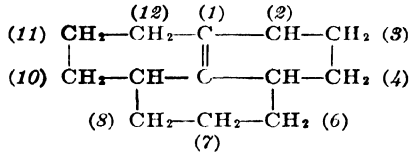
surfaced copper is then rolled out and worked into articles of desired forms The art was discontinued on the discovery of electroplating in 1837

shell (1) A husk of a fruit (2) The calcareous or siliceous covering of marine invertebrates (3) A projectile filled with explosives (4) An area surrounding an atomic nucleus in which electrons are situated Cf *Lewis atom, periodic chain* **s lime** A fertilizer obtained by grinding mollusks containing 90 % $CaCO_3$ (or $MgCO_3$) **s marl** A fertilizer obtained by grinding natural deposits of shells containing not less than 80 % $CaCO_3$ (or $MgCO_3$)

shellac The purified resin lac (q v) obtained from various plants by the incisions of an insect, *Laccifer lacca* (*Coccus lacca*) Thin, yellowish-brown leaflets, insoluble in water, soluble in alcohol, used extensively in varnishes, polishing materials, sealing wax, and in pyrotechnics It contains 30 % aleuritic acid and 35–38 % resin acid mixture **earth-** Acaroid resin

shellane (1) A compressed natural gas, shipped in cylinders as fuel (2) $C_{11}H_{22}$ = 178 1 The saturated hydrocarbon corresponding with shellene

shellene $C_{13}H_{20}$ = 176 1 The hydrocarbon



shellolic acid $C_{15}H_{20}O_6$ = 296 14 *10*-Hydroxy-shellene-*1 12*-dicarboxylic acid Colorless crystals, m 200, decomp 203, soluble in hot water or alcohol

shepherd's purse The freshly-gathered green herb of *Capsella Bursa-pastoris* Used medicinally as a stimulant, as the fluid extract

sherardize To galvanize articles by covering them with zinc dust and heating in a tightly-closed retort Cf *calorizing*

sherbet (1) An effervescing drink, sold in powder form, consisting of sugar, sodium bicarbonate, tartaric acid and flavoring materials (2) A frozen fruit-juice used as a dessert

Sherman settler A series of cylindrical tanks which, as they decrease in depth, increase in width Used for settling out suspended materials from liquids

shibuol $C_{14}H_{20}O_9$ = 332 15 A phenol obtained from kaki shibu, the unripe kaki fruit of Japan Used in water-proofing paper

shift (1) A slight change in the wave length of a spectral line caused by (a) density (cf *pressure*), (b) mass (cf *relativity*), (c) motion (cf *Döppler effect*), (d) absorption (cf *Compton effect*), (e) reflection (cf *Raman effect*) (2) A change of workers

shikimol Safrole

shikonin $C_{16}H_{16}O_5$ = 288 11 A principle from shikon, the dried root of *Lithospermum erythrorhizon*, a Boraginaceae of Japan

shilajatu A mineral gum from India

shipping The transporting of materials Many chemicals, especially those of low melting point, spoil in warm weather and must be kept cool, as, $CaCl_2$, menthol, salol, *p*-dichlorobenzene Others dry out and lose weight, as, crystalline Na_2CO_3, Na_2SO_4, and Na_3PO_4 **s container** A vessel for storing or shipping a solid, liquid, or gas The principal containers are made of

GLASS—sealed tubes, vials, ampoules, bottles, carboys

METAL—lead-tubes, tins, metal cans, canisters, drums, barrels, steel cylinders, tank cars, lead carboys

WOOD—boxes, kegs, barrels

PAPER—paper bags, cartons, cardboard boxes, cardboard cylinders

CERAMICS—earthen jugs, stone jars

TEXTILES—burlap bags, burlap sacks

PARAFFIN—bottles

HARD RUBBER—bottles, cylinders

s rules The regulations governing the transport of dangerous chemicals See *hazard, labels*

shirlacrol A solution of phenolic tars and sodium hydroxide, used as a wetting agent in the textile industry

shirlan A mildew-preventive for textiles, 30 times as powerful as zinc chloride, but harmless to the cloth and to humans It was evolved at the Shirley Institute, q v

shirlastain A stain evolved by the Shirley Institute (q v) for distinguishing various textile fabrics *E g*, cotton, blue, jute, brown, ramie, lavender, acetate rayon, green, wool, yellow, silk, orange

Shirley Institute The headquarters of the British Cotton Industry Research Association, near Manchester

shock (1) A violent collision between bodies, or the concussion it occasions (2) The effect of an electric discharge on the animal body.

shoddy Wool waste

shogaol $C_{17}H_{24}O_3$ = 276 19 4-Hydroxy-3-methoxy-phenylethyl-heptenyl ketone The pungent principle of ginger, resembling zingerone in having OH, OMe and CO groups A colorless liquid, d 1 04, b $_{15mm}$235, soluble in water or alcohol

Shore hardness The height of rebound of a diamond-pointed hammer falling under gravity on an object It is measured on an empirical scale, with a high-carbon steel taken as 100

short circuit An electric current which passes directly between leads or wires which touch at a point between the source of current and its destination

shorthand See *structure symbols*

shortite $Na_2CO_3\,2CaCO_3$ A pyroelectric crystalline mineral from Wyoming

shotgun pattern The irregular points on a diagram which, instead of coinciding with a theoretical curve, are unevenly distributed

shoyu The aromatic principle of fermented koji It contains phenolic compounds, and is used as flavoring agent

shunt An alterable resistance connected in parallel with a galvanometer or other circuit, and used to control the current passing through it by diverting or "shunting"

Si The symbol for silicon

sial [Contraction of Si and Al] A hypothetical solid or semi-solid rock substance on which the land masses of the earth are assumed to be supported Cf *sima*

sialagogue An agent that increases the flow of saliva

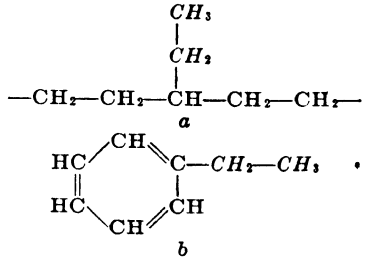
siaresinolic acid $C_{30}H_{46}O_4$ = 470 4 A resin acid, $C_3H_7\,C_{26}H_{39}O_2\,COOH$, from Siamese benzoin gum, m 260, soluble in alcohol

sibucao Sappan wood

sibucara The bark of an unknown tree of Venezuela

siccative Drier A solution of lead-manganese or zinc salts of resin acids It is added to varnish or paints to quicken their drying

side-chain A group of two or more similar atoms, generally carbon atoms, that branch off from a ring of atoms or a longer chain of atoms

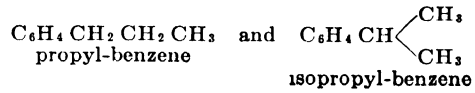


a

b

For type *a* the term, "branched chain," is preferable, restricting "side-chain" to type, *b* Cf *chain, Ehrlich's theory, protoplasm*

s isomery The isomery of a set of molecules that differ in structure by reason of a different arrangement of the atoms in the sidechain, as,



propyl-benzene and isopropyl-benzene

s substitution A reaction in which substitution takes place in the side-chain of the molecule

s theory See *Ehrlich's theory*

side-cut A distillate obtained by fractional distillation

side reaction Simultaneous but subsidiary reaction

siderazote Fe_5N_2 A volcanic incrustation

sidereal Pertaining to the fixed stars Cf *solar, lunar*

s day (86164 1 seconds) q v

s year (365 d , 6 hrs 9 min 9 sec) q v

siderite (1) $FeCO_3$ Clay iron stone, chalybite, spathic iron ore, a native iron carbonate (2) An iron meteorite A body of metallic iron with Ni, Co, etc , which has fallen to earth from outer space

siderocyte A blood cell containing iron

siderography (1) The study of the natural surface condition of siderites (2) The etching of steel and iron, and its microscopic study

siderolite Mesoderite A meteorite consisting of spongy meteoric iron, with embedded grains of silicate minerals, such as chrysolite

siderology Siderurgy

sideroplesite A form of bruennerite

siderosis Damage to lungs due to exposure to dusts containing iron or steel

siderostat An instrument to transmit a beam of light along the optical axis of a fixed horizontal telescope

siderotilate $FeSO_4\,5H_2O$ A native ferrous sulfate

siderurgy Siderology A branch of science that deals with the metallurgy of iron

sidonal Piperazine quinate

Sidgwick, Nevil Vincent 1873– An English physical chemist, noted for his electronic theory of valency

Sidot's blende An artificially-prepared zinc sulfide, which contains traces of copper, used in fluorescent screens for x-rays or radioactive rays

Siegbahn, Karl Manne Georg A Swedish physicist, noted for his work on crystal structure

S notation See *quantum numbers*

Siemens, Carl Friedrich von 1872– A German industrialist

S, Karl Wilhelm 1823–1883 A German chemist, and inventor of the S process, q v

S furnace A reverbatory furnace, heated by gas

S-Halske process A method for recovering copper by dissolving copper sulfides in a solution of ferrous sulfate and sulfuric acid, and obtaining the metallic copper by electrolysis

S-Martin process A method for producing steel in a reverbatory furnace by adding scrap iron to iron ores

S ozonizer Two concentric glass tubes, the outer covered and the inner lined with tin foil, which act as electrodes for a silent discharge passed through the stream of oxygen flowing between them

S process A method for making wrought iron directly from iron ores

S producer A furnace used in the manufacture of producer gas

sienna A brownish-yellow clay used as a permanent pigment It contains hydrated ferric oxide and manganic oxide

burnt s A burnt form of sienna, which is richer and brighter in color than s

sieve An apparatus with square apertures, used to separate particles according to size Cf *screen* (round holes)

sigma A letter of the Greek alphabet σ

The one-thousandth part of a second

S reaction Σ test The Wassermann test for syphilis

Sikes' hydrometer See *hydrometer*

sikimin $C_{10}H_{16}$ = 136 1 A terpene in the leaves of *Illicium religiosum*, the sikimi plant of Japan, a Magnoliaceae Cf *staranise*

silage A fodder made of finely-cut green plants packed tightly in tanks (silos) and fermented

silanes Silicans, q v , silicohydrides, hydrosilicons A group of compounds similar to hydrocarbons in which tetravalent silicon replaces the carbon atom, as,

SiH_4—monosilane, silicomethane
Si_2H_6—disilane, silicoethane
Si_3H_8—trisilane, silicopropane
Si_4H_{10}—tetrasilane, silicobutane

Silanes are very reactive, ignite in air, and form derivatives, as, $SiHCl_3$, trichlorosilane or silicochloroform

silanol Silicol

silbamin Silver fluoride

Silesia explosive A high explosive consisting of 75 % $KClO_3$ and 25 % nitrated resin

silex A heat-and-shock-resistant glass containing 98 % quartz

liquid- Waterglass

silfos An alloy, m 625–705, of 80 % Cu, 15 % Ag and 3 % P, used for brazing alloys containing copper

silica SiO_2 = 60 1 Silicon dioxide, silicic acid anhydride It occurs abundantly in nature (12 % of all rocks), and exists in 7 crystalline forms

Stable		Transition °C
		573°
below 870°C	quartz	$\alpha \rightleftharpoons \beta$
		117° 163°
below 1470°C	tridymite	$\alpha \rightleftharpoons \beta_1 \rightleftharpoons \beta_2$
		200–273°
above 1470°C	cristobalite	$\alpha \rightleftharpoons \beta$
	1200°	

also quartz ⟶ cristobalite

The many silica minerals may be grouped into (1) Phenocrystalline or vitreous minerals (see *quartz*) (2) Cryptocrystalline and amorphous minerals (see *chalcedony*) (3) Amorphous and colloidal minerals (see *opal*) **amorphous-** A colorless powder, d 2 30, m 1650, insoluble in water or alcohol, soluble in hot alkalis or hydrofluoric acid, used for chemical glassware **colloidal-** See *silicic acid* **crystalline-** Colorless hexagonal, transparent prisms, d $_{16}$°2 660 m - 1760, insoluble in water, alcohol, alkalis or acids, soluble in hydrofluoric acid Used in optical instruments, and for chemical glassware as a platinum substitute The main crystalline forms (quartz, tridymite and cristobalite) have definite transition points, (870°C and 1470°C, respectively)

s brick A fire-brick containing over 92 % s, its crystalline phase is cristobalite and tridymite **s gel** A gelatinous form of silica which, if activated, absorbs water, used to dry blast-furnace gases, air, and other gases **s minerals** A group of rock-forming minerals

quartz, tridymite	SiO_2
Feldspar group	
orthoclase	$KAlSi_3O_8$
albite	$NaAlSi_3O_8$—Ab
anorthite	$CaAl_2Si_2O_8$—An

The composition of other rocks is indicated by the proportion of Ab and An, as,

oligoclase	Ab_6An_1 to Ab_3An_1
andesine	Ab_3An_1 to Ab_1An_1
labradorite	Ab_1An_1 to Ab_1An_3
bytownite	Ab_1An_3 to Ab_1An_6
Leucite group	
leucite	$KAlSi_2O_6$
analcite	$NaAlSi_2O_6$
Nephelite group	
nephelite	$NaAlSiO_4$
kaliophylite	$KAlSiO_4$
eucryptite	$LiAlSiO_4$
Cancrinite-sodalite group	
cancrinite	$Al_3Na_4HCSi_3O_{15}$
sodalite	$Al_3Na_4ClSi_3O_{12}$
hauynite	$Al_3Na_4CaSSi_3O_{16}$
noselite	$Al_3Na_5SSi_3O_{16}$
Pyroxene group	
enstatite	$MgSiO_3$
hypersthene	$FeSiO_3$
wollastonite	$CaSiO_3$
diopside	$CaMgSi_2O_6$
hedenbergite	$CaFeSi_2O_6$
acmite	$NaFeSi_2O_6$
jadeite	$NaAlSi_2O_6$
spodumene	$(Li, Na)_2 AlSi_2O_6$
Amphibole group	
anthophyllite	$(Mg, Fe)SiO_3$
tremolite	$CaMg_3Si_4O_{12}$
glaucophane	$NaAlSi_2O_6 FeSiO_3$
Olivine group	
forsterite	Mg_2SiO_4
fayalite	Fe_2SiO_4
monticellite	$MgCaSiO_4$
glaucochroite	$CaMnSiO_4$
Mica group	
muscovite	$Al_3KH_2Si_3O_{12}$
paragonite	$Al_3NaH_2Si_3O_{12}$
lepidolite	$AlR_2F_2Si_3O_8$(Li K)
biotite	$Al_2Mg_2KHSi_3O_{12}$
phlogopite	$AlMg_3KH_2Si_3O_{12}$
chloritoid	$Al_2FeH_2SiO_7$
Chlorite group	

A number of minerals of the type, $Al_2(MgOH)_4(SiO_4)_3$ and $Al(MgOH)_6H_2(SiO_4)_3$

Melilite group	
melilite	$(Al,Fe)_2(Ca,Mg)_3Si_2O_{10}$
gehlenite	$Al_2Ca_3Si_2O_{10}$
akermanite	$Ca_4Si_3O_{10}$
sarcolite	$Al_2(Na_2Ca)_3Si_3O_{12}$
Garnet group	
grossularite	$Ca_3Al_2Si_3O_{12}$
pyrope	$Mg_3Al_2Si_3O_{12}$
almandite	$Fe_3Al_2Si_3O_{12}$
spessartite	$Mn_3Al_2Si_3O_{12}$
garnet	$Ca_3Fe_2Si_3O_{12}$
uvarovite	$Ca_3Cr_2Si_3O_{12}$
lagoriolite	$Na_6Al_2Si_3O_{12}$
Scapolite group	
melonite	$Ca_4Al_6Si_6O_{25}$
marialite	$Na_4Al_3Si_9O_{24}Cl$
Iolite group	
iolite	$H_2(Fe\ Mg)_4Al_8Si_{10}O_{36}$
Zoisite group	
zoisite	$HCa_2Al_3Si_3O_{13}$
epidote	$HCa_2(Al,Fe)_3Si_3O_{13}$
piedmontite	$HCa_2(Al,Mn)_3Si_3O_{13}$
Topaz group	
topaz	$Al_2SiO_4F_2$
Andalusite group	
andalusite	$Al\ SiO_5$
sillimanite	Al_2SiO_5
kyanite	Al_2SiO_5
Tourmaline group	

A group of borosilicates of aluminum and other bases of the average type, $Al\ M_8Si_6B_3O_{31}$ M is lithium or sodium, and sometimes potassium, in the alkali-tourmalines, magnesium, in the magnesium tourmalines iron, in iron tourmalines

Zeolite group	
heulandite	$CaAl_2Si_6O_{16}\ 5H_2O$
stilbite	$(Na_2,Ca)Al_2Si_6O_6\ 6H_2O$
laumontite	$CaAl_2Si_4O_{12}\ 4H_2O$
chabazite	$CaAl_2Si_4O_{12}6H_2O$
Miscellaneous group	
beryl	$Al_2Be_3Si_6O_{12}$
serpentine	$H_4Mg_3Si_2O_9$
talc	$H_2Mg_3Si_4O_{12}$

silicam $Si_2N_3H_2$ = 100 2 A white powder obtained by heating silicon imide, $Si(NH)_2$ Insoluble in water, and forms silicon nitride, Si_2N_4, when further heated

silicane (1) A silane, that is, a compound of the type Si_xH_y (2) An organic compound of the type SiR_4, where R is a hydrocarbon radical (3) SiH_4 = 32 08 Monosilane, silicomethane, silicohydride A colorless gas, m - -185, b -112 **bromo-** SiH_3Br = 111 0 A colorless gas, d $_{-80°}$ 1 72, m 94, b 1 8 **chloro-** SiH_3Cl = 66 54 A colorless gas, d$_{-113°}$ 1 145, m -118, b -30 4 **di-** Si_2H_6 = 62 16 Silicoethane, a gas, m -132 **dibromo-** SiH_2Br_2 = 189 91 A colorless liquid, d 2 17, m -70 1, b 66 **dichloro-** SiH_2Cl_2 = 100 99 A colorless gas, d$_{-113°}$ 1 42, m -122, b 8 3 **dimethyl-** SiH_2Me_2 = 60 12 Dimethylmonosilane Colorless gas, d $_{-80°}$ 0 68, m -150, b -20 **ether-** $(SiH_3)_2O$ = 78 17 Disilaneoxide A colorless gas, d$_{-80°}$ 0 881, m -143 5, b 15 2 **ethoxytriethyl-** Et_3SiOEt = 160 22 Triethylsilane ethyloxide triethylsilicol ethylether Colorless liquid, d 0 8403, b 153, insoluble in water **hydroxy-** Silicol **methyl-** $MeSiH_3$ = 46 11 Methylmonosilane Colorless gas, d$_{-57°}$ 0 62,

m −156 5, b −56 8 **tetra-** Si_4H_{10} = 122 31 Silicobutane A gas, m −93 5 **tetrabromo-** Silicon bromide **tetrachloro-** Silicon chloride **tetraethyl-** $Si(C_2H_5)_4$ = 144 25 Silicon tetraethyl, siliconononane, $SiEt_4$ A colorless liquid, d 0 7682, b 153 **tetrafluoro-** Silicon fluoride **tetraiodo-** Silicon iodide **tetramethyl-** $SiCH_4$ = 144 22 Silicon tetramethyl, $SiMe_4$ Colorless liquid, d 0 645, b 27 **tetraphenyl-** $Si(C_6H_5)_4$ = 336 24 Silicon tetraphenyl, tetraphenylsilicon, $SiPh_4$ Colorless crystals, m 233 **tri-** Si_3H_8 = 92 24 Silicopropane A gas, m −117 **tribromo-** $SiHBr_3$ = 268 82 Silicobromoform A colorless liquid, d 2 7, m −80, b 109 **trichloro-** Silicochloroform **trichloroethyl-** $Si(C_2H_5)Cl_3$ = 163 47 A colorless liquid, d 1 239 **trichlorophenyl-** $Si(C_6H_5)Cl_3$ = 211 47 A colorless liquid, d 1 326, b 197, decomp in water **triethyl-** $(C_2H_5)_3SiH$ = 116 18 Triethylsilicon, silicoheptane, Si_7Et_3H Colorless liquid, d 0 751, b 107, insoluble in water **trifluoro-** $SiHF_3$ = 86 07 Silicofluoroform A colorless gas, m −110, b −80 2 **triiodo-** SiI_3H = 409 83 Silicoiodoform A red liquid, d 3 314, m 8, b 220

silicate A salt derived from silica or the silicic acids They form, by far, the largest group of minerals (see *silica*), and are derived from the two types M_4SiO_4—*ortho*silicate, M_2SiO_3—*meta*silicate, which may combine to form a number of *poly*silicates With the exception of the alkali silicates, they are insoluble in water (see *silica minerals*) **s cement** See *dental* cement **s of soda** Sodium silicate

siliceous Containing quartz or silica **s algae** See *algae* **s deposit** S sinter The solid accumulation of silica deposited from hot mineral springs or geysers Cf *geyserite, fluorite* **s sinter** S deposit

silicic (1) Containing silica or silicon (2) Containing silicic acid **s acid** H_4SiO_4 = 96 3 Ortho-silicic acid Colorless, amorphous powder, d 1 576, slightly soluble in water **di-** $H_2Si_2O_5$ or $H_6Si_2O_7$ A white insoluble powder **meta-** H_2SiO_3 = 78 1 A white powder, d 1 813, insoluble in water, soluble in alkalis **tri-** $H_4Si_3O_8$ = 216 3 A white insoluble powder

SILICIC ACIDS

%H_2O	%SiO_2	
↑	↑	$H_2Si_4O_9$ = $4SiO_2\ H_2O$, tetra-
		$H_2Si_2O_5$ = $2SiO_2\ H_2O$, meta-di-
		$H_4Si_3O_8$ = $3SiO_2\ 2H_2O$, meta-tri-
		H_2SiO_3 = $SiO_2\ H_2O$, meta-
		$H_8Si_3O_{10}$ = $3SiO_2\ 4H_2O$, ortho-tri-
		$H_6Si_2O_7$ = $2SiO_2\ 3H_2O$, ortho-di-
↓	↓	H_4SiO_4 = $SiO_2\ 2H_2O$, ortho-

silicide A binary compound of tetravalent silicon and a metal, as, M_2Si, where M is Fe, Ni, Co, Cr, Mn, Cu, or Mg

silicification The gradual replacement of rocks or fossils by silica (petrifaction)

silicified Describing an organic material (*e g*, wood) that has been converted into silica (petrified)

silicium Silicon

silico- A prefix indicating silicon, generally in organic compounds **s acetic acid** $MeSiOOH$ = 76 1 An insoluble solid **s benzoic acid** $PhSiOOH$ = 138 1 A solid, m 92 insoluble in water, soluble in alcohol or ether **s bromoform** $SiHBr_3$ = 268 9 A heavy, colorless liquid, d 2 7, b 116, decomp by water **s butane** See *silanes* **s calcium** A product of the electric furnace used to deoxidize steel **s chloroform** $SiHCl_3$ = 135 36 A colorless liquid, d 1 34, m −1 3, b 34, decomp by water **s decitungstic acid** $H_8SiW_{12}O_{36}$ or $SiO_2\ 10WO_3\ 4H_2O$ A white powder used as a reagent, as it forms insoluble cesium salts **s ethane** Disilane (see *silanes*) **s fluorides** Fluosilicate **s fluoric acid** Fluosilicic acid **s formic acid** See *leucone* **s heptane** Et_3SiH = 116 1 Triethylsilane A colorless liquid, d 0 751 b 107 **s hydrides** Silanes **s iodoform** $SiHI_3$ = 409 9 A colorless heavy liquid, d 3 4, b 220, decomp by water **s methane** Silane **s oxalic acid** $Si_2O_4H_2$ = 122 2 $HOOSi\ SiOOH$ A white unstable solid **s tungstic acid** S decitungstic acid

silicol Hydroxysilan A compound of the type R_3SiOH as, **triethyl-** Et_3SiOH = 132 18 Silicoheptyl alcohol A colorless liquid d 0 8709, b 154, insoluble in water

silicon Si = 28 06 Silicium A non-metallic element of the carbon group, atomic number 14 It occurs in several allotropic modifications (1) *amorphous* s A brown powder, d 2 35 (2) *crystalline* s A grayish-black crystalline powder, d 2 49, m 1500, insoluble in water, soluble in alkalis (3) *graphitoidal* s A dense crystalline form, or graphite-like masses deposited from molten silicon (4) *adamantine* s Needle-shaped crystals of silicon of extreme hardness The principal valency of s is four, and like carbon, it forms many complex compounds that are an essential part of the earth surface (rocks) See *silica minerals* **ethyl-** The radical $\equiv SiEt$, cf *silicane* **methyl-** The radical $\equiv SiMe$ **radio-** The isotope of mass 27 Cf *radioelements*

s alkyls (1) A group of hydrogen compounds of silicon corresponding with the hydrocarbons, as, SiH_4, Si_2H_6 etc See *silane* (2) An organic compound of Si and alkyl radicals, as, $SiMe_4$, $SiEt_4$ etc See *silicanes* **s alloys** A group of non-corrosive alloys of silicon with metals, as, duriron, ironac, nerki, silumin, and tantiron Cf *s copper, s steel, s zirconium* **s borides** The hard compounds SiB_3 and SiB_6 **s bronze** A noncorrosive alloy of silicon, copper, and tin **s bromides** (1) $SiBr_4$ = 347 9 S tetrabromide A colorless fuming liquid, d 2 813, m −12, b 154, decomp by water to silicic acid and hydrobromic acid (2) Si_2Br_6 = 535 7 S tribromide A colorless solid, b 240, decomp by water **s carbide** SiC = 40 1 Carborundum Silundum, crystolon Colorless rhombohedric plates, d 3 12, dissociates at 2250°C, but has no melting point, insoluble in water, alcohol, or ether Used as an abrasive **s chlorides** (1) $SiCl_4$ = 170 0 S tetrachloride A colorless fuming liquid, d 1 524, m −87, b 57 6, decomp by water to silicic and hydrochloric acid Used in electrotechnics, and mixed with ammonia vapors, in the production of smoke screens (2) Si_2Cl_6 = 269 0 S trichloride A white solid, d_0° 1 58, m −1, b 146, decomp by water (3) Si_3Cl_8 = 367 8 S octachloride A white powder **s copper** An alloy of 20–30 % Si and 70–80 % Cu, used in metallurgy **s dioxide** Silica **s disulfide** SiS_2 = 92 2 White needles, which sublime when heated, decomp by water **s ethane** See *silanes* **s ethyl** Tetra-

ethyl silicane (see *silicane*). **s. fluorides:** (1) SiF_4 = 104.3. S. tetrafluoride. A colorless, suffocating gas, $d._{(air=1)}3.57$, m. −77 (at 2 atm.), $b._{1810mm.}$ −65, decomp. by water to fluosilicic acid, soluble in alcohol or ether. (2) Si_2F_6 = 170.6. S. subfluoride. A white powder. **s. hydrides.** See *silanes*. **s. iodides:** (1) SiI_4 = 535.8. S. tetraiodide. A colorless solid, m.121, b.290; insoluble in water. (2) Si_2I_6 = 817.7. S. subiodide. A colorless solid, m.250 (in vacuo); decomp. by water. **s. iron.** Ferrosilicon. An iron that contains from 2 to 15 % silicon; used in metallurgy. **s. magnesium.** Mg_2Si = 76.7. Magnesium silicide. Gray leaflets of metallic luster, decomp. by water to silanes. **s. methane.** Silane. **s. methyl.** $SiMe_4$ = 88.3. A colorless liquid, b.26. **s. nitride.** Si_3N_4 = 140.2. A gray or white amorphous powder; insoluble in water. **s. octachloride.** See *s. chlorides*. **s. oxide.** Silica. **s. oxychlorides:** The liquids Si_2OCl_6 (b.137); $Si_4O_4Cl_8$ (b.200); $Si_4O_3Cl_{10}$ (b.153); $Si_3O_{10}Cl_{12}$ (b.300); $Si_2O_3Cl_2$ (b.400); and the solid $Si_4O_7Cl_2$ (m.400). **s. steel.** A steel that contains 2–3 % Si. It is hard, brittle, and difficult to work. **s. sulfide.** S. disulfide. **s. tetrabromide.** See *s. bromides*. **s. tetrachloride.** See *s. chlorides*. **s. tetrafluoride.** See *s. fluorides*. **s. tetraiodide.** See *s. iodides*. **s. tetraphenyl.** Tetraphenyl silicon. **s. tungstic acid.** Silico decitungstic acid. **s. zirconium.** An alloy used to purify molten steel.

silicone. $H_3Si_3O_2$ = 119.2. A yellow solid.

siliconic acid. A compound of the type R.SiOOH, analogous to organic acids. Cf. *carbylic acid*.

siliconize. To combine or mix with silicon or silica.

silicono. The monovalent radical, (HO)OSi—, derived from metasilicic acid.

silicotungstate. A salt of silicotungstic acid, especially with the alkaloids.

silicotungstic acid. $4H_2SiO_2.12WO_3.22H_2O$. $SiO_2.12WO_3.26H_2O$. Colorless or slightly yellow crystals, soluble in water or alcohol; used for the qualitative and quantitative analysis of alkaloids.

silicyl. (1) The monovalent radical H_3Si—, derived from silane. (2) The divalent radical, =SiO, derived from silicic acid. **di-** The divalent radical $=Si_2O_5$. **s. oxide.** A compound of the type $(R_3Si)_2O$; as, *hexaethyl-* $(Et_3Si)_2O$ = 246.35. A colorless liquid, d.0.859, b.231.

silicylene. The divalent radical, $H_2Si=$, from silane.

silk. (1) Fibroin, sericin. The fibrous material with which the silkworm envelops itself before passing into the chrysalis state (cocoon). It consists of fibroin (the fiber protein) and sericin (the gummy protein). The former yields on hydrolysis:

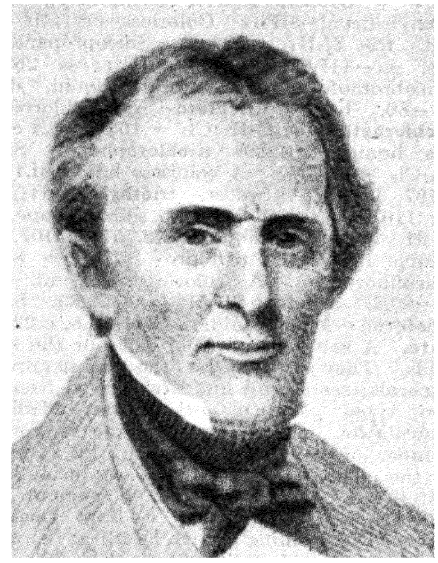
alanine	23.8 %
glycine	19.7 %
tyrosine	9.8 %
aspartic acid	2.9 %
proline	1.9 %
glutamic acid	1.7 %
leucine	1.6 %
phenylalanine	1.2 %
serine	1.0 %

(2) A sieve used for grading flour. No. 5 s. = 0.270, No. 8 s. = 0.190 mm. aperture. **artificial-** Rayon. **vegetable-** (1) The floss from the seeds of *Calotropis gigantea*, an Asclepiadaceae of Asia. (2) Kapok.

silkwarp. Organzine.

silkweed. Milkweed. The dried roots of *Asclepias syriaca*. Used medicinally, as the fluid extract, as a diuretic and tonic.

silky. Having the luster of silk.



Benjamin Silliman (The Elder).

Silliman, Benjamin. (1) 1779–1864. An American chemist and geologist, who founded the American Journal of Science and Arts. (2) 1816–1885. His son. An American inorganic chemist noted for his textbooks.

sillimanite. Al_2SiO_5. (1) A rhombic aluminum silicate, used for porcelain of superior quality, m.1820. Above 1545°C. it forms mullite and siliceous glass. See *cyanite*. (2) Fibrolite. **s. ware.** Laboratory utensils (dishes, crucibles, tubes, etc.) made of s. which have remarkable strength against mechanical and thermal shock.

Sillman bronze. An alloy of 86 % copper, 10 % aluminum and 4 % iron.

silo. (1) A tank or channel for conveying solid material in small pieces (such as coal), on the large scale. (2) A pit or chamber in which fodder is fermented. See *silage*.

siloxicon. Si_2OC_2. A refractory material obtained by heating quartz, carbon and sawdust in the electric oven. Cf. *fibrox*.

silumin. A non-corrosive alloy of silicon and aluminum, sometimes containing 4–5 % copper.

silundum. Silicon carbide.

silvan. Sylvan.

silver. Ag = 107.880. A metal of the gold family and element, atomic number 47. A white lustrous metal of regular crystalline structure, d.10.5, m.961, b.2570, soluble in nitric acid or hot conc. sulfuric acid, insoluble in hydrochloric acid, water, or cold sulfuric acid. Silver forms only one series of compounds and has a valency of one. It is used as metal in jewelry, coins and instruments; and in the manufacture of silver salts for photography and pharmacy. The World output in 1941 was

275,000,000 ounces troy, coming from Mexico (about half) > U S A > Canada > Peru > Australia > Japan **antimonial-** Dyscrasite **black-** Stephanite **blue-** Niello **coinage-** See *s alloys* **colloidal-** Collargol **fulminating-** S nitride **German-** q v **horn-** Argentum cornu **liquid-** Mercury **moss-** A native s in moss-like form **niello-** q v **nickel-** German s **quick-** Mercury **ruby-** Proustite **Russian-** Mello

s acetate $AgC_2H_3O_2$ = 166 9 Colorless crystals, d 3 259, decomp by heat, soluble in water, or alcohol, used medicinally in ophthalmia **s acetylide** Ag_2C_2 = 239 88 s carbide An explosive white powder **s alloys** A mixture of silver with some other metal, principally

coinage silver
U S —Ag 90, Cu 10 %
British—Ag 50, Cu 40, Ni 5, Zn 5 %
jewelry silver
ordinary—Ag 80, Cu 20 %
hall-marked—Ag 92 5, other metals usually Cu and/or Cd 7 5 %

The melting points of silver alloys are

with	90 % Ag 10 %	80 % Ag 20 %	70 % Ag 30 %	60 % Ag 40 %	50 % Ag 50 %
Al	750°C	650°C	570°C	575°C	580°C
Au	982°C	1006°C	1025°C	1039°C	1040°C
Cd	940°C	895°C	850°C	805°C	760°C
Cu	875°C	814°C	788°C	830°C	870°C
Pb	905°C	840°C	775°C	705°C	650°C
Sb	850°C	680°C	545°C	505°C	500°C
Sn	870°C	750°C	630°C	550°C	495°C
Zn	850°C	755°C	705°C	690°C	660°C

s amalgam $AgHg_2$ = 509 1 A silvery, uneven, brittle solid **s ammonium chloride** $AgCl\ NH_4Cl$ = 196 9 Colorless cubes, soluble in ammonium hydroxide, used medicinally **s ammonium nitrate solution** A test solution made by dissolving one gram of silver nitrate in 20 cc of water and adding ammonia until the precipitate has just dissolved It is then filtered, kept in amber bottles, and used for silvering, or the production of a silver mirror on heating with certain organic reducing agents **s antimonide** S stibide **s arsenate** Ag_3AsO_4 = 462 6 A dark-red powder, d 6 66, insoluble in water and soluble in alcohol or alkalis **s arsenide** Ag_3As = 398 4 A velvet-black precipitate, readily decomp when dried **s arsenite** Ag_3AsO_3 = 446 60 A yellow powder, insoluble in water, used medicinally as an antiseptic in skin diseases **s arsphenamine** A compound of silver and salvarsan, used medicinally **s atoxylate** $NH_2C_6H_4AsO\ AgO\ OH$ = 323 8 Argatoxyl, silver-p-aminophenylarsenate, used medicinally as a bactericide **s azide** AgN_3 = 149 91 A curdy, white explosive powder (cf *s nitride*) **s benzamide** See *benzamide* **s benzoate** $AgC_7H_5O_2$ = 228 8 A colorless powder, soluble in hot water, slightly soluble in alcohol **s bichromate** S dichromate **s borate** $Ag_2B_4O_7$ = 371 0 An unstable white powder, soluble in ammonium hydroxide or cyanide solutions **s bromate** $AgBrO_3$ = 235 8 Colorless tetragonal crystals, d 5 206, decomp by heat, soluble in hot water, slightly soluble in alcohol **s bromide** AgBr = 187 80 Native as bromyrite and embolite A yellow powder or pale yellow regular crystals, d 6 473, m 427, decomp 700, insoluble in water, alcohol or ether, soluble in cyanide, bromide, or thiosulfate solution Used in photography as a light-sensitive coating on plates, films, and papers **s carbide** S acetylide **s carbonate** Ag_2CO_3 = 275 8 A heavy yellow powder, d 6 0, decomp 200, insoluble in water, soluble in cyanide or hydroxylamine solutions **s caseinate** Argonin **s chlorate** $AgClO_3$ = 191 3 Colorless, regular or tetragonal crystals d 4 21, m 230, decomp 270, soluble in water or alcohol, insoluble in ether **s chloride** AgCl = 143 34 Lunar cornea Native as horn-silver, cerargyrite, embolite Colorless regular crystals or white powder, d 5 553, m 455, insoluble in water or alcohol, soluble in ammonium hydroxide, cyanide or thiosulfate solutions Used as an antiseptic and nerve sedative, in the manufacture of pure silver, and silver salts, for silver plating, and in photography and photometry **s chlorite** $AgClO_2$ = 175 3 A yellow powder, slightly soluble in water **s chromate** Ag_2CrO_4 = 331 8 Dark-red crystals, d 5 623, insoluble in water, soluble in ammonium hydroxide **s cinnamate** $AgC_9H_7O_2$ = 254 8 Silver cinnamylate A heavy white powder, slightly soluble in water or alcohol, used medicinally as an antiseptic **s cinnamylate** S cinnamate **s citrate** $Ag_3C_6H_5O_7$ = 512 4 Itrol An odorless, heavy, white powder, insoluble in water or alcohol, used medicinally as a non-irritant dusting-powder for wounds **s colloidal** Collargol, argentum colloidale An allotropic form of metallic silver, with a small percentage of albumin, black scales giving a fairly stable colloidal suspension with water **s cyanate** AgCNO = 149 9 A colorless powder, d 4 0, decomp by heat, slightly soluble in water, soluble in ether or nitric acid **s cyanide** AgCN = 133 90 A white crystalline powder, d 3 99, decomp by heat, insoluble in water or alcohol, soluble in cyanide, thiosulfate or ammonium salt solutions Used medicinally as an antipyretic and sedative **s dichromate** $Ag_2Cr_2O_7$ = 431 76 Purple, triclinic crystals d 4 67, decomp by heat or alcohol, slightly soluble in water **s dithionate** $Ag_2S_2O_6$ = 375 90 **s eosolate** The silver salt of trisulfoacetylguaiacol, $C_6H_5O—CH_2O—C_2H_3O\ Ag_2(SO_3)_3$, used medicinally as an antiseptic **s ferricyanide** $Ag_3Fe(CN)_6$ = 535 5 An orange-red crystalline powder, slightly soluble in water, soluble in ammonium hydroxide **s ferrocyanide** $Ag_4Fe(CN)_6\ H_2O$ = 661 4 A yellow crystalline powder, insoluble in water or alcohol, soluble in cyanide solutions **s fluoride** AgF,H_2O = 144 90 Tachiol Silbamin Yellow or colorless, tetragonal, deliquescent crystals, soluble in water, d 5 852, m 435, used medicinally as a strong antiseptic, and to sterilize water **s fluosilicate** (1) Ag_2SiF_6 = 249 94 A white powder (2) $Ag_2SiF_6\ 4H_2O$ = 366 94 Globular granules, slightly soluble in water **s fulminate** $Ag_2C_2N_2O_2$ = 299 8 Colorless, small needles which explode when

heated, slightly soluble in water, alcohol or ether Used in the manufacture of detonators **s gelatose** Albargin **s glance** S glanz Argentite **s hypochlorite** $AgClO$ = 159 34 An unstable bleaching agent **s hyponitrite** $Ag_2N_2O_2$ = 275 78 A yellow powder **s hypophosphate** See *s phosphates* **s iodate** $AgIO_3$ = 282 80 Colorless monoclinic crystals, d 5 4, decomp by heat, insoluble in water, slightly soluble in alcohol or ether Used medicinally as an astringent and antiseptic **s iodide** AgI = 234 8 Native as iodyrite A yellow hexagonal crystalline powder, d 5 674 m 536, insoluble in water, soluble in cyanide, iodide or thiosulfate solutions, used in photography, and medicinally as an alterative **s lactate** $AgC_3H_5O_3 H_2O$ = 214 8 Actol Colorless crystalline needles or granular masses, soluble in water, used medicinally as an antiseptic and astringent **s laurate** $AgC_{12}H_{23}O_2$ = 307 06 Colorless powder, m 212 5 **s leaf** Stillingia **s luster** The appearance of an untarnished metallic s surface **s methylene blue** A compound of silver and methylene blue A blue powder, soluble in water, used medicinally as a germicide and internal antiseptic **s myristate** $AgC_{14}H_{27}O_2$ = 335 09 White powder, m 211, insoluble in water **s nitrate** $AgNO_3$ = 169 9 Colorless hexagonal or rhombic crystals, d 4 352, m 209, decomp by further heat, soluble in water, alcohol, or ether Used as a reagent for detecting and determining halogens, aldehydes, chromic acid, arsenous oxide, hydrogen-peroxide, and many other compounds, also used medicinally as an antiseptic, in the manufacture of silver salts, for silver plating, in photography, for permanent laundry-proof markings, and for dyeing hair and fur *fused-* Lunar caustic, molded silver nitrate White hard sticks, used as an external antiseptic **s nitrate paper** A filter paper impregnated with a solution of silver nitrate and dried in the dark Used as a sensitive test paper for arsenic (yellow color), phosphorus (black color), chromates (red color) and uric acid (brown color) **s nitride** Ag_3N = 337 4 Fulminating s A gray, explosive substance insoluble in water, soluble in ammonium hydroxide Cf *s azide* **s nitrite** $AgNO_2$ = 153 9 A colorless crystalline powder, d 4 453, decomp 150, slightly soluble in water, ammonia or alcohol Used as a reagent in standardizing permanganate solutions, in determining nitrites and differentiating primary, secondary, and tertiary alcohols **s nucleinate** Nargol A compound of nucleic acids and silver A light powder, used medicinally **s ores** Silver is found in nature associated with copper and gold minerals and occurs generally in binary compounds, as

native silver	Ag
argentite, acantite	Ag_2S
chilenite	Ag_6Bi
animikite	Ag_9Sb
dyscrasite	Ag_3Sb
huntilite	Ag_3As
naumannite	Ag_2Se
aguilarite	Ag_4SSe
hessite	Ag_2Te
smithite	$AgAsS_2$
proustite	Ag_3AsS_3
miargyrite	$AgSbS_2$
matildite	$AgBiS_2$
cucairite	AgCuSe
stromeyerite	AgCuS
sternbergite	$AgFe_2S_3$
cerargyrite	AgCl
bromyrite	AgBr
iodyrite	AgI
argentiferous lead	AgPbS

See also *embolite, hornsilver, polyargyrite* **s oxalate** $Ag_2C_2O_4$ = 303 8 A white crystalline powder, d 5 029, detonating when heated, insoluble in water, soluble in nitric acid or ammonium hydroxide **s oxide** Ag_2O = 231 8 A heavy, brownish-black powder, d - 7 521, decomp 330, insoluble in water and soluble in nitric acid, used medicinally as an antiseptic and tonic **s oxyquinoline sulfonate** Argentol **s palmitate** $AgC_{16}H_{31}O_2$ = 363 12 A white powder, m 209, insoluble in water **s perchlorate** $AgClO_4$ = 207 3 A white crystalline powder, m 486, soluble in water or alcohol **s period** A group of heavy metals of the fourth sub-period in the periodic system, Ru, Rh, Pd, Ag, Cd, and In **s permanganate** $AgMnO_4$ = 225 8 Dark violet monoclinic crystals, decomp by heat slightly soluble in water or alcohol, used as an antiseptic **s peroxides** (1) Ag_2O_2 = 247 76 A black insoluble solid, d 7 44, decomp 110 (2) Ag_2O_4 = 279 76 An unstable solid **s phenolsulfonate** $C_6H_4(OH)SO_3Ag$ = 280 9 S sulfophenylate, s sulfocarbolate A colorless crystalline powder, soluble in water, used in ophthalmology and as a surgical antiseptic **s phosphates** (1) Ag_3PO_4 = 418 7 S orthophosphate A yellow powder, d 7 32, m 849, insoluble in water, soluble in ammonium hydroxide, used in photography (2) $Ag_4P_2O_7$ = 605 60 S pyro-phosphate A white insoluble solid, $d_{7.5°}$ 5 31, m 585 (3) Ag_2PO_3 = 294 76 **s hypophosphate** S **phosphide** AgP_2 = 169 88 A dark-colored powder **s picrate** $C_6H_2O(NO_2)_3Ag H_2O$ = 353 9 Picratol, s trinitrophenylate Yellow crystals, soluble in water, used medicinally as an antiseptic **s plate** Any metal utensil, vessel or ware plated or covered with metallic silver (See *Sheffield plate*, cf *electroplate*) **s plating** The process of electrolytically depositing a film of s on some other metal **s potassium cyanide** $KAg(CN)_2$ = 199 0 Potassium argentocyanide A colorless octahedral crystalline powder soluble in water or alcohol, used medicinally as a strong bactericidal antiseptic, and in silvering and silver plating **s quinaseptol** Argentol **s salicylate** $C_6H_4(OH)COOAg$ = 244 9 White or reddish crystals, soluble in water or alcohol used as an antiseptic **s salt** Sodium anthraquinone-β-sulfonate, used as an aid in stripping dyed rags by reducing agents **s selenide** Ag_2Se = 187 0 A dark gray powder, insoluble in water **s silicofluoride** Ag_2SiF_6 = 357 9 Isotachiol A colorless powder slightly soluble in water, used for sterilizing drinking water **s silvinate** S sylvate **s sodium chloride** $NaAgCl_2$ = 201 8 Colorless crystals, decomp by water **s sodium cyanide** Sodium argentocyanide **s sodium thiosulfate** $Na_4Ag_2(S_2O_3)_3$ = 643 6 White crystals, soluble in water, used technically **s solder** An alloy of 40, 50 or 60 % Ag with Cu, Zn and Cd (British Standard Specification) **s stearate** $AgC_{18}H_{35}O_2$ = 391 15 A white powder, m 205, soluble in

water s stibide Ag_3Sb = 443 6 S antimonide Rhombic black crystals, insoluble in water or dilute acids, soluble in boiling nitric acid **s sulfate** Ag_2SO_4 = 311 82 Colorless triclinic or rhombic crystals, d 5 40, m 651, decomp 925, slightly soluble in water, soluble in alcohol or nitric acid, used as a reagent and in electroplating **s sulfides** (1) Ag_2S = 247 83 Native as argentite and acanthite Gray or black regular crystals or powder, d 7 08, m 676, insoluble in water, soluble in concentrated nitric acid Used in the manufacture of pigments for ceramics (2) Ag_2S_2 = 279 88 A black solid **s sulfite** Ag_2SO_3 = 295 8 Colorless crystals decomp 100, slightly soluble in water or alcohol **s sulfocarbolate** S phenolsulfonate **s sulfocyanide** S ' thiocyanate **s sulfoichthyolate** Ichthargan **s sulfophenylate** S phenolsulfonate **s sylvate** $AgC_{20}H_{29}O_2$ = 408 8 S silvinate A brown crystalline powder, insoluble in water or alcohol **s tartrate** $Ag_2C_4H_4O_6$ = 363 6 A white crystalline powder, d 3 432, slightly soluble in water **s telluride** Ag_2Te = 343 1 Native as hessite A black powder insoluble in water **s thiocyanate** AgCNS = 166 0 A white powder, insoluble in water soluble in cyanide or ammonia solutions decomp by heat **s thiosulfate** $Ag_2S_2O_3$ = 327 90 A white solid, soluble in water decomp by heat **s tree** Arbor Dianae **s trinitrophenolate** S picrate **s vanadate** Ag_3VO_4 and $Ag_4V_2O_7$ A solid m 385, used as catalyst **s vitellin** Argyrol

silvering Coating or covering with metallic silver either produced chemically (*e g*, by reduction of silver salts) or deposited electrolytically

silverweed Wild tansy The herb of *Potentilla anserina* a Rosaceae used as an astringent and tonic

silvestrene $C_{10}H_{16}$ = 136 1 Sylvestrene A terpene from European turpentine A colorless liquid d 0 863, b 177

silvinate Sylvate

sima A liquid or semi-liquid rock substance on which the less dense sial (q v) floats The word is a contraction of *silica* and *magnesium magma*

simaruba Bitter damson The dried root bark of *Simaruba amara* or *S officinalis*, a Simarubaceae of tropical America It contains quassin and is used medicinally as an astringent

Simarubaceae A group of tropical shrubs and trees

Brucea sumatrana	kosam seeds
Picrasma excelsa	Jamaica quassia
Quassia amara	Surinam quassia
Simaruba officinalis	simaruba bark
Simaruba cedron	cedron seeds
Ailanthus glandulosa	Chinese sumac
Picramnaea antidroma	cascara amargosa
Castela Nicholsoni	amargosa bark

Cf *picramnine, picrasmine*

simmer To boil gently

Simon's test A test for primary and secondary amines Acetaldehyde and sodium nitroprusside added together, give a red and blue color, respectively

simple Not complex (as s spectrum) not mixed (as s ether), not double (as, s salt)

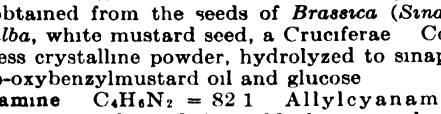
simultaneous reaction (1) A side-reaction or secondary reaction (2) A reaction which occurs at the same time and in the same reacting system as the principal reaction, or one of two reactions which occur at the same time and in the same reacting system See *reaction*

sinactine $C_{20}H_{21}NO_4$ = 339 0 *l*-Tetrahydro-*epi*-berberine A diisoquinoline alkaloid from *Sinomenium acutum*

sinalbin $C_{30}H_{44}O_{16}N_2S_2$ = 722 27 A glucoside obtained from the seeds of *Brassica* (*Sinapis*) *alba*, white mustard seed, a Cruciferae Colorless crystalline powder, hydrolyzed to sinapine, p-oxybenzylmustard oil and glucose

sinamine $C_4H_6N_2$ = 82 1 Allylcyanamide An amine derived from black mustard seed **thio-** Allylsulfocarbimide

sinapic acid $C_{11}H_{12}O_5$ = 224 1 An unsaturated oxyacid derived from sinapine



sinapine $C_{16}H_{23}O_5N$ = 327 3 An alkaloid derived from sinalbin the glucoside of white mustard It is hydrolysed to sinapic acid and choline

sinapis alba White *mustard* **s nigra** Black *mustard*

sinapolin $C_{21}H_{24}O_4N_2$ = 382 3 Diallylurea, $C_{14}H_{12}O_2N_2$ $C_7H_{11}O_2N$ A compound isolated from mustard oil

sine The ratio of the length of the side opposite an angle of a right-angled triangle to that of the hypotenuse gives the sine of the angle Cf *cosine*

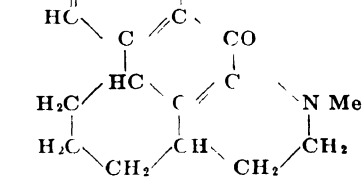
singular solution A solution that has a maximum or minimum point on its vapor-pressure curve

sinigrin Potassium myronate

sinistrin $C_6H_{10}O$ = 162 1 A levorotatory carbohydrate from squill

sinkaline Choline

sinomenine $C_{19}H_{23}O_4N$ = 329 3 An isoquinoline alkaloid from the roots and stems of *Sinomenium acutum* a Menispermaceae Colorless needles, m 182, soluble in benzene or alkalis



sinter (1) The incrustations formed around mineral springs by salt deposits (2) To vitrify by heating, as in sintering **calcareous-** Tufa, travertine or onyx **iron-** An amorphous form of scorodite **pearl-** A modification of silica **siliceous-** Geyserite (3) Fluorite

sintering The coalescence of crystalline or amorphous particles into one solid mass through heating, due to the formation of allotropic crystals Cf *fritted*

siomine $(CH_2)_6N_4I_4$ = 633 6 Hexamethylenetetramine tetraiodide A colorless powder, insoluble in water or alcohol, used medicinally

sipalin A mixture of the cyclohexyl and methylcyclohexyl esters of adipic acid, used as plasticizers in nitrocellulose lacquers

siphon A ∩ shaped pipe or tube with one leg longer than the other The short leg takes up

liquid and delivers it, by atmospheric pressure, into a receptacle on a lower level

sipylite A native columbate of erbium and other rare earth metals

sirup Syrup

sisal Sisal hemp A fiber from the leaves of *Agave sisalana*, a century plant of Mexico and the West Indies, used in making rope, twine and sacking Cf *henequen*

sitostane $C_{27}H_{46}$ = 370 4 An isomer of cholane q v

sitosterol $C_{27}H_{45}OH$ = 386 4 An alcohol from wheat, corn, bran and calabar beans, an isomer of cholesterol Cf *cholane* β- $C_{29}H_{48}O$ = 412 4 *22*-Dihydrostigmasterol **dihydro-** $C_{27}H_{48}O\ H_2O$ = 406 37 An alcohol, m 140–141, from corn, wheat etc A colorless mass, m 140, insoluble in water

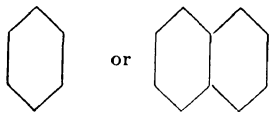
six hundred six (606) Salvarsan

sizing The dressing and preparation of textiles for printing **tub-** See *tub* **s materials** In textile and paper industries starch, dextrin, gums, gelatin, rosin, tragacanth, albumin, casein, or other substances used to prevent water or ink absorption due to capillary attraction

skatole C_9H_9N = 131 1 Methylindole Colorless leaflets with a strong fecal odor, m 95, b 265, insoluble in water, soluble in alcohol, formed as a decomposition-product of proteins

skatoxyl The monovalent radical, C_9H_8ON, derived from skatole

skeleton symbol An abbreviated structural formula, in which the ring compounds are usually represented as



(see *structure symbols, ring systems*)

skelgas Pentane

skiagenol A vegetable oil containing 20 % iodine, used as a radiopaque oil in radiography

skiagram Radiograph

skiagraph (1) A photograph made by x-rays (2) Scotograph

skiameter A device for measuring the intensity of x-rays preparatory to a photographic exposure

skimmianine $C_{12}H_{29}O_9N_3$ = 599 3 An alkaloid from the Japanese plant, *Skimmia japonica*, a Rutaceae

skimming Removing the dross from molten metal, or the foam and floating substances from liquids in general

skin varnish A preparation for covering skin wounds, as, collodion

skiver A sheepskin, split, and tanned with sumach Cf *roan*

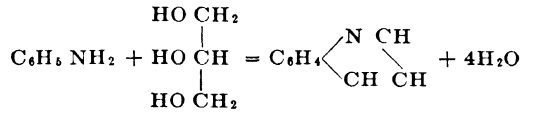
sklero- See *sclero*

skleron An aluminum alloy which contains lithium, copper, zinc, and manganese

sklodowskite A radioactive mineral, $MgO, 2UO_3\ 2SiO_2\ 7H_2O$, from the Belgian Congo Named in honor of Mme Curie (née Sklodowska)

skotography Scotography

Skraup, Zdenko Hans 1850–1910 A Polish chemist, noted for organic synthesis **S synthesis** Quinoline synthesis A ring-formation obtained by heating an aromatic amine with a free ortho-position (as aniline) with glycerin and concentrated sulfuric acid in the presence of an aromatic nitro-body (as nitrobenzene), yield, 75 %



skullcap Scutellaria

skunk The mammal *Mephitis mephitis*, it has an offensively odorous secretion **s bush** Feverbush The leaves of *Garrya Fremontii*, a Cornaceae of California, used as a tonic, it contains garryine **s cabbage** The dried rhizomes of *Symplocarpus foetidus*, an Araceae, used medicinally, as the fluid extract, as a stimulant and antispasmodic

skutterudite $CoAs_3$ A native cobalt arsenide

slack (1) Slake To quench with water (2) Lumpy and damp, as soft coal or lime when exposed to air and water (3) Loose (4) Slow

slacken The mixing of ores with slag to prevent fusion of the non-metallic portions

slag The vitreous mass which separates from fused metals during the melting of ores **basic s** Thomas s A slag composed of calcium phosphate and free lime produced in the manufacture of steel by the basic hearth process, and a valuable fertilizer **Thomas s** Basic s **s wool** A fibrous packing material made by pouring molten slag into a pan with steam injection

slake To slack or loosen

slaked lime Calcium hydroxide

slat A thin flat piece of slate, stone or glass

slate A dense, fine-textured rock whose separate mineral constituents are indistinguishable to the unaided eye It has parallel cleavage planes and breaks into thin plates Cf *shale* **polishing-** A gray or yellow shale, used for polishing

slide A plane glass plate, as, **lantern-** of size 80 × 100 mm (3¼ × 4″) for projection, and **microscope-** of size 25 × 75 mm (1 × 3″) for observation

slide rule A ruler with a medial slide, both scales of which are graduated logarithmically and numbered As the addition of two logarithms equals the product of their two antilogarithms so in the slide rule the addition of two lengths gives the desired result of multiplication, while the subtraction of one length from the other is equivalent to division **chemical-** A slide rule that is labelled with common chemical factors It is used for the rapid calculation of analytical results

slime A fine powder held in suspension, as, the ore mud of ore crushers **s molds** Myxomycetes

slip (1) A fluid suspension of clay, fluxing material and water, used to coat ceramics before final heating, *e g*, ZnO and clay, which gives a glaze

sludge A soft mud, as, the refuse from a coal washing plant or the sediments obtained in the purification of city sewage **activated-** S produced by bubbling air through sewage, thus promoting growth of aerobic bacteria Filtered and dried this forms a useful fertilizer N 4 to 6 %, P_2O_5 2 5 to 4 % **Imhoff-** S produced by the action of anaerobic bacteria, it is

a low-grade fertilizer N 1 5 to 2 5 %, P_2O_5 1 % **s acid** The tarry substance from the bottom of oil refining-tanks, it consists of the impurities from the oil mixed with the strong sulfuric acid used as refining agent **s acid phosphate** A superphosphate manufactured with petroleum sludge acid It has a characteristic odor

slug The mass which acquires an acceleration of 1 foot/sec ^{2} under the free weight of 1 pound **metric-** That mass which acquires an acceleration of 1 meter/sec ^{2} under a free weight of 1 kilogram

sluice A long, inclined flume or trough for washing gold-bearing earth and gravel in a stream of water **s box** A wooden box or trough in which the heavier gold accumulates during the washing of auriferous gravel

sluicing The washing of auriferous earth by a stream of water rushing through long boxes provided with riffles, or other gold-retaining devices

slum The insoluble oxidation-products deposited from lubricating oil They are eliminated by extraction of the oil with suitable solvents

Sm The symbol for samarium (see also *Sa*)

smalt A blue glass or pigment of cobalt, potash and silica

smaltine Smaltite

smaltite $CoAs_2$ Cobalt pyrites Smaltine A native cobalt diarsenide Cf *bismuthosmaltite, speiss cobalt*

smaragd A green variety of beryl, used as a gem

smart weed Waterpepper

smectic Pertaining to liquid crystals of the soap-like type, having disc-shaped molecules Cf *nematic*

smell See *odors*

smelt (1) To obtain metals from their ores by a process which includes fusion In general it includes (a) calcination and roasting to remove sulfur and other volatile constituents, (b) reduction or smelting proper in which the metals are fused and separated from gangue (c) refining, during which the metals are purified (2) The material obtained in stage (b)

smelter, smeltery An establishment or plant where ores are converted into metals

smilacin (1) $C_{18}H_{30}O_6 = 342\ 3$ Salseparin, parilin A glucoside from sarsaparilla (2) $C_{28}H_{42}O_3 = 402\ 3$ A solid, decomp 160

Smilax A genus of climbing plants which includes sarsaparilla and chinaroot (Liliaceae)

Smith, Edgar Fahs 1854–1929 An American chemist, noted for his writings and educational methods

smithite. $AgAsS_2$ A silver sulfide

Smithson, James 1765–1829 An English chemist and mineralogist noted for his bequest which led to the foundation of the Smithsonian Institution

Smithsonian Institution A government establishment in Washington, D C , created by Act of Congress in 1846 according to the terms of the will of James Smithson "to increase and diffuse knowledge among men" It consists of the
- Smithsonian Library
- Bureau of the International Catalogue
- United States National Museum
- National Gallery of Art
- Bureau of American Ethnology
- National Zoological Park
- Astrophysical Observatory

smithsonite $ZnCO_3$ Calamine A native white or yellow carbonate of zinc

smoke The material escaping or expelled from a burning substance It usually consists of a dispersed system of solid carbon in air **s stone** Smoky quartz **s screen** A smoke or fog produced by chemical reactions, which serves to screen vessels or objects from observation During World War I vapors of silicon tetrachloride and ammonia, also oleum or concentrated sulfuric acid injected into smoke stacks, were used

smokeless powder An explosive which consists mainly of nitrocellulose

smokes A colloidal system which consists of a solid phase suspended in a gaseous phase It is also termed, sogasoid, from so(lid) gas(eous)

smoky quartz A smoky, gray or brown colored variety of quartz **s topaz** Smoky quartz used for jewelry

Sn The symbol for tin (stannum)

snake One of a large class of reptiles **s head** Balmony, turtle bloom The leaves of *Chelone glabra* a Scrophulariaceae, used as anthelmintic, tonic and detergent Cf *chelonin* **s lily** Iris **s poison** S venom **s root** Snakeroot **s venom** The proteins secreted by certain s , which cause hemolysis of the blood **s weed** Bistort

snakeroot black- Cimifuga **Canada-** Asarum **Seneca-** Senega **Texas-, Virginia-** Serpentaria

snow A crystalline, finely-divided form of water **carbon dioxide-** Frozen carbon dioxide obtained by rapid evaporation of liquid carbon dioxide It has a temperature of −110°C , and is sometimes mixed with ether, used (as dry ice") in refrigeration **nitrous oxide-** The snow formed by the rapid evaporation of liquid nitrous oxide

soap A salt of one or more of the higher fatty acids with an alkali or metal Soaps may exist in two micro-crystalline forms viz hexagonal plates and curd fibres, and in three types of solution, viz isotropic solutions (including lyes and nigre), and neat and middle soaps, the two latter being conic anisotropic "liquid crystal" forms **Castile-** A soap made from sodium carbonate and olive oil **essence of-** An alcoholic soap solution, used in pharmacy **hard-** An ordinary soap, made with soda They give a poor lather **marine-** Salt water- **metallic-** The salts of heavy metals with oleic, stearic, palmitic, erucic, and lauric acids Used in the paint, varnish and textile industries as siccatives and dryers (Pb, Co, Mn), for waterproofing leather, decolorizing varnish (Zn, Fe, Ni, Co, Cr), waterproofing explosives and textiles (Al, Mg), and as fungicides and sprays (Cu, Hg) **middle-** A phase sometimes formed in soap boiling at concentrations intermediate between those of neat soap and isotropic solutions A conic, anisotropic solution, plastic but inelastic, and darker in color (due to impurities) than neat soap **neat-** The upper layer in the soap pan or kettle It is an anisotropic (liquid crystal) solution containing about 63 % fatty acid for sodium, and 40 % fatty acid for potassium, soaps **potash-** A soft soap made with potassium hydroxide **salt water-** S containing caproic, caprylic, capric and myristic acids, which are not readily precipitated by Ca^{++} and Mg^{++} ions, made from coconut oil **soda-** A hard soap made with sodium hydroxide **soft-** Soap made with potash They give a good lather **toilet-** An ordinary soap containing 70 % or more of fatty and resin acids

transparent- S made transparent by adding methyl alcohol **white curd-** S made from tallow

s bark Quillaia **s root** Saponaria **s tree** Quillaia **s wort** Saponaria

soapstone Talc

Sobrero, Ascanio 1812–1888 An Italian chemist and discoverer of nitroglycerin (1847) Cf *Nobel*

sobrerol Pinol hydrate

sobrerone Pinol

soda Sodium carbonate **baking-** Sodium bicarbonate **caustic-** Sodium hydroxide (solution) **chlorinated-** Sodium hypochlorite Sal-soda carbonate **sesqui-** A molecular mixture of $NaHCO_3$ and Na_2CO_3 **washing-** Sodium carbonate

s alum A double salt of aluminum and sodium sulfates **s ash** A commercial anhydrous sodium carbonate (99 % Na_2CO_3) Used in the manufacture of glass, soap, paper, chemicals, paints, drugs, leather, enamel ware, cleansers, in metallurgy, dyeing, refining oils, the textile industry, and many other chemical processes **s feldspar** Albite **s lime** See *sodium hydroxide with lime* **s nitre** Native sodium nitrate **s process** (1) A method of manufacturing sodium carbonate (See *Le Blanc Solvay processes*) (2) See *soda pulp* **s pulp** Wood fibers obtained by digesting chipped wood with sodium hydroxide under 100 pounds per sq in pressure, used in the manufacture of paper **s water** A beverage made by injecting CO_2 into a solution of Na_2CO_3 cf aerated or mineral *waters*

sodalite $Na_4Al_3Si_3O_{12}Cl$ A silicate of aluminum and sodium, which contains salt

sodamide Sodium amide

Soddy, Frederick 1877– An English chemist, noted for his researches on radioactive elements and Nobel Prize (1921) in chemistry

sodic Containing sodium (An obsolete term)

sodio-malonic Sodium malonic

sodion Same as sodium ion Na^+

sodium Na = 22 997 Natrium An alkali metal element, atomic number 11 A tetragonal crystalline, soft metal, silvery-white when freshly cut but rapidly becoming dull on exposure to air It is stored under coal oil It becomes brittle at low temperature, $d_{18°}$ - 0 9732, m 97, b 880, decomp water, insoluble in alcohol, benzene, or ether Marggraf differentiated soda and potash in 1757, and Davy isolated the metal in 1807 Used as a reagent, a reducing agent, a dehydrating agent, a flux, and in organic synthesis, for the manufacture of NaCN, Na_2O, Na_2O_2, indigo, antipyrine, acetoacetic ester, tetraethyl lead, sodium azide **radio-** The isotope of mass 24, having a half-life of 15 5 hours, and formed from Na by bombardment with deuterons $_{11}Na^{23} + {}_1D^2 \rightarrow {}_{11}Na^{24} + {}_1H^1$ It decomposes to magnesium with emission of β-rays (electrons) It can also be produced by neutron bombardment of Na, Mg and Al

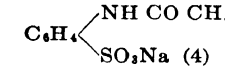
$$_{11}Na^{23} + {}_0n^1 \rightarrow {}_{11}Na^{24}$$
$$_{12}Mg^{24} + {}_0n^1 \rightarrow {}_{11}Na^{24} + {}_1H^1$$
$$_{13}Al^{27} + {}_0n^1 \rightarrow {}_{11}Na^{24} + {}_2He^4$$

Used as a synthetic radioactive element in medical research

PHYSICAL PROPERTIES OF SODIUM

m 97 6°C, b 880°C
$d_0°$ 0 9721, $d_{97\ 6(s)}$ 0 9519, $d_{97\ 6(l)}$ 0 9219, $d_{880°(l)}$ 0 7414
Surface tension 293 6 dyne/cm (against CO_2 at 97 6°C)
Electric conductivity at 0°C 19 84 × 10^4 mho, at 75°C 17 1 × 10^4 mho
Thermal conductivity 0 305 cal /cm /cm ^{2}/sec at −100°C, 0 335 at 0°C, 0 270 at 75°C
Specific heat (solid) 0 2930 at 0°C 0 3266 at 97 6°C , (liquid) 0 334 at 97 6°C , 0 3369 at 100°C
Heat of vaporization 1100 cal /gm at 880°C
Heat of fusion 27 21 cal /gm at 97 6°C
Critical temperature 2000°C Critical pressure 343 atm

s abietinate S sylvate **s acetate** $NaC_2H_3O_2$ = 82 0 CH_3COONa Colorless monoclinic crystals, d 1 4, m 58, soluble in water alcohol or ether Used as a mordant, in the manufacture of acetic acid, acetic ether, pigments, in photography, for filling thermophores, as a reagent for alkaloids, and in quantitative analysis *hydrated-* $NaC_2H_3O_2\ 3H_2O$ = 136 07 Monoclinic, colorless crystals d 1 45 m 58 Soluble in water **s acetotungstate** $Na_2(CH_3CO)WO_4$ = 337 0 S acetwolframate A white crystalline powder, soluble in water, used as a microscope reagent **s acetsulfanilate** $NaC_8H_8O_4S$ = 223 0 Cosaprin,



A greenish-white, fine crystalline powder, soluble in water and slightly soluble in alcohol Used medicinally **s acetwolframate** S acetotungstate **s acetylarsanilate** $NaAsO_2\ C_6H_4\ NHCOCH_3$ = 264 1 A yellowish crystalline powder, soluble in water, used medicinally **s acetyl salicylate** $C_2H_3O\ OC_6H_4COONa$ = 202 06 Hydropirin, pyranol, used medicinally **s agaricinate** A colorless powder, soluble in water, used medicinally **s alginate** The sodium salt of alginic acid, used as antisettling agent for chocolate-milk drinks, as a gelatin substitute in ice cream, and as protective colloid in pharmaceuticals and cosmetics **s alizarinsulfonate** $NaC_{14}H_5O_2(OH)_2SO_3$ = 342 1 Alizarin carmine An orange-yellow powder, soluble in water or alcohol Used as a dye, and indicator for strong acids (yellow) and strong alkalis (violet) (except carbonates) **s alloys** A mixture of sodium with some other metal (for m , see table)

with	90 % Na 10 %	80 % Na 20 %	70 % Na 30 %	60 % Na 40 %	50 % Na 50 %
Bi	425	520	590	645	690
Cd	125	185	245	285	325
Hg	90	80	70	60	45
K	77	58	41	26	11
Pb	130	200	250	290	330

s alum Aluminum s sulfate **s aluminate** $Na_2Al_2O_4$ = 164 2 A colorless amorphous powder, m 1850, soluble in water, or alcohol, insoluble in alkalis or ether **s aluminum chloride** $2NaCl,AlCl_3$ = 383 7 A colorless deliquescent solid, m 185 **s amalgam** A mercury amalgam with 2 % to 10 % of sodium Gray pieces, the size of a pea used as a reducing agent and in organic synthesis **s amide** $NaNH_2$ = 39 03 Sodamide Colorless crystals, m 208, sublimes 400, decomp by water Used in organic synthesis similarly to sodium, but should not be kept longer than 12 hours as it forms explosive products when exposed to air **s aminosuccinate** S asparaginate **s ammonium acid phosphate** Sodium ammonium phosphate **s ammonium phosphate** $NaNH_4HPO_4\,4H_2O$ = 209 15 Microcosmic salt, triphosphate, acid sodium ammonium phosphate Colorless crystals, soluble in water Used as a reagent in blowpipe analysis, for standardizing uranium solutions, and in the determination of magnesium and manganese Decomposed by heat, and forms a molten bead which is colored characteristically by impurities **s ammonium sulfate** $NaNH_4SO_4$ = 137 1 Colorless crystals, soluble in water **s amylsulfate** $C_5H_{11}SO_4Na$ = 202 2 A colorless crystalline powder, soluble in water **s amylxanthogenate** $NaC_6H_{11}OS_2$ = 186 1 $Me_2CH\,CH_2\,CH_2\,O\text{-}CS_2Na$ Yellowish crystals, soluble in water, used as a bactericide and insecticide **s amytal** Isoamyl ethyl barbiturate A white powder, soluble in water, used as a basal hypnotic for intravenous injection **s anhydromethylenecitrate** Citarin **s aniline sulfonate** S sulfanilate **s anisate** $NaC_8H_7O_3$ = 174 1 $C_6H_4(OMe)COONa$ White crystals, soluble in water Used medicinally as an antipyretic and antirheumatic **s anthranilate** $NaC_7H_6O_2N$ = 159 1 Sodium orthoaminobenzoate, $NH_2\text{-}C_6H_4\,COONa$ A grayish powder soluble in water or alcohol, used as an antiseptic **s anthrarobinate** A sodium salt of anthrarobin A dark-brown powder, soluble in water or alcohol, used medicinally for skin diseases **s antimonate** $2NaSbO_3,7H_2O$ = 508 5 Colorless octahedral crystals, slightly soluble in water or alcohol *pyro-* See *sodium pyroantimonate* **s antimony tartrate** Plimmer's salt, $Na(SbO)C_4H_4O_6$ Colorless, transparent crystals, soluble in water **s argentocyanide** $NaAg(CN)_2$ = 182 90 Silver cyanide A yellow, soluble solid produced in the cyanide process for the extraction of silver **s arsanilate** $Na(AsO_2)C_6H_4NH_2$ = 222 2 Colorless crystals, soluble in water or alcohol **s arsenates** *normal-* $Na_3AsO_4\,12H_2O$ = 424 2 Colorless crystals, d 1 754, m 85, soluble in water or alcohol, used as a reagent *s arsenate, acid-* (1) $Na_2HAsO_4\,12H_2O$ = 402 2 (Dodecahydrate) Colorless monoclinic or rhombic crystals, d 1 71, m 28, b 100, soluble in water or alcohol (2) $Na_2HAsO_4\,7H_2O$ = 312 1 (Heptahydrate) Colorless monoclinic prisms, m 57, b 100, soluble in water or alcohol, used as a reagent, and medicinally as a tonic and antiseptic (3) Na_2HAsO_4 = 186 0 (Anhydrous) A white amorphous powder, soluble in water or alcohol, used in dyeing and printing textiles **s arsenide** Na_3As = 143 96 A dark solid, which evolves arsine in presence of water **s arsenite** $NaAsO_2$ = 129 9 (meta-) or Na_2HAsO_3 = 170 0 (ortho-) A grayish-white powder, d 1 87, soluble in water or alcohol used in the manufacture of antiseptic soap, in the leather industry and as a parasiticide **s asparaginate** $NaC_4H_6O_4N$ = 155 1 Sodium aminosuccinate, $HOOC\,CH_2\,CHNH_2\,COONa$ Colorless rhombic needles, soluble in water **s arsphenamine** The sodium salt of salvarsan **s auribromide** Gold sodium bromide **s aurichloride** Gold sodium chloride **s aurosulfide** $NaAuS\,4H_2O$ = 324 33 Colorless crystals **s azide** NaN_3 = 65 1 An explosive solid used in detonators **s azo-a-naphthol-sulfanilate** Tropeolin **s barbitone** Barbital sodium **s benzene sulfonate** $NaC_6H_5SO_3$ = 180 1 Sodium sulfobenzene, $Ph\text{-}SO_3Na$ A colorless crystalline powder, soluble in water or alcohol **s benzoate** $NaC_7H_5O_2$ = 144 0 A white amorphous powder or colorless crystals soluble in water or alcohol, used medicinally as an antiseptic and antipyretic **s benzosulfinide** $NaC_7H_4O_3NS\,2H_2O$ = 241 2 Soluble gluside, soluble saccharin The sodium salt of saccharin, sodium benzoylsulfonate $C_6H_4CO\,SO_2\,N\,NA$ Colorless crystals, soluble in water, used medicinally as an intestinal antiseptic **s benzosulfite** A colorless crystalline powder used as an antiseptic **s benzoylsulfonate** S benzosulfinide **s biborate** S borate **s bicarbonate** $NaHCO_3$ = 84 01 Acid sodium carbonate baking soda A white opaque powder or colorless crystals, d 2 206, decomp 270, soluble in water, insoluble in alcohol Used as a reagent, in making volumetric solutions, medicinally as an antiacid, pharmaceutically in effervescent mixtures, and in baking powders **s bichromate** S dichromate **s bifluoride** $NaHF_2$ = 62 0 An acid salt, $NaF\,HF$ Colorless, crystalline powder, soluble in water Used as a powerful antiseptic, in ant powders, preservatives and for etching glass **s bilactate** $NaH(C_3H_5O_3)_2$ = 202 1 A colorless liquid, soluble in water **s binoxalate** $NaHC_2O_4$ = 112 0 Acid sodium oxalate Colorless monoclinic crystals, soluble in water, used in stain and ink removers **s biphosphate** See *s phosphates* **s bipyrophosphate** See *s pyrophosphate* **s bismuthate** $NaBiO_3$ = 280 0 A light, fawn colored powder, used in Mn determinations **s bismuth thiosulfate** $Na_3Bi(S_2O_3)_3$ = 614 42 A colorless crystalline solid **s bisulfate** $NaHSO_4\,H_2O$ = 138 1 Acid sodium sulfate Large colorless crystals, d 1 8, m 300, soluble in water Used as a reagent, as a flux for decomposing minerals, in thermophores, and as an antiseptic for drinking water **s bisulfite** $NaHSO_3$ = 104 07 A white crystalline powder, soluble in water, insoluble in alcohol Used as a reagent and reducing agent in qualitative and quantitative analysis, as a disinfectant and bleach, as a preservative, as an antiseptic in the fermentation industry, also medicinally **s bitartrate** $NaHC_4H_4O_6\,H_2O$ = 190 08 Colorless crystals or powder, soluble in water Used as a reagent and in effervescent mixtures **s borates** (1a) *S metaborate* $NaBO_2$ = 66 0 Colorless hexagonal prisms, m 966, soluble in water, alcohol or ether (1b) *S metaborate, tetrahydrate* $NaBO_2\,4H_2O$ = 203 6 Neutral sodium borate Colorless monoclinic prisms, m 57, soluble in water, alcohol or ether, used as an antiseptic (2a) *S tetraborate, calcined* $Na_2B_4O_7$ = 202 0 A white

spongy mass or powder, soluble in water, used as a reagent (2b) *S tetraborate, fused* $Na_2B_4O_7$ = 202 0 Borax glass, anhydrous borax A colorless vitreous mass, d 2 367, m 741, slightly soluble in water, soluble in alcohol, insoluble in ether, used as a reagent (2c) *S tetraborate, pentahydrate* $Na_2B_4O_7$ - $5H_2O$ = 292 1 Colorless octahedral crystals, d 1 815, slightly soluble in water or alcohol, insoluble in ether, used as a reagent (2d) *S tetraborate, decahydrate* $Na_2B_4O_7$ $10H_2O$ = 382 2 Borax, sodii boras, (U S P), sodium biborate, s pyroborate Colorless monoclinic crystals or white powder, d $_{17}$°1 72, m at red heat, slightly soluble in water, insoluble in alcohol Used as a reagent and flux, in blowpipe analysis, for borax beads, in metallurgy, as a preservative, and as an antiseptic **s borosalicylate** Borsalyl, a reaction product of salicylic acid and sodium borate A white powder, soluble in water, used medicinally as an antiseptic **s bromate** $NaBrO_3$ = 150 9 Colorless, lustrous crystals, d 3 339, m 384, soluble in water or alcohol insoluble in ether, used as a reagent and oxidizing agent, in volumetric analysis and in the determination of phenols **s bromides** (1) NaBr = 102 9 Colorless cubic crystals, d 3 014, m 768, soluble in water, ether or alcohol Used as a reagent and medicinally as an alternative and diuretic (2) NaBr $2H_2O$ = 138 95 Colorless monoclinic crystals, d 2 176, soluble in water, alcohol or ether **s butylsulfate** $NaSO_4C_4H_9$ = 176 1 Colorless crystals, soluble in water **s butyrate** $NaC_4H_7O_2$ = 110 06 or C_3H_7COONa Colorless deliquescent crystals, soluble in water, used in organic synthesis **s cacodylate** $NaAsO_2(CH_3)_2$ = 160 02 and $NaAsO_2Me_2$ - $3H_2O$ = 214 17 A white amorphous powder, soluble in water Used medicinally, especially in ampoule medication as a hematinic **s caffeine sulfonate** Symphorol N **s camphorate** $Na_2C_{10}H_{14}O_4$ = 244 2 A white deliquescent powder, soluble in water, used medicinally as an antiseptic **s cantharidate** $Na_2C_{10}H_{14}O_6$ $2H_2O$ = 312 2 The sodium salt of cantharides camphor, the active principle of *Cantharis vesicatoria* A white crystalline powder, soluble in water, used medicinally as a tonic **s carbide** Na_2C = 58 0 A gray powder, decomp by water **s carbolate** S phenate **s carbonate** Soda, washing soda Cf *Solvay process, ammonia soda process* There are several hydrated forms (1) *Anhydrous* Na_2CO_3 = 106 0 A white powder, d 2 476, m 852, decomp by further heat, soluble in water Used as a reagent and in freezing mixtures Cf *sesquisoda, soda ash* (2) *Monohydrate* Na_2CO_3 H_2O = 124 0 A white, crystalline powder, soluble in water, insoluble in ether, used as a reagent and in photography (3) *Decahydrate* Na_2CO_3 $10H_2O$ = 286 2 Colorless monoclinic crystals, d 1 458, m 34, b 106, soluble in water, insoluble in alcohol or ether Used as a reagent, precipitant and neutralizer, for volumetric solutions, medicinally as an antiacid, and in large amounts as soda ash (q v) (4) *Peroxide form* Na_2CO_3 $1\frac{1}{2}H_2O_2$ = 157 01 This was formerly regarded as a peroxide **s carminate** $Na_2C_{11}H_{10}O_6$ = 284 1 A red powder, soluble in water, used as a dye in microscopy **s chlorate** $NaClO_3$ = 106 5 Colorless cubic or tetragonal crystals, d 2 490, m 250, decomp by further heat, soluble in water, slightly soluble in alcohol or ether Used as a reagent, in explosives and pyrotechnics, medicinally as antiseptic in toothpastes, and gargles **s chloride** NaCl = 58 5 Table salt, common salt, rock salt, sea salt Colorless cubic crystals or crystalline powder, d 2 176, m 800, soluble in water insoluble in alcohol or ether Used as a reagent, as a condiment, for freezing mixtures and reducing chlorine, and in industry and technology for many purposes **s chlorite** $NaClO_2$ = 90 5 A colorless crystalline powder, soluble in water, used as an oxidizing agent **s *p*-chlorobenzoate** Mikrobin **s chloroplatinate** S platini chloride **s chloroplatinite** S platino chloride **s chlorosulfonate** $NaClSO_3$ = 138 7 A fine crystalline powder readily hydrolysed to HCl, used as a reagent in sulfonation and chlorination **s cholate** former name for bile salts, q v **s chromate** Na_2CrO_4 $10H_2O$ = 342 2 Yellow triclinic crystals, d 2 71, m 20, soluble in water, slightly soluble in alcohol or ether, used as a reagent and mordant, and in organic synthesis **chromite** Na_2CrO_3 = 146 1 Bright green needles, soluble in water **s cinnamate** $NaC_9H_7O_2$ = 170 1 Hetol A white crystalline powder, soluble in water, used medicinally **s citrate** $2Na_3C_6H_5O_7$ $11H_2O$ = 714 3 Sodii citras (U S P) Colorless crystals, m 15 soluble in water slightly soluble in alcohol or ether Used as a reagent, and medicinally as an antipyretic and refrigerant **coerulinsulfate** Indigo carmine **s cyanaurite** Aurous s cyanide **s cobaltic nitrite, cobaltinitrite** $Na_3Co(NO_2)_6$ $\frac{1}{2}H_2O$ = 413 A dark purple hygroscopic, crystalline powder soluble in water **s cobaltic nitrite solution** clear, brown solution of 4 gm cobaltous chloride 10 gm sodium nitrite, and 2 cc acetic acid (36 %) in 100 cc water, used as a reagent for potassium **s cobaltinitrite** S cobaltic nitrite **s copaivate** $C_{20}H_{29}O_2Na$ = 324 24 yellowish powder, soluble in water, used as a antiseptic **s corallinate** Sodium rosolate **s cyanamide** Na_2NCN = 86 02 **s cyanide** NaCN = 49 01 A white, deliquescent, crystalline powder, soluble in water, slightly soluble in alcohol or ether Used in electroplating, case-hardening, flotation and extraction of metals (cyanide process), fumigation, synthesis of fine chemicals and rubber accelerators as a reagent, parasiticide and antiseptic **s dichromate** $Na_2Cr_2O_7$ $2H_2O$ = 298 0 S bichromate Red, triclinic crystals, d 2 52, m 320, decomp 400, soluble in water, insoluble in alcohol Used as a reagent, as an oxidizing substance, and medicinally as an antiseptic **s diethylbarbiturate** $NaC_8H_{11}O_3N_2$ = 206 1 Barbital-sodium, the monosodium salt of barbital White crystals, soluble in water insoluble in alcohol or ether, used medicinally as a hypnotic **s diethyl dithiocarbamate** Et_2N CS SNa = 171 2 A white solid, a sensitive reagent for copper **s dihydrogen phosphate** See *S phosphates monobasic* **dimethylaminoazobenzenesulfonate** Methyl orange **s dinitrocresolate** Antinonnin **dioxide** S peroxide **s disulfate** S pyrosulfate **s dithionate** S hyposulfate **dithiosalicylate** Dithion **s divanadate** $Na_2V_4O_{11}$ $9H_2O$ = 589 0 S tetravanadate Orange red crystals, slightly soluble in water used in the manufacture of dyes and inks

ethoxide S ethylate **s ethylate** NaC_2H_5O = 68 0 EtONa S ethoxide A white hygroscopic powder, soluble in water or alcohol, used as a reagent, and medicinally as an escharotic **s ethylsulfate** $NaC_2H_5SO_4$ = 148 11 S sulfovinate A colorless deliquescent, crystalline powder, soluble in water or alcohol **s ferricyanide** $Na_3Fe(CN)_6 H_2O$ = 298 93 Red prussiate of soda Ruby-red, hygroscopic crystals, soluble in water, insoluble in alcohol or ether Used as a reagent, and in the manufacture of pigments and blue-print paper **s ferric oxalate** $2Na_3Fe(C_2O_4)_3 10H_2O$ = 957 82 Monoclinic green crystals, d 1 973, dehydrated at 100° ($4H_2O$) and 200°C ($10H_2O$) soluble in water **s ferrite** $Na_2Fe_2O_4$ = 221 7 , An unstable salt of sodium, decomposed by water **s ferrocyanide** $Na_4Fe(CN)_6 12H_2O$ = 520 18 Yellow prussiate of soda Yellow monoclinic prisms, d 1 458, soluble in water, insoluble in alcohol or ether Used as a reagent in photography, and in the manufacture of pigments **s fluobenzoate** $C_6H_4FCOONa$ = 162 0 A white crystalline powder, soluble in water, used medicinally as an antiseptic **s fluorescein** Uranin **s fluoride** NaF = 42 0 Colorless cubic crystals, d 2 766, m 982, soluble in water, slightly soluble in alcohol or ether Used as a reagent for blood, as an antiferment in the brewing industry, yeast manufacture, and distilleries, medicinally, as an antiseptic **s fluosilicate** Na_2SiF_6 = 188 05 S silicofluoride, salufer A white crystalline powder, d 2 755, slightly soluble in water, insoluble in alcohol or ether It is a by-product of superphosphate manufacture, used as reagent, antiseptic and insecticide, also in enameling and laundering **s formaldehyde sulfoxylate** $NaHSO_2 HCHO 2H_2O$ A reducing agent used in the dyeing industry **s formate** $NaCHO_2$ = 68 0 or HCOONa Colorless rhombic crystals, d 1 919, decomp by heat, soluble in water, alcohol or glycerol Used as reagent for arsenic and phosphorus, and as an antiseptic **s furacrylate** C_4H_3OCH $CHCOONa$ = 160 03 A light brown powder d 1 919, soluble in water **s germanate** Na_2GeO_3 = 166 0 Colorless crystals, soluble in water, used as a hematinic **s glycerinophosphate, s glycerophosphate** $Na_2C_3H_7PO_6 xH_2O$ A yellowish viscid liquid, soluble in water Used extensively in ampoule medication as a tonic and hematinic, also as reagent for phosphatase **s gynocardate** $NaC_{14}H_{23}O_2$ = 246 0 A yellow powder, soluble in water or alcohol, used medicinally as an antiseptic **s halides** The sodium salts of the halogen acids, as NaF, NaCl, NaBr and NaI **s hippurate** $NaC_9H_8O_3N$ = 201 07 A white powder, soluble in hot water, used medicinally **s hydrate** S hydroxide **s hydride** NaH = 24 01 Colorless crystals, d 0 92, decomp by water or heat **s hydrogen arsenate** $Na_2HAsO_4 12H_2O$ = 402 21 A solid, d 1 6, fairly soluble in water **s hydrogen arsenite** Na_2HAsO_3 = 169 97 A colorless solid, d 1 87, soluble in water **s hydrogen carbonate** S bicarbonate **s hydrogen oxide** S hydroxide **s hydrogen peroxide** (1) Sodyl hydroxide (2) $2NaOH \cdot H_2O_2$ = 148 04 A white solid **s hydrogen phosphate** See *s phosphates* **s hydrogen phosphite** See *s phosphites* **s hydrogen sulfate** S bisulfate **s hydrogen sulfide** S hydrosulfide **s hydropyroantimonate** S metantimonate **s hydrosulfate** S sulfhydrate **s hydrosulfide** $NaHS 2H_2O$ = 92 10 S hydrogen sulfide Deliquescent, colorless crystals, decomp by heat, soluble in water or alcohol **s hydrosulfite** $Na_2S_2O_4 2H_2O$ = 210 1 Colorless crystals, decomp at red heat, soluble in water, insoluble in alcohol **s hydroxide** NaOH = 40 01 S hydrate, soda, caustic soda, sodii hydroxidum (U S P) A white, very hygroscopic powder, or white flakes, plates, pellets, or sticks, d 2 13, m 318, very soluble in water, alcohol, or ether Used extensively in chemistry, the chemical industry, metallurgy, photography, and sold in various degrees of purity

(1) reagent from sodium—for special analytical work
(2) reagent from alcohol—for general analytical work, volumetric solutions etc
(3) reagent purified—for general analytical and chemical work
(4) U S P or B P —for pharmaceutical work
(5) technical—fused or in flakes for industrial purposes

s hydroxide solution An aqueous solution of s hydroxide Commercial grades

(1) 31 % solution, d 1 34
(2) 27 % solution, d 1 30
(3) 15 % solution, d 1 17
(4) 5 % solution, d 1 06

The solutions employed in the laboratory have the following strengths

6M solution —240 03 gm NaOH per 1000 cc
N or M solution —40 005 grams NaOH per 1000 cc
N/2 solution—20 0025 grams NaOH per 1000 cc
N/10 solution —4 0005 grams NaOH per 1000 cc

s hydroxide with lime Soda-lime A mixture of sodium hydroxide and calcium oxide A white granular powder, or porous mass, used as a reagent as a general absorbent for acid gases and carbon dioxide in particular, in absorption tubes and in scrubbers **s hydroxylamine sulfonates** mono- $HO NH(SO_3Na)$ = 135 40 di- $HO N (SO_3Na)_2$ = 237 16 **s hypobromite** NaOBr = 119 0 A colorless powder, soluble in water used as an oxidizer in organic synthesis **s hypochlorite** NaOCl = 74 5 A colorless powder decomp by heat, soluble in water, decomposed by ether Used as a reagent, an oxidizing agent, and a bleaching agent Cf *Eau de Javelle, Carrel-Dakin-, Dakin-, Labarraque solutions* **s hyponitrite** $Na_2N_2O_2$ = 106 0 A colorless crystalline powder, soluble in water **s hypophosphite** $NaH_2PO_2 H_2O$ = 106 1 Colorless deliquescent monoclinic prisms or white granular powder, soluble in water, alcohol or ether Used as a reagent in gas analysis, and medicinally as a tonic **s hyposulfate** (1) $Na_2S_2O_6 2H_2O$ = 242 1 Sodium dithionate Large transparent rhombic prisms soluble in water, insoluble in alcohol (2) S thiosulfate **s hyposulfite** (1) $Na_2S_2O_4$ = 174 1 S hydrosulfite Colorless crystals, soluble in water, used to recover silver from photographic waste (2) S thiosulfate (3) S bisulfite **s indigotinsulfonate** Indigo carmine **s iodate** $NaIO_3$ = 197 9 A white powder, d 4 277, decomp by heat, soluble in water, insoluble in alcohol or ether, used as a reagent It may contain 5 mols

of water of crystallization **s iodide** NaI = 149 9 Colorless cubic crystals, d 3 665, m 664, soluble in water, alcohol or ether, used as a reagent, and medicinally as an alterant *dihydrate* NaI $2H_2O$ = 185 9 Colorless crystals, d 2 448, soluble in water, alcohol or ether **s iodoeosin** Erythrosin **s iodotheobromate** Theobromine sodium iodide **s ion** The monovalent cation, Na^+ **s iridichloride** Iridium sodium chloride **s iron pyrophosphate** $Na_8Fe_2(P_2O_7)_3$ = 818 4 Used as a catalyst in carbohydrate oxidation **s kussinate** The s salt of koussein A light-brown amorphous powder, soluble in water or alcohol, used medicinally as a teniafuge **s lactate** $NaC_3H_5O_3$ = 112 06 A thick syruplike liquid, soluble in water or alcohol, used medicinally **s lauryl sulfate** $NaC_{12}H_{25}SO_4$ = 288 3 Irium A white powder, used as detergent in toothpastes **s lorinate** Griserin A yellowish powder, soluble in water, used medicinally **s lygosinate** The sodium salt of diorthocumareketone (see *lygosin*) **s magnesium tartrate** $Na_2Mg(C_4H_4O_6)_2\ 10H_2O$ = 546 53 A white powder soluble in water **s malate** $Na_2C_4H_4O_5$ = 178 1 Colorless crystals, soluble in water **s malonic ester** $NaC_7H_{11}O_4$ = 182 1 Sodio-malonic ester, EtO(NaO)C CH COOEt White needles Formed, but not usually isolated, in the malonic ester synthesis **s manganate** Na_2MnO_4-$10H_2O$ = 345 1 Green monoclinic crystals, decomp by heat, soluble in water, decomp by alcohol **s metabisulfite** $Na_2S_2O_5$ = 190 14 White crystals, soluble in water, used in photography **s metaborate** See *s borates* **s metantimonate** $Na_2H_2Sb_2O_5$ = 400 0 S hydropyroantimonate A white granular powder, slightly soluble in hot water **s metaphosphate** $Na_4P_4O_{12}$ = 408 16 Colorless, transparent sticks, insoluble in water **s metasilicate** See *s silicates* **s metastannate** $Na_2Sn_5O_{11}$, $4H_2O$ = 887 6 A crystalline powder, insoluble in alcohol **s metavanadate** $NaVO_3$ = 122 2 A pale-green crystalline powder, soluble in hot water, used as a reagent, and medicinally **s methyl arsenate** See *methyl* **s methyl arsenite** $NaCH_3AsO_3$ = 184 0 Disodium methylarsonate, mono-methyldisodiumarsenate, arrhenal, arsynal, neoarsycodyl, stenosine Colorless crystals, m 135, soluble in water, slightly soluble in alcohol, insoluble in ether, used medicinally instead of cacodylates **s methylate** $NaCH_3O$ = 54 0 MeONa A white powder, decomp by water, soluble in alcohol **s methylsulfate** $NaCH_3SO_4$ = 134 09 Colorless hygroscopic crystals, soluble in water or alcohol **s molybdate** Na_2MoO_4-$2H_2O$ = 242 0 Colorless leaflets with mother-of-pearl luster, soluble in water, used as a reagent **s molybdophosphate** S phosphomolybdate **s monosulfide** S sulfide **s monoxide** S oxide Na_2O **s morrhuate** The sodium salt of a fraction of the fatty acids of codliver oil having a high iodine content, used to treat varicose veins **s naphthionate** S naphthylamine sulfonate **s naphtholsulfonate** $NaC_{10}H_7SO_4$ = 246 1 S -β-naphthol-α-sulfonate White tablets, soluble in water or alcohol **s naphthoquinone sulfonate** A white powder, used as reagent for nitrogen in amino acids **s naphthylaminesulfonate** $NaC_{10}H_6NH_2SO_4$ = 261 1 S naphthionate Colorless monoclinic prisms, soluble in wat used as a reagent for nitrous acid **s nitranila** $Na_2C_6O_6N_2$ = 274 02 S dinitrodioxyquino ate, $C_6(NO_2)_2O_2(ONa)_2$ A brown powd soluble in water **s nitrate** $NaNO_3$ = 85 (Saliter Soda nitre, cubic nitre, caliche, Ch saltpetre Colorless rhombohedral crystals, 2 265, m 312, soluble in water, slightly solut in alcohol Used as a reagent and oxidiz in organic synthesis, in the manufacture of acic fertilizers, explosives and glass, as a flux in meta lurgy, and medicinally **s nitrite** NaN = 69 01 Colorless crystals or white, slight yellow sticks, d 2 167, m 271, soluble in wate slightly soluble in alcohol, ether, or benzen Used as a reagent, in the manufacture of az dyes and synthetics, and medicinally as diuretic and diaphoretic, also for sea-sickne Cf *mystin* **s** *6*-**nitro-6-chlorotoluene-3-sulfonate** A white powder, a reagent for potassium **s nitroferricyanide** $Na_2Fe(CN)_5NO$ $2H_2O$ = 297 8 S nitroprusside Dark re transparent crystals, d 1 680, soluble in wate Used as a reagent for alkali sulfides, aceton formaldehyde aminoacids, and alkaloids **nitronaphthalenesulfonate** $NaC_{10}H_6(NO_2)SO$ = 275 0 A brownish-yellow powder, soluble water, used in organic synthesis **s nitroprussiate** S nitroferricyanide **s nitropruside** S nitroferricyanide **s nitrosohydroxylamine sulfonate** ON N(ONa)SO_3Na 186 09 **s nucleate** S nucleinate **s nucleinate** S nucleate The sodium salt nucleic acids of yeast A grayish-white powde soluble in water and insoluble in alcohol, use medicinally as a tonic and for syphilis **oenanthate** $NaC_7H_{13}O_2$ = 152 1 The s dium salt of n-heptylic acid, $Me(CH_2)_5COON$ A white crystalline powder, soluble in alcoh or water **s oleate** $NaC_{18}H_{33}O_2$ = 304 Yellow, unctuous granules, soluble in water alcohol **s orthoaminobenzoate** S anthranilate **s orthovanadate** See *s vanadate* **oxalate** $Na_2C_2O_4$ = 134 0 A white crystalline powder, soluble in water Used as reagent, and in the manufacture of stain and in removers *acid-* NaOOC COOH H_2O = 130 0 Colorless monoclinic crystals soluble in wate **s oxide** Na_2O = 62 0 S monoxide grayish or white mass, d 2 7, subliming an m at red heat, and decomp by water (t form sodium hydroxide), alcohol or ether Use as a reagent and strong base, similarly to sodiu hydroxide **s para-periodate** $Na_3H_2IO_6$ 293 9 A crystalline solid, used as an oxidisin agent in quantitative analysis **s pentasulfid** See *s sulfides* **s pentobarbital** White pow der, used for seasickness **s pentoxydichlorid** Cl_2SO_2 SO_2Cl_2 = 215 4 A straw-colored li uid, b 150, slightly soluble in cold water, bu reacting violently with warm water **s perbo rate** $NaBO_3\ 4H_2O$ = 154 1 Peroxydol white crystalline powder, soluble in wate Used as a reagent, oxidizing agent, antisepti deodorant and bleaching agent for textile rayon and vat colors, also in dentifrices an detergents **s percarbonates** (1) *normal* Na C_2O_6 = 166 00 (2) *mono-* Na_2CO_4 = 122 0 **s perchlorate** $NaClO_4$ = 122 5 Colorle rhombohedral crystals, m 482, decomp b further heat, soluble in water, alcohol or ethe used as a reagent, and in explosives **periodate** $NaIO_4\ 3H_2O$ = 267 9 Efflore

cent hemihedral crystals, d $_{15}$°3 219, dehydrated at 300, soluble in water **s permanganate** $Na_2MnO_4\,3H_2O$ = 218 98 Purple or reddish-black crystals, decomp by heat, soluble in water or alcohol Used as a reagent and oxidizing agent, and medicinally as an antidote to poisoning from snake bites morphine or curare **s peroxide** Na_2O_2 = 78 0 S dioxide, s superoxide A white or yellowish powder, d 2 805, decomp by heat, soluble in water with production of heat, sodium hydroxide and hydrogen peroxide Used as a powerful oxidizer for destroying organic matter in analysis, as a flux for minerals, in bleaching animal or vegetable tissues, *e g* , flour, in the preparation of calcium peroxide, sodium perborate and ferrate It should be used with caution as it is liable to ignite organic matter or alcohol **s persulfate** $Na_2S_2O_8$ = 238 0 A white crystalline powder, soluble in w ter Used as a reagent for indican, adrenalin and other organic substances, as a strong antiseptic and bleaching agent and medicinally as an aperient **s phenate** NaC_6H_5O = 116 0 S carbolate, PhONa A colorless hygroscopic powder, soluble in water, used medicinally as an antiseptic **s phenolphthaleinate** $Na_2C_{20}H_{12}O_4$ = 362 1 A red syrupy mass soluble in water **s phenolsulfonate** $NaC_6H_5O_4S$ = 196 1 S p-phenolsulfonate, s sulfocarbolate, $C_6H_4(OH)SO_3Na$ Colorless crystals, soluble in water and slightly soluble in alcohol, used medicinally as an antiseptic and disinfectant **s phenylethyl barbiturate** Luminal-sodium phenobarbital sodium, the monosodium salt of luminal A white, hygroscopic powder, m 147, soluble in water, used medicinally as a hypnotic **s *o*-phenylphenate** $C_{12}H_9ONa$ = 192 1 Ph C_6H_4ONa A white powder used as preservative of glues Cf *phenylphenol* **s phosphates**

(1) $Na_3PO_4\,12H_2O$ = 380 2, tribasic
(2) Na_2HPO_4 = 142 0, dibasic, anhydrous
(3) $Na_2HPO_4\,12H_2O$ = 358 2, dibasic, hydrous
(4) $NaH_2PO_4\,H_2O$ = 138 1, monobasic
(5) $NaPO_3$ = 102 05, metaphosphate
(6) $Na_4P_2O_7\,10H_2O$ = 446 24, pyrophosphate

(1) *tribasic-* S orthophosphate Colorless hexagonal crystals, d 1 644, m 77, soluble in water (2) *dibasic*, anhydrous- Sorensen's sodium phosphate, disodium orthophosphate A white hygroscopic powder, soluble in water, used as a reagent, and in buffer solutions (3) *dibasic*, hydrous- Disodium orthophosphate Monohydrogen sodium phosphate Colorless, transparent rhombic crystals d 1 52, m 35 soluble in water insoluble in alcohol or ether, used as a reagent (4) *monobasic-* Monosodium orthophosphate, dihydrogen sodium phosphate, sodium biphosphate Large colorless, transparent, rhombic crystals d 2 04 soluble in water insoluble in alcohol used medicinally (5) *metaphosphate-* Colorless crystals, d 2 476, m 615 slightly soluble in water, used as a reagent Its polymer is $Na_4P_4O_{12}$, calgon, used for water treatment (6) *pyrophosphate-* Colorless monoclinic crystals, d 1 836, m 988, soluble in water, insoluble in alcohol or ether, used as a reagent and in the manufacture of pharmaceuticals (7) *tetraphosphate-* $Na_6P_4O_{13}$ **s phosphide** Na_3P = 100 04 A red solid which evolves phosphine with water, decomp by heat **s phosphites** There are three phosphites Na_3PO_3, Na_2HPO_3 and NaH_2PO_3 The most common is $Na_2HPO_3\,5H_2O$ = 216 2 Colorless rhombohedral crystals, m 53, soluble in water insoluble in alcohol or ether **s phosphomolybdate** $Na_3PO_4\,10MoO_4$ = 1764 0 S molybdophosphate A yellow crystalline powder, soluble in water Used as a reagent for alkaloids and vegetable fats, and in microscopy **s phosphotungstate** $Na_4P_2O_7\,12WO_3\,18H_2O$ = 3374 0 S phosphowolframate A white granular powder, soluble in water Used as a reagent for alkaloids, potassium, ferrous salts and uric acid **s phosphovanadate** $Na_4P_2O_7\cdot 6V_2O_5\,21H_2O$ = 1736 4 A yellow crystalline powder, soluble in water, used as a microscope reagent **s phosphowolframate** S phosphotungstate **s phthalate** $C_6H_4(COONa)_2$ = 210 03 A white powder, slightly soluble in water **s platinichloride** $Na_2PtCl_6,6H_2O$ = 562 1 S platinic chloride A red solid, m 100, soluble in water or alcohol **s platinochloride** Na_2PtCl_4 = 383 04 S platinous chloride A dark brown crystalline solid **s platinocyanide** Platinous sodium cyanide **s plumbate** $Na_2PbO_3\,3H_2O$ = 351 9 A yellow amorphous powder, decomp by water **s potassium carbonate** $NaKCO_3\,6H_2O$ = 230 2 Colorless monoclinic crystals, d 1 6334, soluble in water **s potassium tartrate** Potassium s tartrate **s propionate** $NaC_3H_5O_2$ = 96 04 Et COONa A white granular powder, soluble in water or alcohol **s pyroantimonate** $H_2Na_2Sb_2O_7\,6H_2O$ = 508 5 A colorless powder, slightly soluble in water, alcohol or ether **s pyroborate** See *s borates* **s pyrophosphate** See *s phosphates* **s pyrosulfate** $Na_2S_2O_8$ = 284 2 S disulfate Colorless crystals, soluble in water **s pyrosulfite** $Na_2S_2O_5$ = 190 1 A colorless crystalline powder, soluble in water **s rhodanate** S thiocyanate **s rhodanide** S thiocyanate **s rosolate** $NaC_{20}H_{15}O_3$ = 326 1 S corallinate the sodium salt of trihydroxy-diphenyl-tolylcarbinol A dark-red powder with greenish luster, soluble in water, used as a stain in microscopy **s saccharate** $NaC_{12}H_{21}O_{11}$ = 364 2 A white powder, soluble in water, used medicinally in ampoule medication **s salicylate** $NaC_7H_5O_3$ = 160 1 White scales or crystalline powder, soluble in water, slightly soluble in alcohol or ether Used as a reagent for free acid in gastric juice, and medicinally, as an antirheumatic and antipyretic **s salicylsulfonate** S sulfosalicylate **s santonate** $NaC_{15}H_{19}O_4$ = 286 2 A colorless hygroscopic powder, soluble in water or alcohol, used medicinally as an anthelminthic **s santonate** $NaC_{15}H_{19}O_4\,3\frac{1}{2}H_2O$ = 353 1 Colorless crystals, soluble in water or alcohol Used medicinally as an anthelminthic **s selenate** $Na_2SeO_4\,10H_2O$ = 369 3 White crystals, soluble in water, used as a reagent **s selenite** Na_2SeO_3 = 173 1 A colorless powder, soluble in water, insoluble in alcohol Used as a reagent in bacteriology, and in the manufacture of red glass **s sesquicarbonate** See *sesquicarbonate of soda* **s silicate** *solid-* Na_2SiO_3 = 122 3 S metasilicate Colorless monoclinic crystals, or a white to grayish powder, m 1056, soluble in water and insoluble in alcohol, used similarly to the liquid *liquid-* $Na_2Si_4O_9\,xH_2O$ = 303 2 + 18x Water glass, soluble glass An amorphous powder or thick, heavy liquid aqueous solution, soluble in water,

insoluble in alcohol Used as an adhesive in the paper industry, as binder in acid proof cements, cold water paints, abrasives, as a protective coating on waterproofing cements, concrete, wood, or paper utensils, as a preservative for eggs, in the chemical industry for the manufacture of soap, boiler compounds, paper sizings, road binders, in the textile industry for in bleaching and cleaning fabrics, milk bottles, and greasy glass *tetra-* See *s tetrasilicate* **s silicofluoride** Na_2SiF_6 = 188 3 S fluosilicate, salufer A white granular powder, d 2 73, slightly soluble in water, insoluble in alcohol or ether Used as a reagent antiseptic and germicide **s silver cyanide** S argentocyanide **s silvinate** S sylvate **s sozoiodolate** $C_6H_2I_2(ONa)SO_3H$ = 447 7 Sozoiodolesodium A colorless crystalline powder, soluble in water, alcohol or glycerol, used medicinally as an antiseptic **s stannate** $Na_2SnO_3\,3H_2O$ = 266 7 White hexagonal crystals, soluble in water, insoluble in alcohol or ether used as a mordant in dyeing **s stannite** $HSnOONa$ = 174 71 A compound known only in solution, and analogous to s formate **s stearate** $NaC_{18}H_{35}O_2$ = 306 3 A white, unctuous powder, soluble in water used in pharmaceutical preparations **s succinate** (1) $Na_2C_4H_4O_4$ = 162 2 A colorless powder, soluble in water (2) $Na_2C_4H_4O_4\,6H_2O$ = 270 3 Colorless monoclinic prisms, soluble in water, used medicinally **s sulfalizarate** Alizarin red **s sulfanilate** $NaC_6H_4(NH_2)SO_3\,2H_2O$ = 231 1 S anilinesulfonate s -p-aminebenzene sulfonate Colorless lustrous flakes, soluble in water, used medicinally **s sulfantimonate** $Na_3SbS_4\,9H_2O$ = 479 4 Schlippe's salt, s thioantimonate Large colorless tetrahedral crystals soluble in water decomp by heat, used as a reagent for alkaloids **s sulfates**

(1) Na_2SO_4 = 142 1, normal, anhydrous
(2) $Na_2SO_4\,H_2O$ = 160 1, normal, monohydrate
(3) $Na_2SO_4\,7H_2O$ = 268 2, normal, heptahydrate
(4) $Na_2SO_4\,10H_2O$ = 322 2, normal, decahydrate
(5) $NaHSO_4$ See *s bisulfate*

(1) *anhydrous-* Salt cake, niter cake, native as thenardite A colorless powder, d 2 673, m 884, soluble in water, insoluble in alcohol (2) *monohydrate-* Native as mirabilite A white powder, soluble in water (3) *heptahydrate-* Colorless rhombic or tetragonal crystals, soluble in water and insoluble in alcohol (4) *decahydrate-* Glauber's salt, ordinary sodium sulfate Colorless monoclinic crystals, d 1 462, m 38, soluble in water, insoluble in alcohol, used as a reagent as a precipitant, and medicinally as a cathartic and diuretic **s sulfhydrate** NaHS = 56 0 S hydrosulfide, s hydrosulfate Colorless crystals, soluble in water, used as a reagent **s sulfides** (1) Na_2S = 78 1 Anhydrous s monosulfide An amorphous, slightly pink powder, d 2 471, soluble in water, slightly soluble in alcohol, decomp by heat (2) $Na_2S\,9H_2O$ = 240 3 Colorless hygroscopic crystals, soluble in water Used as a reagent instead of hydrogen sulfide The following polysulfides are also known

(3) Na_2S_2 = 110 1, s disulfide
(4) Na_2S_3 = 142 2, s trisulfide
(5) Na_2S_4 = 174 2, s tetrasulfide
(6) $Na_2S_5(+8H_2O)$ = 206 4, s pentasulfide

s sulfites (1) Na_2SO_3 = 126 1 (*anhydrous* Colorless hexagonal prisms, d 2 633, m 15 decomp by further heat, soluble in water insoluble in alcohol, used as a reagent and reducing agent (2) $Na_2SO_3\,7H_2O$ = 252 (*heptahydrate*) Colorless prismatic crysta m 100 (decomp), soluble in water, insolut in alcohol Used as a reagent, preservative, and medicinally, as an antiseptic and antizymot **s sulfocaffeinate** Symphorol N **s sulf carbolate** S phenolsulfonate **s sulfocabonate** Na_2CS_3 = 154 2 S trithiocarbonat A granular brown powder, soluble in wate used as an insecticide, antiseptic and reage for nickel and cobalt **s sulfocyanate thiocyanate s sulfocyanide** S thiocyanat **s sulfo-oleate** Thigenol **s sulfosalicylat** $NaC_7H_5O_3SO_3$ = 240 0 S salicylsulfonat A white crystalline powder, soluble in wate insoluble in alcohol, used medicinally as antiseptic **s sulfovinate** S ethylsulfate **sulfoxylate formaldehyde** $NaHSO_2CH_2O\,2H_2O$ = 154 11 White rhombic prisms, m very soluble in water, used as a reagent **superoxide** S peroxide **s sylvate** $NaC_{20}H_{29}O_2$ = 324 3 S abietinate, s silvinat A white powder soluble in water or alcoh used medicinally **s tannate** $NaC_{14}H_9O_9$ 344 1 A dark brown powder, soluble in wate **s tartrate** $Na_2C_4H_4O_6\,2H_2O$ = 230 1 Whit trimetric crystals, d 1 794, soluble in wate insoluble in alcohol, used as a reagent an medicinally as a cathartic and refrigerant **taurocholate** (1) $NaC_{26}H_{44}NSO_7$ = 537 5 yellowish-gray powder, soluble in water alcohol, from the bile of carnivorous anima used as a diagnostic reagent (2) The B Codex term for bile salts, q v **s tellurat** $Na_2TeO_4\,5H_2O$ = 327 6 A white powde soluble in water **s tellurite** Na_2TeO_3 221 5 A white powder slightly soluble water, used in bacteriology **s tetraborat** See *s borates* **s tetraiodophenolphthalei** Antinosin **s tetrasilicate** $Na_2Si_4O_9$ = 302 An amorphous colorless solid, soluble in wate **s tetrathionate** $Na_2S_4O_6$ = 270 28 A whi soluble solid **s tetravanadate** S divanadat **s thioantimonate** S sulfantimonate **s thi arsenate** $2Na_3AsS_4,15H_2O$ = 814 74 A so uble solid **s thiocarbonate** Na_2CS_3 154 21 A heavy brown oil It is the sulf analogue of s carbonate **s thiocyanat** $NaSCN$ = 81 1 S sulfocyanate S sulf cyanide, s rhodanate, s rhodanide Whi deliquescent rhombic crystals, m 287, soluble water, used as a reagent, especially for ferr ions **s thiophenesulfonate** $NaC_4H_3O_3S_2\,H_2O$ = 209 1 A white powder, soluble water, used as an antiseptic **s thiosulfat** $Na_2S_2O_3\,5H_2O$ = 248 20 S hyposulfite, subsulfite, antichlor Colorless monoclinic cry tals, d 1 729, m 32–48, decomp 220, soluble water insoluble in alcohol or ether Used as reagent, for volumetric solutions, as a grou precipitant instead of hydrogen sulfide, "antichlor" in paper making and bleachin as mordant, in metallurgy, in photography a fixing salt, and in mining as a solvent for lea and silver, medicinally as a detoxicant for meta lic poisons **s thiotetraphosphate** $Na_6P_4O_{10}S$ = 454 3 A detergent **s thymol ben zoate** Porphyrin **s titanates** $(Na_2O)_2Ti_2O_5$, $Na_2O\,Ti_2O_5$, and $Na_2O\,(Ti_2O_5)_2$

trichloracetate $NaC_2O_2Cl_3$ = 185 4 CCl_3-COONa Colorless crystals, soluble in water **s trichlorophenate** $C_6H_2Cl_3ONa$ = 219 4, Dowicide B A white crystalline powder, soluble in water, used as a mold fungicide, and medicinally as an antiseptic **s trithiocarbonate** S sulfocarbonate **s triticonucleinate** The sodium salt of nucleic acids from wheat A grayish-white powder, soluble in water **s truxillate** $Na_2C_{18}H_{14}O_4\,10H_2O$ = 520 2 A white powder soluble in water **s tungstate** $Na_2WO_4\,2H_2O$ = 330 0 S wolframate Colorless rhombic prisms, in 100 soluble in water Used as a reagent for alkaloids, bile pigments and tannins, and for waterproofing and fireproofing textiles **s uranate** Na_2UO_4 = 348 20 Uranium yellow An orange-yellow rhombic, crystalline powder, soluble in water or acids Used as a reagent, and in the manufacture of green glass, enamels and porcelain pigments **s urate** $Na_2C_5H_2O_3N_4\,H_2O$ = 230 1 A white, granular powder, slightly soluble in water *acid-* $NaHC_5H_2N_4O_3$ = 190 05 A white granular powder, slightly soluble in water **s valerate** $NaC_5H_9O_2$ = 124 1 Colorless crystals, soluble in water or alcohol, used medicinally as a sedative **s vanadate** Na_3VO_4 = 184 2 S *ortho*vanadate A colorless crystalline powder, soluble in water Used as a reagent and in the manufacture of inks and dyes *meta-* See *s metavanadate* **s wolframate** S tungstate **s xanthogenate** $NaS(OC_2H_5)C\,S$ = 144 1 A yellow powder, soluble in water or alcohol, used medicinally as an antiseptic and germicide **s zincate** Na_2ZnO_2 = 143 4 A white amorphous powder, soluble in alkalis, decomp by water into $Zn(OH)_2$ and NaOH

sodos A mixture of sodium dihydrogen phosphate and sodium bicarbonate, used medicinally

sodyl The monovalent NaO—radical **s hydroxide** NaOOH = 56 01 A white powder, which explodes if heated

soft-sized paper Bibulous or blotting paper

softener (1) A substance which when added to another substance increases the plasticity of the latter They are either true s or lubricants, as, stearic acid or pine tar for rubber respectively (2) An agent used in water-softening, q v (3) A substance added to paper or glue to make it more pliable and prevent warping, as diethylene glycol (4) A substance imbibed by cellophane or cotton cellulose making it less brittle, as, glycerol and glycols **anti-** A substance which stiffens, as, benzidine in rubber

softening (1) Making plastic (2) Removing salts **water-** See soft *water, permutite* **s temperature** The transition point at which substances without a sharp melting-point change from viscous flow into plastic flow, as determined by the plastometer

softifume A mixture of NaCN, $NaClO_3$ and sand, which is pressed into bricks and used in fumigation by dropping it into HCl to liberate HCN

sogasoid A dispersed system which consists of a solid phase in a gaseous phase, or solid colloidal particles suspended in air or a gas (as, smoke)

soil The surface layer of the earth, which consists of the weathered mineral and rock fragments of diverse origin, mixed with decaying and decomposed vegetable and animal matter Cf *humus, subsoil* See tables

SOILS

	Lime	*Sand*	*Clay*	
lime poor	0–15	80–100	0	flying sand
			10	loose sand
			20	clay sand
		30–50	30	sandy loam
			40	mild loam
			55	strong loam
		0–30	65	mild clay
			75	common clay
			90	strong clay
	15–20	25–50	20–50	loamy soil
lime rich		0–25	50–75	clayey soil
	15–60	40–80		sandy soil
	50–75	little		calcareous soil
	75–95	little		lime soil

gravel—particles over 2 mm diam
coarse sand— " 0 2 –2 0 mm diam
fine sand— " 0 02 –0 20 mm diam
silt— " 0 002–0 02 mm diam
clay— " below 0 002 mm diam

s amendment A material added to soil to improve its physical or chemical character and productivity other than by the plant nutrients E g , lime added to correct acidity or to promote flocculation of colloidal clay, sand added to prevent hardening of clay **s bacteria** An important group of protophyta that enrich the soil by the ammonification and nitrification of nitrogen compounds *E g , Bacillus mycoides, B proteus vulgaris, B mesentericus, B subtilis, B janthinus, B coli communis, B megatherium, B fluorescens* Cf *azobacter, acetobacter, nitrobacter, nitromonas nitrosomonas, nitrogen cycle* **s science** Pedology The study of the surface layer of the earth

soja Soy bean

sol (1) A colloidal solution (2) The liquid phase of a colloidal solution **aero-** A colloidal system in which the surrounding phase is a gas, *e g* , smoke, fog **collo-** Collosol **electro-** Electrosol **hydro-** A colloidal suspension in which the liquid phase is water (See *gel*) **sulfo-** See *sulfosol*

Solanaceae Nightshade family, a group of herbs or shrubs with rank-scented, often poisonous foliage, and a colorless juice containing alkaloids Cf *solanum*

Roots	
Atropa belladonna	deadly nightshade, atropine
Brunfelsia hopeana	manaca
Mandragora officinalis	mandragorine
Scopola carniolica	scopola
Leaves	
Datura stramonium	thornapple, stramonium
Hyoscyamus niger	henbane, hyoscine, hyoscyamine
Nicotiana tabacum	tobacco, nicotine
Duboisia myoporoides	duboisine
Duboisia hopwoodii	pituri
Branches	
Fabiana imbricata	pichi
Solanum dulcamara	bittersweet, solanin
Fruits	
Capsicum frutescens	cayenne pepper
Lycopersicum esculentum	tomato

s alkaloids The alkaloids obtained from various species of Solanaceae

atropine	$C_{17}N_{23}O_3N$
hyoscyamine	$C_{17}H_{23}O_3N$
hyoscine	$C_{17}H_{21}O_4N$
atroscine	$C_{17}H_{21}O_4N$
atropamine	$C_{17}H_{21}O_2N$
belladonine	$C_{17}H_{21}O_2N$
mandragorine	$C_{15}H_{19}O_2N$
meteloidine	$C_{13}H_{21}O_4N$

Cf *grandiflorine, hypaphorine, lycine, natrine, noratropine, solandrine, solanine*

solandrine An alkaloid derived from *Solandra lævis* It resembles hyoscine

solanellic acid $C_{21}H_{34}O_{12}$ = 502 2 A hexabasic acid formed on oxidation of bile acids

solanidine $C_{27}H_{43}O_3N$ = 397 4 A decomposition-product of solanine Colorless crystals, m 208, soluble in alcohol or ether

solanin $C_{45}H_{73}O_{15}N$ = 867 7 A glycoside from *Solanum nigrum*, potato and other species Colorless, microcrystalline powder, m 280, slightly soluble in water, used medicinally as a nerve sedative

solanine $C_{52}H_{91}O_{18}N$ = 1017 7 An alkaloid in Solanaceae, decomp 254

solanorubin Lycopene

Solanum A genus of herbs and shrubs of the family Solanaceae It includes the nightshades, potatoes, and other species **S carolinense** Solanum, horse nettle poison potato, sand brier, bull nettle The air-dry ripe fruits of S c , a Solanaceae of the Southern States, used medicinally, as the fluid extract, as a sedative **S dulcamara** Bittersweet **S grandiflora** S yielding grandiflorine, q v **S insidiosum** Jurubeba The root of S i , a Solanaceae of Brazil, used medicinally as a stomachic and diuretic **S melongena** The egg-plant of the tropics **S nigrum** The common garden nightshade **S tomatillo** S yielding natrine, q v **S tuberosum** The common potato

solar Pertaining to the sun **s constant** The amount of energy from the sun falling at normal incidence per 1 sq cm per minute, on a body at the earth's mean distance from the sun It equals 1 932 small calories **s evaporation** The concentration of a solution, as sea water, by the sun's heat Cf *evaporator* **s pond** The flat areas surrounded by low dykes in which sea water is evaporated, as in California and Eritrea **s radiation** See *radiation* **s rays** The visible and invisible radiations of the sun **s spectrum** The spectrum produced when sunlight is refracted by a prism or grating It is characterised by the dark Fraunhofer lines (See *spectrum*) **s year** The ordinary year, q v

solargentum A compound of silver and gelatin, black, lustrous granules, used medicinally

solarization (1) Exposure to the sun, as of a photographic plate or the accelerated ageing of rubber and celluloid articles Cf *irradiation* (2) A decrease or complete disappearance of starch following long exposure to light, of plant leaves which previously formed abundant starch

solate A liquefied gel

solation The liquefaction of a gel, the reverse of gelation

solbrol Nipagin

solder Braze A fusing metal or alloy used to unite adjacent surfaces of less fusible metals or alloys **brass-** Copper s **copper-** alloy of 2 parts lead and 5 parts tin, using chloride or resin as flux **fine-** Soft s **fusil** An alloy of lead, tin, and bismuth, which m in water and is also used in fire-spray ex guishers See *Mellot's metal* **gold-** An al of 4 parts copper, 6 parts silver and 10 p gold **hard-** A high melting-point alloy, u as s , it fuses at red heat *E g* , Cu + Zn Ag **lead-** An alloy of equal parts of lead tin, used for soldering lead **plumber's-** alloy usually containing approx Pb 65, Sn 3 with some Sb **silver-** An alloy of silver, and copper **soft-** Any low melting s wh fuses below red heat as Sn + Pb, *lead fusible s* **zinc-** An alloy of 3 parts lead an parts tin

soldering Brazing The act of uniting meta pieces by heat, with or without an alloy (solc and flux (borax) **autogenous-** The union metal surfaces by interfusion, without addition of a more fusible alloy **fusi** The union of metal surfaces by filling intervening space with a completely fu solder **sweating-** S in which the solder heated near its melting point and then adh to the metal surface without being complet fused

Solenhofen stone A fine-grained porous li stone, which contains clay

solenoid Selenoid

solfatara A volcanic vent from which depo of sulfur are obtained

solferino Fuchsin

solid (1) A substance of definite shape, relatively great density, lower internal h content, greater cohesion of its molecu It may be homogeneous (as crystals and s solutions) or heterogeneous (as amorph and colloidal substances) It differs from liquid or gaseous state by reason of its slo molecular motions **s solution** (1) Sosol A completely homogeneous solidified mixtur substances, as, glass (2) A solution of a so liquid, or gas in a solid, which is itself a soli

solidago Golden rod The dried herb *Solidago odora*, a Compositae Used med nally as a diaphoretic stimulant, carminat and diuretic The flower causes a form hay fever

solidify To change into the solid state *heat of solidification*

solidifying point Freezing point

solidus In a temperature-concentration gram where there are both solid and liq solutions, though the concentration of the components are not the same, two curves required for each system, the *s* relates to solid phase and the *liquidus* to the liq phase Cf *diagram*

soliquoid A dispersed system which cons of a solid phase in a liquid phase Solid loidal particles suspended in a liquid, hence suspension

solodization Dealkalization, or the remc of alkali from soils by degradation

solomon's seal Polygonatum The dried h of *Polygonatum officinale*, a Liliaceae, u medicinally as an astringent and antirheuma

solubility The extent to which a substa (solute) mixes with a liquid (the solvent) produce a homogeneous system (solutic The degree of solubility is the concentrat of a saturated solution at a given temperat

Solubility generally increases with an increase in temperature **apparent-** The total amount of substance dissolved in a liquid, comprising the non-ionized and ionized portions **molar-** The relative number of molecules dissolved, m = s/M, where m is *molar solubility*, s the number of grams per liter and M the molecular weight **real-** The amount of non-ionized portion of a solute dissolved in a liquid

s curve A graph obtained by plotting the amount of dissolved substance in a saturated solution against the temperature **s exponent** p or pS The logarithm of the reciprocal of the solubility product, thus, $p_s = \log 1/S$ Cf *pH* **s product** The product of the concentration of ions of a substance in its saturated solution Let MX be a salt that ionises to M^+ and X^-

$$MX \rightleftharpoons M^+ + X^-, \quad \text{then} \quad S = \frac{[M^+] \times [X^-]}{[MX]}$$

If the product of the ion concentration, $[M^+] \times [X^-]$ is smaller than the solubility product, the solution is unsaturated and MX will not precipitate If its exceeds the solubility product, MX will precipitate and in order to cause this it is not necessary to add both ions, as either added M^+ or X^- will shift the equilibrium to the saturation point and cause the precipitation of MX For example, NaCl ionises to Na^+ and Cl^-, and can be precipitated in concentrated solutions by the addition of Cl^- as HCl gas

soluble Capable of mixing with a liquid (dissolving) to form a homogeneous mixture (solution) The degree of solubility may conventionally be expressed

very soluble	less than 1 part solvent
freely soluble	from 1 to 10 parts solvent
soluble	from 10 to 30 parts solvent
sparingly soluble	from 30 to 100 parts solvent
slightly soluble	from 100 to 1000 parts solvent
very slightly soluble	from 1000 to 10,000 parts solvent
insoluble	more than 10,000 parts solvent

needed to dissolve 1 part substance (solute)

Cf *solubility*, *solution* **s barbital** Barbital sodium **s cotton** Nitrocellulose **s glass** Sodium silicate **s gluside** Sodium benzosulfinide **s mercury** $NH_2Hg_2NO_4 = 479\ 6$ Hahnemann's mercury A black precipitate obtained by adding ammonia to mercurous nitrate, used medicinally **s starch** See *starch* **s tartar** Ammonium potassium tartrate **s tartrate** Potassium tartrate

soluend An early term for solute

solurol $C_{30}H_{46}O_{16}N_4\,2P_2O_5 = 1002\ 5$ Thymine acid, nucleotin phosphoric acid A yellow amorphous powder, soluble in water, used medicinally (cf *nucleic acid*)

solute A substance that mixes with or dissolves in a solvent to produce a solution

solution The mixing of a solid, liquid or gaseous substance (solute) with a liquid (the solvent), forming a homogeneous mixture from which the dissolved substance can be recovered by crystallization or other physical processes It is generally not accompanied by chemical change, and is thus strictly a physical phenomenon that may or may not involve ionisation Thus, NaCl = $Na^+ + Cl^-$ occurs in *solution*, whearas, $2Na + 2H_2O = 2NaOH +$ H_2 is a chemical *reaction* **alcoholic-** A solution in which alcohol is the main solvent **anisotonic-** Any non-isotonic solution, as, a hypotonic or hypertonic solution **aqueous-** A solution in which water is the main solvent **buffer-** A solution which consists of acid or basic salts that can neutralize either acids or bases without any appreciable change in hydrogen ion concentration **centinormal-** A solution containing $\frac{1}{100}$ equivalent moles per liter **chemical-** A s in which solute and solvent reaction to form a compound which dissolves in the remainder of the solvent, the latter can not therefore be recovered by distillation Cf *physical-* **colloidal-** A macroscopically-homogeneous, but microscopically-heterogeneous system consisting of minute particles (colloid, dispersed phase) suspended in a liquid (continuous phase, medium) Cf *colloid* **concentrated-** A s in which the solute is relatively great in quantity **decinormal-** A solution which contains $\frac{1}{10}$ equivalent moles per liter **dilute-** A s in which the solute is relatively small in quantity **gram-molecular-** Molar solution **heat of-** See *heat* **hypertonic-** A solution which has an osmotic pressure greater than that of blood serum **hypotonic-** A solution having an osmotic pressure less than that of blood serum **ionic-** A s in which the ions of the solute are surrounded by oriented molecules of the solvent **isotonic-** A solution having an osmotic pressure equal to that of blood serum **molal-** A s containing a gram-molecule (mol) of substance per 1000 gm solution **molar-** A solution containing a gram-molecule of substance per liter It may differ from normal solution **molecular-** A true s in which the molecules of solute are surrounded by the molecules of solvent, Cf *colloidal-*, *ionic-* **normal-** A solution containing one equivalent gram-molecule per liter It may differ from molar solution **normal salt-** A solution containing one mol NaCl per liter It differs from physiological or standard salt solution, q v **physical-** A s in which solute and solvent mix but do not react chemically, the solute can be recovered on evaporation, the solvent by distillation Cf *chemical-* **physiological-** An isotonic solution, as, a solution containing 0 6–0 7 % NaCl **saturated-** A solution that normally contains the maximum amount of substance able to be dissolved **solid-** See *solid-solution*, *sosoloid* **standard-** A solution that contains a definite amount of substance dissolved, as, a molar or normal solution **standardized-** A solution that has been adjusted to a definite, or known concentration, and has definite chemical, physical or therapeutic effects **supersaturated-** A solution that contains a greater quantity of solid than can normally be dissolved at a given temperature, but from which the solid has not separated It is obtained by slowly cooling a saturated solution, and is an unstable system from which the excess readily crystallizes or precipitates **test-** T S A reagent solution **volumetric-** V S A standard solution, usually containing 1, $\frac{1}{2}$, or $\frac{1}{10}$ mol of a substance dissolved in one liter of water, used in volumetric analysis

s pressure The tendency of atoms or molecules to mix with a liquid, or to dissolve in it It is measured by the osmotic pressure and represents the "adhesive" power of the molecusle of the solvent towards the molecules of the

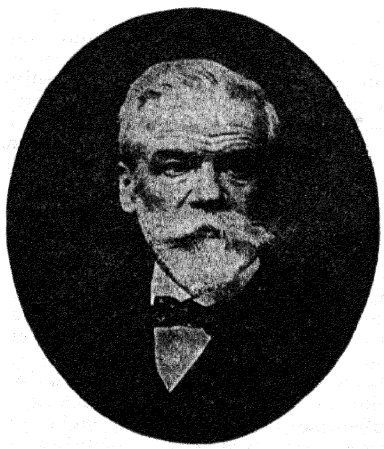
solute. A substance that is capable of forming ions produces the analogous solution tension (q.v.). **s. tension.** The tendency of atoms or molecules to ionize in a liquid, or to dissolve with ionization. It is generally measured by the electromotive force, and represents the power of atoms to hold or lose electrons. See *Nernst's theory.* **s. theory.** See *Nernst's theory, Arrhenius' theory.*

solvate. A molecular or ionic complex formed by one or more molecules or ions of the solvent with one or more molecules or ions of the solute; as, the hydrates $Na(H_2O)_x^+$ and $Cl\text{-}(H_2O)_x^-$, where the ions are surrounded by a zone of oriented water molecules. **crystalline-** A crystal containing solvent as part of its lattice; as, water, alcohol, chloroform, benzene, acetic acid. **s. theory.** The abnormalities of solutions are due to the formation of addition compounds or complexes between the ions or molecules of the dissolved substance and of the solvent. Cf. *zone, hydration, aquation.*

solvation. A combination between solute and solvent; if the latter is water, hydrates or hydrated ions are formed, *e.g.*, $M(H_2O)x$.

solvatochromism. The formation, by molecular addition, of a colored complex (solvate) between colorless molecules of organic compounds and those of other inorganic or organic compounds.

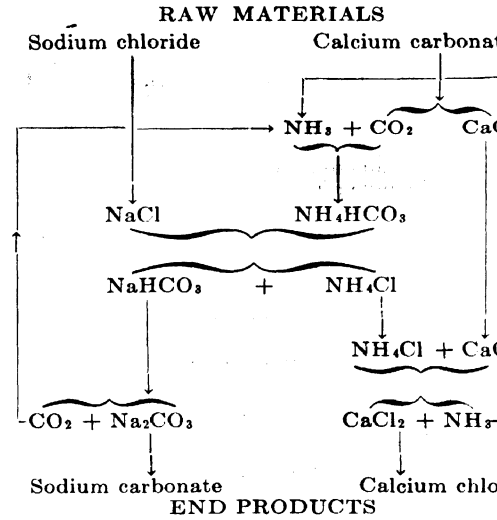
solvatone. A mixture of 80 % acetone, 10 % toluene and 10 % *i*-propylalcohol; used as a lacquer solvent.



Ernst Solvay.

From Brownlee, Fuller and Hancock "Elementary Chemistry." Courtesy of Allyn & Bacon.)

Solvay, Ernst. 1838–1922. A Belgian chemist and industrialist, noted for his development of soda-manufacture. **S. process.** Ammonium soda process. A method of making sodium carbonate by treating sodium chloride with ammonia and carbon dioxide. The sodium bicarbonate produced is heated and some carbon dioxide recovered, while the ammonia is recovered by lime or magnesia. With sodium chloride and the resulting calcium carbonate as raw materials and with a certain quantity of ammonia as circulating medium, the net output is sodium carbonate and calcium chloride, according to the following flow-sheet:



solvent. (1) That component of a homogene mixture which is in excess. (2) A liquid wh dissolves another substance (solute), gener a solid, without any change in chemical c position; as, sugar or salt in water. (3) liquid which reacts chemically with a solid brings it into solution; as, acids which diss metals. See tables. **associating-** A s. wh molecules form complexes; as, water, liq ammonia. Cf. *bond, association.* **aqueo** Water. **chemical-** A substance which re with another to form a solution; as carbonate sulfides which dissolve in acids. **hydrocarb** Gasoline, benzene, kerosene, etc. **ionizing-** *polar-.* **lacquer-** Those organic liquids wh are used to dissolve resins and nitrocellul They are classified as: *low boiling*—b. be 100 (acetone, alcohol, benzene); *medium boil* —b. near 125 (toluene, butyl acetate, a acetate); *high boiling*—b. 150–200 (xyle ethyl acetate, benzyl alcohol); and as *plastici* and *softeners*—b. near 300 (camphor, pht ates, phenyl phosphates). **molten-** Flux. **n associating-** A s. which does not form comple between its molecules or ions and the solute; benzene. **nonaqueous-** A solvent other t water. **nonionizing-** Nonpolar. **nonpolar-** solvent which does not conduct an elec current; as hydrocarbons, chloroform, car disulfide, etc. **normal-** Nonassociating-. **ph ical-** A s. which does not react chemically w the solute. **polar-** A s. which produces e trically-conducting solutions, (as, water, liq ammonia, sulfur dioxide, hydrocyanic a hydrofluoric acid, organic acids and alco and causes dissociation of the solute into i **universal-** Aqua regia.

s. action. Any process of making substan water-soluble; as insoluble phosphates tra formed by soil bacteria to the soluble phosph acid.

ONE-TYPE SOLVENTS

(*a*) Alcohols, R.OH.
methanol, wood alcohol
ethanol, grain alcohol
propanol, propyl alcohol
butanol, butyl alcohol
glycol, ethane-1.2-diol
propan-1.3-diol

glycerol, glycerine
(*b*) Ethers, R O R
dimethylether
ethylmethylether
ethylether, ether
propylmethylether
methylal, dimethoxymethane
glycoldimethylether
(*c*) Ketones, R CO R
acetone, dimethylketone
ethylmethylketone, 2-butanone
diethylketone, 3-pentanone
propylmethylketone, 2-pentanone
acetylacetone, 2 4-pentandione
acetonylacetone, 2 5-hexandione
(*d*) Esters, R COO R
methylacetate
methylpropionate
methylbutyrate
ethylacetate
propylacetate
ethyleneacetate, glycoldiacetate

TWO-TYPE SOLVENTS

(*ab*) Alcohol-ethers, HO R O R
cellosolve, methoxyethanol
ethoxyethanol
diethoxyglycerol
(*ac*) Alcohol-ketones, HO R CO R
acetol acetylcarbinol
acetylpropyl alcohol
diacetone alcohol
(*ad*) Alcohol-esters, HO R COO R
methylglycolate
ethylglycolate
cellosolve acetate
(*bc*) Ether-ketones, R O R CO R
methoxyacetone
ethoxyacetone
diethoxyacetone
(*bd*) Ether-esters, R O R COO R
methylmethoxy acetate
methylethoxy acetate
ethylethoxy lactate
(*cd*) Ketone-esters, R CO R COO R
methyl pyruvate
ethyl pyruvate
methylketo butyrate

solvolysis The effect of the acid or basic character of a solvent on the ionization of a salt dissolved in it

solvolytic Pertaining to solvation **s dissociation** Ionization in a non-aqueous solution, as, liquid ammonia Cf *solvate* theory

solvosal $C_{13}H_{11}O_6P$ = 294 1 C_6H_4 COOPh - O PO(OH)$_2$, salolphosphinic acid A colorless crystalline powder, used medicinally

sombrerite A "hard" mineral phosphate (35 % P_2O_5), a source of phosphorus

Sommerfeld, Arnold A German physicist, noted for his development of the quantum theory of atomic structure **S notation** See *quantum numbers*

somnal $C_7H_{12}NO_3Cl_3$ = 264 49 An ethyl derivative of chloral urethane A clear colorless liquid, used medicinally as a hypnotic and diuretic

somnifacient A hypnotic, or agent that causes sleep

somnifene Allonal

somnirol $C_{32}H_{44}O_7$ = 540 34 A monohydric alcohol of *Withania* species, Solanaceae

somnitol $C_{33}H_{46}O_7$ = 554 43 A dihydric alcohol from *Withania* species, Solanaceae

somnol $C_9H_{11}O_6Cl_9$ = 518 2 Somnos Chlorethanal alcoholate Colorless crystals, used medicinally as a hypnotic

somnos Somnol

soneryl Neonal

sonic Phonic Cf *sound*

Sonnenschein, Franz Leopold 1819–1879 A German pharmacist noted for analytical and forensic methods **S 's reagent** A solution of phosphomolybdic acid It forms a yellow precipitate with the sulfates of alkaloids

sonometer Phonometer An instrument for measuring sound vibrations

sonora gum The exudations of the creosote bush, *Covillea tridentata*, a native of the South Western States and Mexico

soot An impure black carbon containing oily and empyreumatic compounds produced during the incomplete combustion of resinous materials or wood It contains hydrocarbons, and if derived from coal, it has a fertilizing value on account of the presence of ammonium sulfate Cf *lamp-black*

sophol A compound of silver and methylenenucleinic acid, a yellowish powder, used medicinally

sophora Coral bean The poisonous seeds of *Sophora* species, a Leguminosae of India **S tomentosa** A leguminous shrub or tree of the Dutch East Indies and Japan A famous remedy for cholera and diarrhea, it contains an alkaloid, sophorine

sophorin $C_{27}H_{30}O_{16}$ = 610 23 A glucoside from *Sophora* species Cf *cyanin*

sophorine An alkaloid from *Sophora* species A colorless liquid resembling cytisine and matrine Cf *kuhseng*

soporific An agent that produces deep sleep, a hypnotic

sorbic acid $C_6H_8O_2$ = 112 1 Hexadienic acid, pentadiene carboxylic acid, *2 4*-hexadienoic acid* A monobasic acid, Me CH CH CH CH COOH, derived from the unripe berries of mountain ash (*Sorbus*) Colorless needles, m 134 b 228 (decomp) slightly soluble in water, soluble in alcohol or ether **hydro-** Hexenic acid* **methylenedioxyphenyl-** Piperic acid **para-** A lactone-like body that changes when heated with H^+ or OH to sorbic acid

sorbin Sorbinose

sorbinose $C_6H_{12}O_6$ = 180 1 Sorbin, *1 3 4 5 6*-pentahydroxy-*2*-hexanone*, sorbose An optically-active carbohydrate derived from the fruits of mountain ash (*Sorbus*) Colorless rhombic crystals, d 1 654, m 154, slightly soluble in water, alcohol or ether

sorbite (1) Sorbitol (2) A constituent of steel, considered to be a mixture of ferrite and cementite It is a transition-form between pearlite and troostite

sorbitol $C_6H_{14}O_6$ ½H_2O = 191 1 Sorbite, *1 2 - 3 4 5 6*-hexanehexol* An alcohol isomer of mannitol from *Sorbus aucuparia* Colorless crystals, m 111, soluble in water or alcohol

sorbol $C_{34}H_{70}O$ = 494 5 An alcohol, m 78, from the wax of the berries of *Sorbus aucuparia*

sorbose Sorbinose

sorbus Rowan tree, mountain ash The tree *Pyrus* (*Sorbus* or *Mespilus*) *aucuparia*, a Rosaceae Its ripe berries furnish an acidulous and astringent gargle, its unripe berries yield sorbic acid A decoction of the bark is used for diarrhea, and contains sorbitol and sorbinose

Sorel, cement $MgO\,MgCl_2\,11H_2O$ A hard, quick-setting mixture of MgO and a conc solution of $MgCl_2$ **S dental cement** A mixture of ZnO, $ZnCl_2$ and fine sand **S floor cement** A mixture of MgO, $MgCl_2$ and Portland cement used for hard, smooth, dustless floors in office buildings The addition of 10 % finely-powdered copper makes it waterproof

Sórensen, S P L 1868–1939 A Danish chemist noted for the preparation of pure salts, aminoacids and enzymes **S indicators** A group of indicators, used to determine the hydrogen-ion concentration See *indicators* **S phosphate** Dibasic sodium phosphate **S symbols** See P_H **S value** Hydrogen-ion concentration

Soret's effect, S 's principle Ludwig phenomenon When differences of temperature are maintained in a salt-solution, the dissolved material will concentrate in the coolest portions of the liquid

sorghum A cane-like grass, *Andropogon sorghum*, from which a sugar and syrup is obtained

soricin A purified sodium ricinoleate, made from castor oil and used as detoxifying agent against snake and copra venom, and tetanus and diphtheria toxins

sorption A reaction occurring on a surface, such as, hydrolysis, electrification and especially *absorption* (q v) or solution, *adsorption* (q v) (strictly confined to a surface, as between liquid and solid), *persorption* (permeation into a very porous solid) Cf *monomolecular film*, *orientation*, *desorption* **ab-** See *absorption* **ad-** See *adsorption* **re-** See *resorption* Cf *zone*

sorrel The leaves of *Rumex acetosa*, a Polygonaceae, used as refrigerant and diuretic **s salt** Potassium bioxalate

sosoloid Solid solution A dispersed system consisting of a solid phase dispersed in another solid phase See *colloidal systems*

Soubeiran, Eugène 1797–1858 A French apothecary noted as discoverer of chloroform and as a writer

sound (1) Those air-oscillations or vibrations which affect the ear and are rendered audible Cf *musical notes* (2) The vibrations in air or other medium which may or may not be audible, as, *infraphonic* (longer frequency than audible s), *phonic* (audible), *ultraphonic* (shorter frequency than audible s) (3) Free from defect, as s steel, which is free from blowholes **s intensity** The actual energy content of s waves as measured by electrical instruments **s loudness** The magnitude of s as measured by the human ear, it is related to intensity as follows

Loudness	*Intensity*
10 decibels =	10
20 decibels =	100
30 decibels =	1,000
40 decibels =	10,000
50 decibels =	100,000
60 decibels =	1,000,000
70 decibels =	10 000 000

Cf *phon*, *loudness* **s velocity** The speed with which s vibrations travel in materials

in air	331 9 m per sec
in water	1460 m per sec
in wood	4200 m per sec
in iron	5000 m per sec

s waves Phonic waves Mechanical ra tions consisting of air vibrations Cf *so* (*2*), *noise*, *decibel* The *highest audible* s h wave-length of 17 mm , the *lowest audibl* 16 m

sourwood The leaves of *Oxydendrum arbore* a small tree of North America, used medicin as the fluid extract

southern wood *Abrotanum*

sovprene A polymerized chloroprene, q v

Soxhlet, Franz 1848–1913 A German chemist, noted for his methods of food analysis **S apparatus** A flask and condenser for the continuous extraction of fats or other alcohol-soluble or ether-soluble materials (see illustration)

Soxhl apparc

soy S bean **s bean** Soja, soya The bean of *Soja hispida*, a Leguminosae of China It is an important native food and the source of many preparations, as, flour, sizing materials, bean cake, sauce, cheese, etc It contains protein, starch, alkaloids and urease **s bean oil** A colorless oily liquid expressed from s D $_{15}$°0 925, free fatty acids (as oleic acid) 0 46 %, sapon val 191 1, iodine val 129 2, used in cooking

soya Soy bean

sozal $Al_2[C_6H_4(OH)SO_3]_6 = 1093\ 4$ Aluminum-p-phenolsulfonate, aluminum sulfocarbolate A brown crystalline powder, soluble in water or alcohol, used medicinally as an iodoform substitute and antiseptic

sozalbumin A non-toxic defensive prot Antonym toxalbumin

sozins Defensive proteins which occur norm in the body Antonym, toxosozins

soziodol Sozoiodol

sozoiodol $C_6H_4O_4I_2S = 425\ 94$ Sozoiod acid, soziodol, diiodo-p-phenolsulfonic a $C_6H_2I_2OH\,SO_3H$ A white lustrous, crysta powder decomp 200, soluble in water l medicinally as an antiseptic and iodof substitute

sozoiodolate A salt of sozoiodol Those of Hg, K, Na, and Zn are used medicinally antiseptics

sozoiodolic acid Sozoiodol

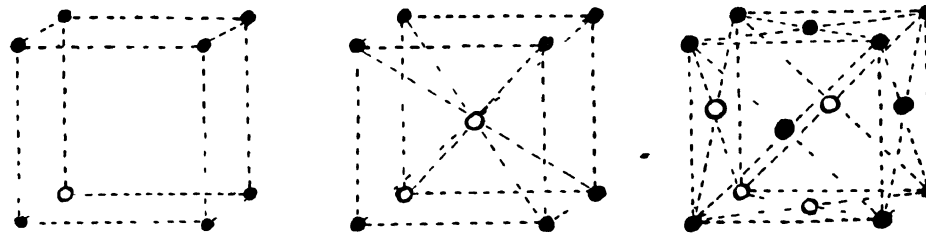
sozolic acid Aseptol

Sp An abbreviation for spirit

Sp Gr An abbreviation for specific gravity

space The three-dimensional concept of len width, and height L^3, where L is any uni length **Crookes'-** Dark s **dark-** A luminous region near the cathode of a vac tube, through which a high-frequency cur is passing **interatomic-** The region betv the outermost orbits of two atoms in **atomic-** The area within the outermost of an electron and the nucleus of an atom consists of the kernel (q v) and the orbit the valence electrons

s group One of the characteristic s lattices or arrangements of atoms in a cry **s lattice** The pattern formed by the sp distribution of atoms or radicals in a cry q v See figure



Cubic Body-centered Face-centered

Space lattice

spalling (1) The failure of a refractory material to withstand stresses induced by temperature fluctuations without rupture (2) Of metals The cracking or flaking off of particles from a surface (*e g*, wheels and rails) (3) In general The splintering, cracking or breaking up of materials due to heat (*e g* ceramics)

span A unit of length in the English system It equals 9 inches, half a cubit or 22 86005 cm

Spanish broom Spartium **S flies** Cantharides **S hops** Origanum **S moss** Vegetable *horsehair*

spar Any transparent or translucent readily cleavable, crystalline mineral having a vitreous luster, as, calcspar, feldspar fluorspar, heavy spar

sparassol $C_{10}H_{12}O_4$ = 196 09 Methyl everninate, $C_6H_2(COOMe)Me(OMe)OH$ -*1 2 4 6* An ester and ether from the oil of *Sparassis ramona*, a lichen Colorless powder, m 68 Cf *lichenol*

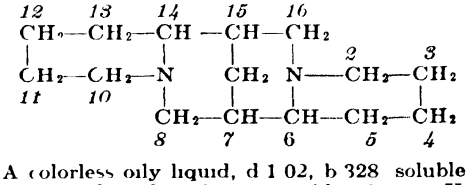
spark A flash of light produced chemically or physically, as on burning iron wire in oxygen, or passing an electric discharge through air It differs from an arc since it depends on the ionization of the medium through which it passes **s spectrum** An emission spectrum characteristic of the electrode metal, obtained by refracting the flashes passing between metallic electrodes carrying a high-tension discharge It is used in analysis and is characterized by the enhanced lines due to ionized atoms It differs from the arc spectrum (produced by neutral atoms), and resembles in general the arc spectrum of the element of next smallest atomic number Cf *isostere*

sparking Producing electric sparks Cf *arcing* **s potential** The electric potential necessary to produce a spark in vapor or gas at ordinary temperature It depends on the distance apart, shape and size of the electrodes

sparklet A powder (similar to baking powder) for the generation of small quantities of carbon dioxide in the laboratory

spartalite Native zinc oxide

sparteine $C_{15}H_{26}N_2$ = 234 2 Lupinidine An alkaloid obtained from *Spartium scoparium* or broom Cf *scoparius*



A colorless oily liquid, d 1 02, b 328 soluble in water, alcohol, ether, or chloroform Used medicinally as a heart stimulant Cf *cytisine*, *anagyrine* **s bisulfate** Sparteine sulfate **s hydriodide** $C_{15}H_{26}N_2(HI)_2$ = 490 09 Colorless needles, soluble in water or alcohol **s hydrochloride** $C_{15}H_{26}N_2(HCl)_2$ = 307 17 Colorless crystals, soluble in water or alcohol **s sulfate** $C_{15}H_{26}N_2\,H_2SO_4\,5H_2O$ = 422 40 Sparteine bisulfate Colorless, deliquescent crystals, m 136, soluble in water, alcohol or ether, used medicinally as a cardiac tonic and diuretic

spartium (1) Scoparius (2) The fiber from *S junceum*, Spanish broom, a Leguminosae Cf *esparto* **s alkaloids** A group of alkaloids derived from scoparius

sparteine	$C_{15}H_{26}N_2$
spartyrine	$C_{15}H_{24}N_2$
oxysparteine	$C_{15}H_{26}ON_2$
dioxysparteine	$C_{15}H_{26}O_2N_2$
trioxysparteine	$C_{15}H_{26}O_3N_2$

spasmotin $C_{26}H_{41}O_9$ = 405 2 Sphacelotoxin A poisonous principle from ergot A yellow amorphous powder, soluble in alcohol or ether

spasmotoxin A ptomaine from cultures of tetanus bacillus

spathic Describing a lamellar or foliated structure **s iron ore** Siderite

spatial Pertaining to space

spatula A blunt knife used for mixing semi-solid masses, or to transfer small quantities of powders in weighing

spearmint Mentha viridis The dried leaves of *Mentha spicata* a Labiatae Used as the fluid extract, as a carminative and flavoring agent **s oil** Oleum menthae viridis The volatile oil distilled from the fresh overground portions of the flowering plant *Mentha spicata* Colorless oil, d 0 917–0 934, soluble in alcohol, it contains carvone, linalol, pinene, etc

spear pyrites Marcasite

species (1) A subdivision of a genus of plants or animals (2) The Latin term for a tea (3) A type, as, atomic s **aromatic-** A mixture of thyme, peppermint, lavender and cloves **laxative-** St Germain tea A mixture of senna, elder flowers, fennel, anise, and potassium bitartrate **pectoral-** Breast tea A mixture of althaea, coltsfoot, licorice, anise, mullein and orris

specific Pertaining to a single kind of matter microorganism, plant, animal, or to any particular thing **s charge** The ratio e/m_0 = 1 760 × 10^7 e m u /g = 5 276 × 10^{17} e s u /g **s conductivity** See *conductivity* **s conductance** L The reciprocal of the resistance, R, of a centimeter cube of a substance, L = 1/R **s energy** See *energy* **s gravity** The ratio of the density of a substance to the density of another substance chosen as standard, *i e*,

$$\text{Sp Gr} = \frac{\text{weight of substance}}{\text{weight of equal volume of standard}},$$

(weighed under the same conditions) In the case of solids and liquids the standard is usually water, and in metric units it is equal to the density (grams per cubic centimeter) In the case of gases the standards are oxygen, hydrogen or air, and they can be calculated from the molecular weight for ideal gases (see *equation of state*)

$D_{(O_2=1)}$ = Molecular weight = M
$D_{(H_2=1)}$ = Molecular weight divided by 2
$D_{(air=1)}$ = Molecular weight divided by 28 95

See *hydrometers* **s heat** The number of calories required to raise the temperature of one gram of material by one degree centigrade **s inductive capacity** Di-electric constant **s magnetization** The susceptibility to a magnetic field, $\chi = I/Hd$, I is the quantity of magnetization, H the intensity of the magnetic field, d the density of the material **s reaction rate** The constant, k, or rate of reaction at unit concentration (1 mol per liter) **s refraction** Refractivity The degree of deviation of light caused by an element or compound It is the ratio (1) $\frac{n-1}{d}$, or (2) $\frac{n^2-1}{n^2-2}\frac{1}{d}$, n is the refractive index, and d the density of the substance **s resistance** Resistivity The number of ohms of resistance offered at a particular temperature by one cubic centimeter of material Conductivity (q v) is the reciprocal of resistance S r is expressed by the factor of proportion, $\rho = Ra/l$, where R is the resistance in ohms, a the area of a cross section and l the length of the body, ρ is expressed in ohm-cm , 1 ohm-cm = 0 3937 ohm-inch **s rotation** The angle of rotation α produced by one cubic centimeter of material at standard temperature with sodium light $[\alpha]^t_D = \frac{rv}{nl}$ where $[\alpha]^t_D$ is the s rotation at t°C for the sodium line D, r, the observed rotation in angular degrees, v the number of cc , n the number of grams dissolved, and l, the length of the tube in cm See *polariscope, rotation* **s rotatory power** The rotation (in angular degrees) produced by a solution containing one gram of substance for each cc of liquid and examined in a column 10 cm long, usually with the yellow sodium flame (D-line of spectrum) and at room temperature (20°C), hence $[\alpha] = \frac{100a}{lc}$, where $[\alpha]$ is the s r , a the observed angle, l the length of the column in decimeters, and c the concentration (g per 100 cc) **s surface** The ratio of the area A, per unit volume V, of a colloidal system sp s = A/V **s volume** The volume occupied by one gram of material It is the reciprocal of density sp vol = 1/d **s weight** Specific gravity

specifics A small group of remedies that are exceptionally definite and uniform in their action towards certain diseases, as, quinine for malaria or mercury for syphilis, germanin for sleeping sickness magnesium sulfate for tetanus, emetine for amebic dysentery, amyl nitrite for angina pectoris

specpure Spectroscopically pure, *e g* , applied to a substance giving a pure spectrum, characteristic of itself only

spectra Plural of spectrum, q v Classification

A The SOURCE of the light—

solar s	flame s	vacuum spark s
stellar s	flash s	vacuum flash s
arc s	explosion s	x-ray s
spark s	vacuum arc s	

B The KIND of spectrum produced—

emission s or absorption s { continuous s (*a hot solid body*); discontinuous s { line s (*atoms*); band s (*molecules*) }

C The MODE of production—

prism-refracted s	grating diffracted s
grating-refracted s	primary,
primary,	secondary,
secondary,	etc
etc	crystal diffracted s

spectral Pertaining to a spectrum **s analysis** See *spectrum analysis* **s classification** S types Harvard Star classification A systematic arrangement of the stellar spectra in a continuous sequence of types, which ranges from bright line spectra to diffused band spectra Of all the stars examined 99 % fall into the classes B, A, F, G K, M, and N, which are characterized by the following predominant lines

B—hydrogen and helium lines
A—hydrogen lines
F—hydrogen lines and faint metallic lines
G—many metallic lines, but no compounds
K—strong metallic lines, very weak bands
M—banded spectra of metallic oxides

This, however, does not indicate completely the chemical nature, but rather the physical conditions of a celestial object Cf *transuranium, hypon* The stars of each class show many similarities of temperature, brightness and size, which lead to conclusions as to their equality of mass and internal conditions See table of star s classes **s tube** An evacuated glass tube with two electrodes By filling the glass tube with a gas before evacuation, the remaining,

Spectral tube

rarefied traces of gas produce light with a characteristic spectrum when an electric current is passed through **s types** (1) S classification (2) See spectra

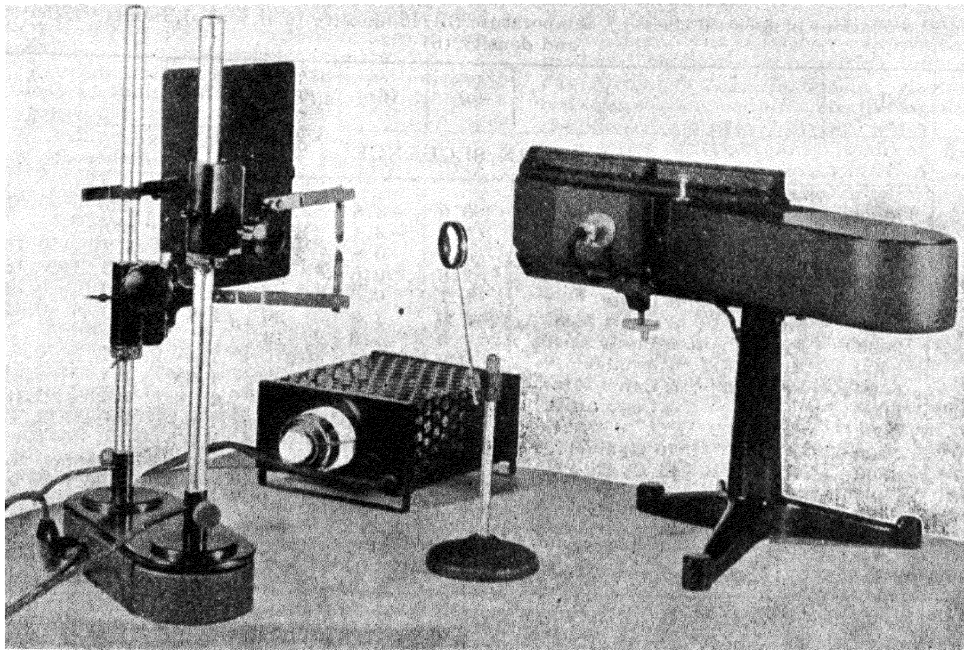
spectrochemical analysis Spectroscopic analysis

spectrochemistry A branch of science that utilizes light waves as a means of chemical analysis (see *spectrum analysis*)

spectrogram The photographic plate, film or print on which a spectrum is recorded, together with a standard comparison spectrum

spectrograph An instrument to produce a spectrogram, consisting of (1) the slit, (2) the lenses (collimeter or camera lens), (3) the dispersing system (prisms or gratings), (4) the recording system (photographic, thermal or ionic) See illustration **quartz-** A s used for wave-lengths of 8000–2000 A U **x-ray-** A device for obtaining crystallograms

spectroheliograph A device for photographing the sun's surface by means of a spectroscope employing a specific line of the spectrum, the slit of a camera is focused on the desired portion



Spectrograph.
1. Arc and spark stand; 2. Rheostat; 3. Condensing lens; 4. Littrow spectrograph. (*Bausch and Lomb.*)

of the solar spectrum, and a picture of the distribution of certain element vapors is obtained.

spectrometer. A spectroscope with scales for measuring the angle of refraction and the wavelengths of lines or bands. **constant deviation-** A s. in which the collimator and telescope are fixed permanently at right angles, and the prism is rotated.

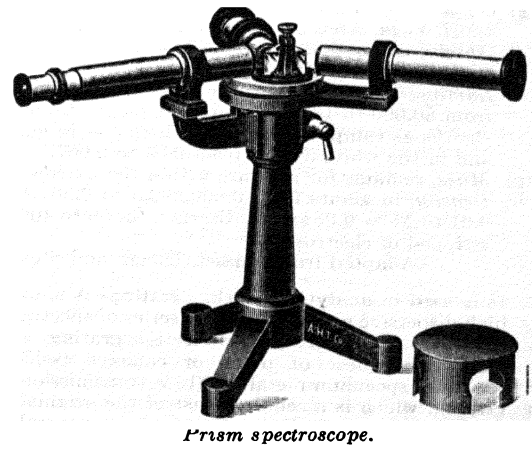
spectrometry. The measurement of the wavelengths of the lines or bands in a spectrum and their identification with the elements which produce them.

spectrophotometer. (1) A device for measuring photometrically the quantity of light of any particular wave-length range absorbed by a colored solution. (2) A device for measuring the intensity of the photographic image of a spectral line.

spectroscope. (1) An instrument for analyzing light by separating it into its component rays. It consists essentially either of a prism that refracts the light, or a grating by which the light is diffracted, together with a device for making the rays parallel (collimator) and an eyepiece for enlarging the spectrum (view telescope). (2) A device by which radiations are separated into component parts; as, mass s., x-ray s. S. are classified in terms of:

(1) Slit:
present..... general work
absent..... astronomical work
(2) Lens system (collimator):
quartz..... for ultra-violet
crown glass..... for low dispersion
flint glass..... for high dispersion
fluorite, sylvine and rock salt..... for infra-red
(3) Dispersing system:
prisms (made of material as under 2)
plane grating
concave grating
(4) Observing and recording system:
eyepiece..... visual (spectroscope)
photographic plate..... spectrograph
thermopile..... } energy
photoelectric cell..... } measurements

abridged- An absorptiometer (q.v.) used with a series of restricted spectral ranges. **comparison-** A s. for comparing two spectra, side by side. **direct vision-** A s. of low-dispersive power in which the collimator, train of prisms and eyepiece are along the axis of a single tube.



Prism spectroscope.

SPECTRAL CLASSIFICATION OF STARS

Showing the relations of spectral class (a), temperature (b), luminosity (c, d, and e), radius (f), mass (g) and density (h)

(a)	(b)		(c)	(d)	(e)	(f)	(g)	(h)
		MAIN SEQUENCE						
B1	21000°C	**β Centauri**	0 9	−3 8	3100	11	(25)	0 018
B2	20000	Spica **α Virginis**	1 2	−3 1	1500		(20)	
B3	17000	**ν Scorpii**	4 3	−0 8		3 2	(5 2)	0 16
A0	11200	**β Aurigae**	2 8	0 6	50	2 4	2 2	0 18
A0	11200	Vega **α Lyrae**	0 1	0 6	50	2 4	3 0	0 11
A0	11200	Sirius **α Canis Maj A**	−1 6	1 3	26	1 8	2 3	0 42
A3	9000	Formalhaut **α Piscis Austr**	1 3	2 0	13			
A5	8600	Altair **α Aquilae**	0 9	2 5	9 2	1 4	1 7	0 6
dF5	6500	Procyon **α Canis Min**	0 5	3 0	5 4	1 9	1 1	0 16
dG0	6000	**α Centauri A**	0 3	4 7	1 1	1 1	1 1	1 1
dG0	6000	SUN	−26 7	5 0	1 00	1 00	1 00	1 42
dK0	5100	**70 Ophiuchi A**	4 3	5 7	0 21	1 0	0 9	0 9
dK7	3800	**61 Cygni A**	5 0	8 4	0 04	0 7	0 45	1 3
dM3	3300	Krüger 60 A	9 2	11 2	0 003	0 34	0 26	9 0
dM4	3100	Bernard's star	9 7	13 4	0 001	0 16	0 18	45
		GIANTS AND DWARFS						
		(giants)						
gG0	5500	Capella **α Aurigae A**	0 9	−0 1	150	12	4 2	0 0024
gK0	4100	Arcturus **α Bootis**	0 2	−0 3	100	30	(8)	0 0003
gK5	3300	Aldebaran **α Tauri**	1 1	−0 1	90	60	(4)	2×10^{-5}
gM5	2900	**β Pegasi**	2 6	−1 4	600	170	(9)	2×10^{-6}
		(super-giants)						
cM5	3100	Betelgeux **α Orionis**	0 9	−2 9	1200	280	(15)	6×10^{-7}
cM0	3100	Antares **α Scorpii A**	1 2	−4 0	3400	480	(30)	3×10^{-7}
cB8		Rigel **β Orionis**	0 34	−5 8	18000			
cF0		Canopus **α Carinae**	−0 8	−7 4	80000			
		(white dwarfs)						
F	7500	Companion to Sirius	8 4	11 2	0 003	0 034	0 96	27000
A0	11000	40 Eridani B	9 7	11 2	0 003	0 019	0 44	64000
F	7500	van Maanen's star	12 6	14 5		0 007	(0 14)	400000

(a) *Spectral Class* (d—dwarfs, g—giants, c—super-giants)

(b) *Surface Temperature*, decreases gradually from 21,000°C in class B to 3000°C in class M

(c) *Apparent* or *Visual Magnitude* as seen from the earth Brightest stars are Sirius, Canopus α Centauri, Vega, Arcturus (A standard candle at 1 m distance has −14 2, at 1 km distance 0 8)

(d) *Absolute Magnitude*, corrected for distance −7 4 (Canopus) the brightest, and 14 5 (van Maanen's star) the faintest star on this list

(e) *Luminosity*, the reciprocal of absolute magnitude Compared to the Sun = 1, it ranges in giants from 80,000 to 10, in the main sequence from B = 3100 to M = 0 001

(f) *Radius* as compared to Sun = 1, ranges in giants from 480 to 12, in main sequence from 11 to 0 1, and in the white dwarfs from 0 03 to 0 007

(g) *Mass*, remains for all stars within the narrow range of $\frac{1}{10}$ to 30 times the mass of the sun

(h) *Density* in giants from 0 000,000,3 to 0 002,4 (highly-rarified gases), in main sequence from B = 0 01 to M = 9 0, and in dwarfs from 50 to 400,000 times the density of water (closely-packed atoms stripped of electrons)

(Adapted from Russel, Dugan and Stewart, "Astrophysics," Ginn and Co , 1927)

It is used in analytical work **grating-** A s of high dispersive power in which a series of spectra is formed by either (a) a reflection grating, a finely-ruled piece of plane or concave (self-focusing) speculum metal, or (b) a transmission grating, which is a celluloid cast of the original grating **mass-** A device for separating canal rays or positively-charged corpuscles by subjecting them to electric and magnetic fields Cf *isotopes*, *mass spectra* **measuring-** A s adapted to the measurement of the wave-lengths of the component rays, a *spectrometer* **micro-** See *microspectroscope* **photographic-** A s in which the viewing telescope is replaced by a camera, a *spectrograph* **prism-** A s of low or high dispersive power containing a single prism or a train of prisms, either of glass, quartz, rock salt or other transparent material **reversion-** A s which enables the same spectrum to be reproduced twice, but in reverse directions, thus doubling any displacement of absorption bands, used for the determination of CO in blood **x-ray** See *x-ray spectrometer*

spectroscopic Associated with the spectroscope **s analysis** Spectrum analysis, spectrochemical analysis The qualitative and quantitative

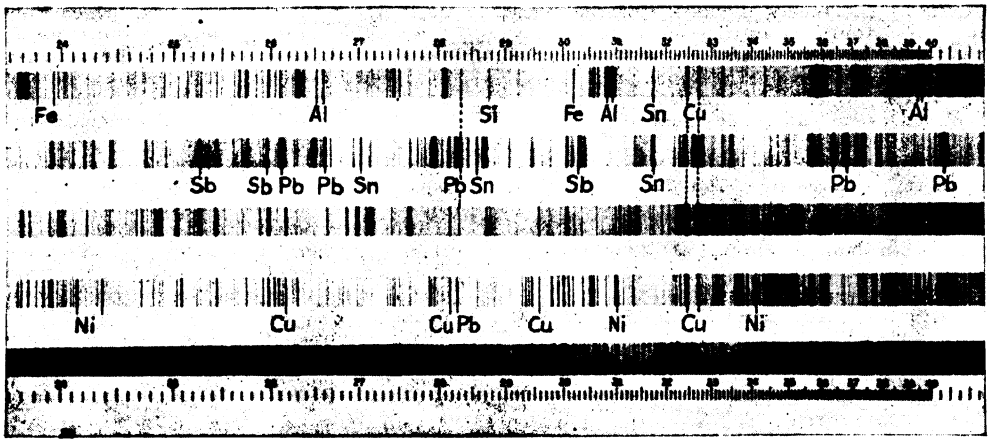
analysis of substances by means of the spectroscope. Minute quantities of elements may be detected by their characteristic lines in the spectrum. The principal methods are:

1. Examination of a flame (bunsen burner) colored with a small quantity of the substance:
   sodium, yellow line 589
   potassium, red lines 766, 769, purple line 404
   lithium, red line 671
   cesium, blue lines 455, 459
   rubidium, purple lines, 420, 421
   calcium, orange band 620–618
   strontium, red bands, 686–674–662 and 606
   barium, green line 553, bands 534–524, etc.
   radium, red band 670–653
   thallium, green line 535
   indium, blue line, 451, purple line 410
   copper, green and blue lines and bands
2. Examination of an electric spark passing through a small cup containing a solution of the substance; for: magnesium, iron, manganese, zinc, cobalt, nickel, chromium.
3. Examination of the spectrum when the light has previously passed through a solution of the substance (absorption spectrum). This method is used extensively in the investigation of organic substances, including blood and coloring materials.

spectroscopically. Pertaining to spectroscopy. **s. pure.** Specpure. The degree of purity of a substance which enables it to be identified spectroscopically, the essential lines being apparent without interference from those due to the impurities present.

spectroscopy. That branch of science which investigates the properties of light by means of the spectroscope.

spectrum. (1) A variously-colored band of light showing in succession the rainbow colors or isolated lines or bands of colors; produced by refraction through a prism, or by diffraction by a grating. It may be of the emission type (flame, arc, spark), or the absorption type. Cf. *spectra.* (2) A similar band of radiant energy, invisible to the eye and extending beyond the violet (ultra-violet) or red (infra-red) portions of the visible spectrum. See *radiations.* **absorption-** The visible or invisible s. produced by a composite ray of light after it has passed through a colored solution or through a layer of vapor or gas, which absorbs one or more constituent ray. **arc-** A s. produced with an electric arc as source of light. The element or compound is placed between the carbon poles of an arc. **Aston-** See *mass-.* **band-** A s. consisting of a series of lines so close together that they appear as a continuous band. They are due to *molecular* vibrations. Cf. *line s.* **bright line-** See *line-, flash-.* **chemic-** That portion of the s. which contains the most chemically-active wave-lengths, as actinic or ultra-violet rays. **comparison-** A s. which contains a number of sharp lines; whose wave-lengths serve as standard; it is usually photographed on the same plate above and below the spectrum to be examined or measured. The arc or spark spectrum of titanium or iron is often used. **continuous-** A s. in which no Fraunhofer lines are visible; that is, in which there is an uninterrupted change from one color to another. **dark line-** Reversal s. A s. which contains Fraunhofer lines, or some portions less bright than others, cf. *absorption-.* **diffraction-** A s. produced by means of a grating. **discontinuous-** A combined line and band s. **electrochemical-** See *electrochemical-.* **electromagnetic-** See *radiations.* **emission-** A s. which consists of a series of bright lines produced from an incandescent source. **explosion-** A s. produced by exploding a metallic wire or a solution on an asbestos fiber by means of an electric current. It shows lines from excitation states above the spark s. **flame-** A s. produced with a bunsen flame as the source of excitation. **flash-** (1) Explosion-. (2) A s. showing bright Fraunhofer lines on a dark background; it is seen during a solar eclipse and originates in the hot gases surrounding the sun, which ordinarily absorb and give rise to the dark Fraunhofer lines. **furnace-** A s. obtained with an electric furnace (3000°C.) as source of excitation. It is intermediate between the flame and arc s. **high frequency-** An x-ray s. produced by high-frequency currents. **hyperfine-** A s. consisting of extremely thin lines close together, and due to nuclear vibrations. Cf. *band s.* **infrared-** The dark region beyond the red end of the s.; it consists chiefly of thermal rays. **line-** A s. that shows colored or bright lines on a dark back-ground; due to atomic vibrations. Cf. *hyperfine s.* **invisible-** See *ultra-violet s., infra-red s.* **magnetic-** See *magnetic s.* **mass-** Aston-. The series of images produced on the photographic plate when canal rays are subjected to electric and magnetic fields, which separate the ions according to their mass. Cf. *isotopic weight.* **molecular-** See *band s., molecular ray.* **Moseley-** See *x-ray spectrum.* **nebular-** S. obtained by photographing gaseous, planetary or spiral nebulae with telescope and spectrograph. **normal-** Diffraction s. A s. produced by a grating; it shows the rays of different wave-lengths in proper relationship to one another, and is not as distorted as is the s. produced by a prism, which crowds the blue and violet lines together. **photographic-** S. that affect photographic emulsions. Cf. *ionic, thermal.* **photopic-** A s. bright enough to arouse color sensations in the human eye. Cf. *scotopic s.* **planetary-** A polarized solar s., produced by light reflected from planets. **primary-** The most prominent s. produced by a grating. **Raman-** See *scattering, Raman spectrum.* **reversal-** See *dark line-.* **Roentgen-.** X-ray-. **scotopic-** The s. seen by the dark-adapted human eye. Cf. *photopic s.* **secondary-** The second most prominent s. produced by a grating. **solar-** A s. produced by the light of the sun; it shows the characteristic Fraunhofer lines. **spark-** A s. produced by the excitation of a vapor by electric sparks. By using electrodes of different metals a characteristic spectrum with many enhanced lines for each metal is obtained. **stellar-** A s. produced by the light of stars. Cf. *spectral classification.* **sun-spot-** A s. obtained by passing the light from sun spots through a quarter-wave plate or Nicol prism; it shows the Zeeman effect, q.v. **ultra-violet-** The dark portion beyond the violet end of the s.; it consists chiefly of chemically-active rays. Cf. *irradiation.* **x-ray-** Moseley s. A series of lines characteristic of the metal used as anticathode in an x-ray tube. The



Spectra of metals and alloys.

1. Aluminum casting. 2. Babbitt metal. 3. Electrolytic copper. 4. Monel metal. 5. Iron spark

x-rays are diffracted by a crystal acting as a grating, and the rays are photographed. The frequencies are proportional to the atomic number of the element used as anticathode; they originate in the transitions of electrons from one energy level to another. Cf. *K, L, M radiations, Bohr atoms, orbit.*

s. analysis. (1) The measurement of the intensity and frequency of s. lines. (2) Spectroscopic analysis. (3) The analysis of the structure of a spectrum, *e.g.*, the resolution of it into series or multiplets. **s. classes.** See (1) *spectra*, (2) *spectral classification*. **s. lamp.** See *lamp*. **s. lines.** See *s. series*. **s. series.** A mathematical relationship existing between the lines or group of lines in the spectrum of an element.

$$\nu = \frac{1}{\lambda} = L + \frac{BN}{\left(m + \alpha + \frac{\beta}{m^2}\right)^2}$$

ν = the wave number in vacuo (waves per cm.);
L = the wave number of the limit of the series;
N = the Rydberg universal series constant, (109678.7 for H_2);
m = a variable integer corresponding with a definite line,
α, β, B = constants.
Cf. *Rydberg, Bohr's theory, orbits.* **s. types.** The appearance of a s., as in spectral classification. Laboratory s. are generally either:

A. Continuous; as, from an incandescent lamp, carbon arc or hot glowing body
B. Discontinuous:
   1. *bright line* s.; as incandescent gas, flame of sodium, arc of iron or spark spectra.
   2. *dark line* s.; as solar spectrum or continuous spectrum absorbed by a hot gaseous envelope.
   3. *bright band* s.: as comet spectrum.
   4. *dark band* s.: as, the absorption spectrum of hemoglobin or dye solutions.

specular. Mirror-like. **s. coal.** Pitch coal. A shining variety of coal. **s. hematite.** Specularite. **s. iron.** Specularite. **s. metal.** Speculum metal.

specularite. Fe_2O_3. Specular hematite, specular iron, gray hematite. A native iron oxide; disk-like crystals with bright metallic luster.

speculation. A guess or a conclusion drawn from incomplete knowledge of facts. Cf. *deduction, hypothesis.*

speculum metal. An alloy of 66 % copper and 33 % tin, with a trace of arsenic; used in making mirrors.

speise. A native arsenide; usually fusible and brittle.

speiss cobalt. $(FeNiCO)As_2$. An impure smaltite.

spelter. Commercial zinc used for galvanizing. **hard-** S. recovered from the dross from the galvanizing bath and containing 10 % iron.

Spengler's method. A method of staining a microscopical object by three successive treatments:

1. Carbolfuchsin; apply as usual.
2. Spengler No. 1 —a solution of 1 part Esbach's reagent and 1 part alcohol; stain, dry and decolorize.
3. Spengler No. 2—a saturated solution of picric acid; stain and dry.

sperm. A male reproductive cell. **s. oil.** The oil of the s. whale. **s. whale.** The mammal, *Physeter macrocephalus*, a source of spermaceti and ambergris.

spermaceti. Cetaceum. The solid fat from the head of the sperm whale, *Physeter macrocephalus;* chiefly cetyl palmitate. A white unctuous mass of faint odor, d.0.94, m.45; used pharmaceutically, and for standard candles, q.v.

spermin. $C_5H_{14}N_2$ = 102.1. A leukomaine and constituent of spermatic fluid, sputum and other animal substances. Colorless crystals, soluble in water; used as a nerve tonic and stimulant.

sperrschicht cell. A photoelectric cell which is sensitive over the whole range of the visual spectrum.

sperrylite. $PtAs_2$. A native platinum arsenide.

spessartite. $3MgO.Al_2O_3.3SiO_2$. A reddish variety of aluminum garnet (q.v.) found in Germany.

sp. gr. Abbreviation for specific gravity.

sphacelic acid. An acid from ergot.

sphacelotoxin. Spasmotin.

sphaerite. A hydrous phosphate of aluminum.

sphalerite. ZnS. Pseudo-galena. Zinc blende, blende, rosinjack, jack, mock ore. An isometric native zinc sulfide. Cf. *wurtzite.*

sphene $CaTiSiO_5$ Titanite A native yellow or brown calcium silicotitanite, found in rocks, it has a waxy lustre

sphenoid A hemihedral form of a crystal or a half crystal

sphere A globe or ball

spherical Ball-shaped or globular

spherocobaltite $CoCO_3$ A native cobaltous carbonate

spheroidal Sphere-shaped

spheroidization The formation of rounded grains in alloys, generally during annealing

spherometer An instrument for determining the curvature of a surface

spherulite A spherical group of minute radiating crystals

sphingoin $C_{17}H_{35}O_2N$ = 285 3 A leukomaine in the brain

sphingomyelin $C_{46}H_{96}N_2O_6P$ = 1035 00 A phospholipin from brain, yielding on hydrolysis phosphoric acid, choline, sphingosine and cerebronic acid

sphingosine $C_{17}H_{35}O_2N$ = 285 32 An unsaturated, aliphatic amino-alcohol split-product of the cerebrosides

sphygmograph A device for recording the pulse

sphygmomanometer A device for recording heart beats

spice A condiment or substance used to give flavor and distinctive taste to food, the majority contain essential oils Their ash content is an indication of their purity and the following are average standards for powdered spices

	Average total ash %	*Maximum ash permissible (U S A)*
allspice	4 5	(6 %)
anise	6 8	(9 %)
bay leaves	4 6	
basil	15 12	
calamus	4 6	
capers	2 1	
caraway	6 7	(8 %)
cardamon	6 7	(8 %)
cassia	4 3	(5 %)
cassia buds	4 7	
celery seeds	8 4	(10 %)
charlock	6 1	
cinnamon	4 0	(5 %)
cloves	6 1	(7 %)
coriander	5 4	(7 %)
cumin	7 6	(8 5 %)
dill	9 9	
fennel	8 1	(9 %)
fenugreek	3 0	
garlic	6 4	
ginger	4 9	(7 %)
juniper berries	2 7	
mace	2 3	(3 %)
marjoram	10 6	(16 %)
mustard	4 8	(5 %)
mustard flour	5 5	(6 %)
nutmeg	2 5	(5 %)
onion	4 3	
paprika	6 8	(8 %)
parsley	11 7	
pepper, black	5 0	(7 %)
pepper, red	6 3	(8 %)
pepper, white	1 3	(3 5 %)
safflower	6 7	
saffron	5 4	
sage	7 4	(10 %)
savory	9 9	
star anise	2 6	
tarragon	10 4	
thyme	9 8	(14 %)
turmeric	6 4	
vanilla bean	4 8	

(20 % variations of these percentages are not abnormal)

spicular Needle-shaped

spider poison Arachnolysin

spiegel (1) Spiegeleisen (2) The German for mirror

spiegeleisen Spiegel A white cast iron containing 5 to 20 % manganese, obtained in the blast furnace, and used to make manganese steels

Spiegler Jolle's reagent A solution of 2 gm mercuric chloride, 4 gm succinic acid, and 4 gm sodium chloride in 100 cc water, a reagent for albumin in urine

spigelia Pinkroot, Indian pink The dried rhizomes and roots of *Spigelia marilandica*, a Loganiaceae, which contain spigeline Used, as the fluid extract, as a teniafuge

spigeline An alkaloid from Spigelia species

spike (1) Plantain (2) Pepper **s nard** See *spikenard*

spikenard The aromatic root of a herb, *Nardostachys Jatamansi*, of the Valerianaceae **American-** Aralia

spilanthol $C_{14}H_{25}NO$ = 213 20 A liquid, b 1mm- 165, from *Spilanthus acmella* (called *usiSilli* by the Zulus), a Compositae of South Africa, used for toothache

spin Angular momentum, rotation around an axis, *e g*, of a nucleus or electron

spinacene Squalene

spinacine A protein derived from spinach leaves, *Spinacia oleracea*, a Chenopodiaceae, soluble in acid or alkaline water

spinasterol $C_{28}H_{46}O$ = 398 0 A phytosterol from spinach, occurring as α-, β- and γ-isomers Cf *cholane*

spindle A hydrometer

spindle tree Euonymus

spinel $MgAl_2O_4$ Rubicelle, ruby alamandine, ruby balas A native magnesium aluminate, variously-colored isometric crystals, some of which are used as gems

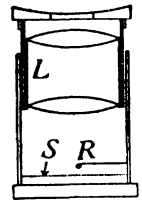
spinels A group of rock-forming aluminates or ferrates of the type $M''M'''_2O_4$, in which M'' may be magnesium, zinc, manganese, or ferrous iron, and M''' is aluminum, chromium, ferric iron or manganic manganese They have a high hardness and refractive index

spinel	$MgAl_2O_4$
hercynite	$FeAl_2O_4$
gaehnite	$ZnAl_2O_4$
magnetite	$FeFe_2O_4$
magnesioferrite	$MgFe_2O_4$
franklinite	$(Fe,Zn,Mn)Fe_2O_4$
chromite	$FeCr_2O_4$

spinneret (1) A platinum thimble with a flat base containing very minute holes through, which is forced rayon spinning solutions to form filaments (2) The spinning organ of spiders

spinning (1) To revolve around its axis (2) to form a thread **s electron** The fourth motion of an electron in an atom Cf *Pauli's exclusion principle* **s power** The property of a fluid which enables it to be drawn out into threads, as the white of an egg

spinthariscope Scintillascope An instrument for detecting radioactive rays It consists of a magnifying glass before a fluorescent screen, and a needle containing a trace of radioactive material on its tip Each α-particle striking the screen causes a flash and the radiations appear as fluorescent dots, appearing and disappearing irregularly near the tip of the needle



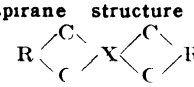
Spinthariscope L = eyepiece, R = radioactive matter, S = fluorescent screen

spinulosin $C_8H_8O_5$ = 184 1 3 6 Dihydroxy-4-methoxy-2 5-toluquinone Purple-bronze plates m201 having anti-bacterial properties formed in laboratory cultures of the mold *Penicillium spinulosum* (cf *penicillin*)

spiracin Methylcarboxyl salicylic acid A white crystalline powder insoluble in water used as a substitute for salicylic acid

spiraeic acid Salicylic acid

spirane structure The atomic arrangement,



R, X is an atom held in common by two rings, as in spiro-compounds or borosalicylates

spirans A spiro-compound

Spirillaceae The third family of the schizomycetes or bacteria they have curved or wave-shaped cells

Genus 1, spirosoma—without organs of locomotion

Group 2, microspira—rigid cells with few polar flagella

Group 3, spirillum—rigid cells, with many flagella

Group 4, spirochetae—flexible and mobile cells

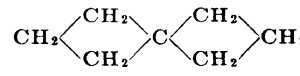
spirit (1) Any distilled liquid (2) A solution of a volatile substance in alcohol (3) Ethanol **cologne-** Ethanol **Colonial-** Methanol **Columbian-** Methanol **Libavius-** Stannic chloride **methylated-** Q v **motor-** Petrol (England) or gasolin (U S) **potato-** A whisky distilled from fermented potatoes **proof-** See *proof spirit* **pyroacetic-** Acetone **pyroligneous-** Methanol **pyroxylic-** Methanol **rectified-** 90 % Ethyl alcohol **silent-** The alcoholic spirit obtained by distillation of a spirituous liquor, before the addition of denaturants or other impurities **wood-** Methanol

s acid Concentrated acetic acid obtained by distillation of a 12 % vinegar **s of alum** Sulfuric acid **s of copper** Acetic acid obtained from copper acetate **s of ethyl nitrite** Spiritus aethylis nitritis, s of sweet nitre An alcoholic solution of 3 5–4 5 % (U S P) or 1 52–2 66 % (B P) ethyl nitrite, used in medicine **s of hartshorn** Ammonium hydroxide **s of niter** S of ethyl nitrite **s of salt** Hydrochloric acid **s of tin** Stannic chloride **s of vitriol** Concentrated sulfuric acid **s of wine** Ethyl alcohol **s of wood** Methanol

spirit(u)ous Having the character of spirit

spirit-colors A group of aniline dyes that are insoluble in water and soluble in alcohol, used in dyeing silk and as stains

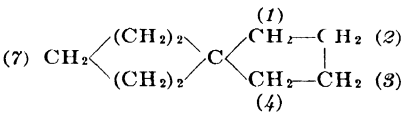
spiro-compounds Spirans, spirocyclans A group of organic compounds that comprise two rings joined by one carbon atom common to both rings, as, spiroheptane



Cf *ring structures* (E)

spirocyclans Baeyer's name for spiro-compounds

spirodecane $C_{10}H_{18}$ = 138 2 A group of bicyclic hydrocarbons, as,



5, 6- (7)

spiroform $C_{15}H_{10}O_4$ = 256 10 Vespyrin, acetylsalol acetylsalicylphenylester, acetylphenyl-o-oxybenzoic acid, $C_6H_4(OOCMe)COOPh$ A white tasteless powder, insoluble in water, used medicinally as an antirheumatic

spirogyra A filamentous alga, green felt-like mass or scum in fresh water ponds or tanks, used in biochemical experiments

spirosal $C_9H_{10}O_4$ = 182 1 Monoglycosalicylate, glysal, $C_6H_4(OH)COOCH_2CH_2OH$ An odorless colorless liquid b 170 slightly soluble in water, soluble in alcohol or ether, used medicinally in lotions

spitting Small explosions and scattering of materials occurring when certain substances are dried and heated or brought together, as, with sulfuric acid and water, or when molten materials cool and their surface crust is perforated by escaping gases Cf *decrepitation*

splash head A device fitted to a distillation apparatus between the flask and condenser, to prevent the boiling liquid from splashing over into the latter It consists usually of an open glass tube in a bulb, bent away from the direction of the flask, along which the vapor passes

split-product A decomposition product, *e g*, of a hydrolyzed glucoside

splitting The breaking of a molecule into two or more individual atoms

spodumene $(Li,Na)_2Al_2Si_4O_{12}$ Triphane A lithium aluminum silicate, occurring in large crystalline masses The pink variety, (kunzite) and green variety (hiddenite) are used as gems Some spodumene crystals are 47 feet long

spoilage Any disadvantageous change due to physical or chemical action, as melting of chemicals in warm weather (cf *shipping*), crystallizing or separating in cold weather, drying out or taking up water (cf *storage*), or decomposition (cf *hazard*)

spoilbank Bing

sponge (1) A marine animal, *Euspongia officinalis*, belonging to the Porifera (2) The flexible fibrous skeleton of the animal cut and dried It forms yellow porous masses of various shapes (3) A metal in porous form, as platinum sponge **iron-** Ferric oxide **platinum-** Platinized asbestos **vegetable-** Tufa

spongin A sclero-protein from bath sponge, which yields diiodotyrosine and bromine

spontaneous Sudden or voluntary, and without apparent external cause or incitement **s combustion** Self-ignition of inflammable material caused by the accumulation of heat by slow oxidation

sporangia Cells containing spores

spores The resting state of micro-organisms Single cells capable of growth and reproduction

spot analysis (1) A microchemical test, carried out on a porcelain plate, for the identification of metals, alkaloids, etc (2) A reaction on impregnated filter-paper

spout (1) A slightly-projecting depression on the rim of a beaker or other vessel through which liquids in the vessel are poured (2) The cylindrical projection of a teapot (3) A trough to conduct molten metals

spray A stream of air and finely-divided liquid produced with an atomizer, nebulizer or other device **s drying** A form of rapid evaporation, in which a solution is heated in the atomized state so that the dissolved substance falls out of the spray Cf *Nyrop process* **s residue** The amount of insecticide remaining on fruits, such as apples, pears, peaches and grapes The maximum amounts permitted per pound of food are 0 01 grain, arsenious oxide 0 018 grain, lead, 0 01 grain, fluorides

sprays (1) Pharmaceutical preparations used as antiseptics for throat, nose or other cavities The principal sprays consist of liquid petrolatum in which the active substances are dissolved as

aromatic spray	nebula aromatica
eucalyptol spray	nebula eucalyptolis
menthol spray	nebula mentholis
thymol spray	nebula thymolis

(2) Technical preparations used as insecticides fungicides or disinfectants for protecting plants or trees

Sprengel pump A mercury pump for obtaining a high vacuum (0 001 mm)

spring A source of a natural water **hot-** Water emerging from the soil at a temperature higher than 50°C

spring balance A device for determining the amount of a force by means of the extension it produces in a spring (See *Hooke's Law*)

sprinkler (1) A perforated iron or stoneware plate near the top of a gas-scrubbing tower It produces a rain of gas-absorbing liquid (2) A bushing filled with a low melting alloy (*e g* , D'Arcet metal) which, when heated, will release water from a pipe system

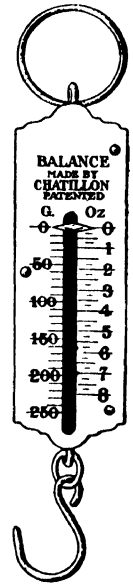
sprudel effect The phenomenon observed on gas-jet electrodes, from which the emerging gas bubbles are rising in a continuous stream or sprudel

sprue A projection left on a casting, to be broken off for testing purposes

spur feterita Sorghum

spurred rye Ergot

sputter To produce a metal in the finely-divided state by passing ahigh-potential discharge between two electrodes of the metal in a dielectric liquid or gaseous medium



Spring balance

sputum Saliva mixed with mucus and other secretions of the mouth or nose Sputum is usually examined microscopically but now it is also examined chemically Its composition varies greatly according to the food eaten and the time elapsing since a meal

Organic constituents	4 1–6 9 %
fatty acids	0 02–0 97 %
soaps	traces–0 40 %
cholesterol	traces–0 16 %
lecithin	traces–0 15 %
nuclein	traces 0 48 %
proteins	0 90–0 52 %
Inorganic constituents	0 3–0 9 %
Water	93 0–95 0 %

sq Abbreviation for square **sq ch** Square chain **sq cm** Square centimeter, or cm^2 **sq in** Square inch **sq ft** Square foot, ft **sq m** Square meter, or m^2 **sq mi** Square mile **sq yd** Square yard **sq rd** Square rod

squalene $C_{30}H_{50}$ = 410 40 Spinacene An unsaturated hydrocarbon found in the oils of the Elasmobranch fishes (shark family) and as its homologs in many marine oils A colorless oil, $d_{15°}$ 0 8610, b_{20mm} 284 Cf *carotene lycopin*

square A four-sided figure, whose sides are equal and whose angles are right angles **s centimeter** cm^2 A unit of area and the one-ten-thousandth part of a square meter, 1 cm^2 = 0 155 sq in **s foot** ft^2 or sq ft A unit of area in the English system, 1 ft^2 = 1 sq ft = 0 0929 m^2 = 929 cm^2 **s inch** in^2 or sq in A unit of area in the English system, 1 in^2 = 1 sq in = 6 452 cm^2 **s meter** m^2 A unit of area in the metric system, 1 m^2 = 10,000 cm^2 = 10 7638 sq ft = 1 196 sq yd = 24 7104 sq links = 0 039537 sq rods = 0 00247104 sq chains **s root** The square root of a quantity is that quantity which, when multiplied by itself, gives the original quantity **s yard** yd^2, or sq yd A unit of area in the English system 1 sq yd = 0 836 m^2

squaw root Caulophyllum **s vine** Partridge berries The dried herb of a small trailing, evergreen plant, *Mitchella repens* Used medicinally, as the fluid extract as a diuretic, astringent, and emmenagogue **s weed** Senecio

squill Scilla The fleshy inner scales of the bulb of *Urginea maritima*, a Liliaceae It contains several glucosides and bitter principles (scillin, scillitoxin, sinistrin), used medicinally as an emetic and expectorant

Sr The symbol for strontium

St Abbreviation for stoke

S T Surface tension

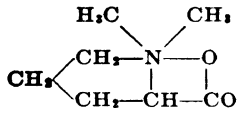
S T P Standard temperature and pressure

stabile Stable

stabilizer (1) A retarding agent, or a substance that counteracts the effect of a vigorous accelerator and preserves a chemical equilibrium (2) A substance added to a solution to render it more stable, as, acetphenetidin to cupferron solution, acetanilide to hydrogen peroxide

stable A balanced condition not readily destroyed, as, photo-s , thermo-s **s scopolamine** Scopomannite

stachydrine $C_7H_{13}O_2N$ = 143 1 A cyclic amino acid and heterocyclic compound occurring in many plant juices (as *Stachys* species) and in mussels (as *Arca noae*) Cf *trigonelline*

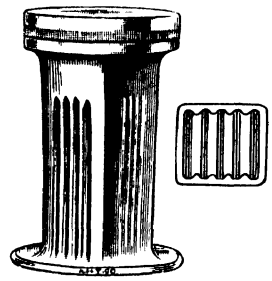


stachyose $C_{24}H_{42}O_{21}$ = 666 4 A non-reducing tetrasaccharide from the roots of *Stachys tuberifera*, a Labiatae It hydrolyzes to fructose glucose and two molecules of galactose, $[\alpha]_D^{20}$ + 148°

stagonometer Stalagmometer

Stahl, Georg Ernst 1660–1734 A German physician and chemist noted for his development of the phlogiston theory (1697)

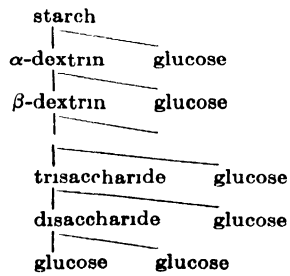
stain A substance that is used for coloring materials such as wood, tissues, textiles *Stains* are *dyes* in solutions, *paints* are *pigments* in suspensions **acid proof-** See *table top impregnation* **contrast-** q v **counter-** q v **microscope-** A dye used for staining preparations for microscopic examination



Staining jar

staining The coloring of materials by colored solutions In microscopy it is used for differentiating structural elements **s jar** A small, square glass vessel used in staining microscopic slides (see illustration)

staircase reaction A chemical change that proceeds step-wise, as, the hydrolysis of starch to glucose



stalactite A hanging column of calcite formed by the drip of carbonated mineral solutions from the roof of a cavern

stalagmite A standing column of calcite formed by the drip of carbonated mineral solutions on to the floor of a cavern

stalagmometer A device for obtaining drops of a liquid at definite intervals, *e g*, Traube's s, used to calculate surface tension by determining the number of liquid drops passing an orifice in a given time It can also be used to determine molecular weight (cf *Morgan equation*) and the association of liquids

stalagmometric Measuring the progress of chemical reactions (as esterifications) from the change in surface tension

stalagmones Characteristic substances occurring in urine and lowering its surface tension They are associated with certain diseases (as, tuberculosis, carcinoma, nephritis) and severe infections, and occur normally in pregnancy

stalloy An alloy of iron with 3–4 % silicon

stamen The male organ of a plant, in which the pollen is prepared Cf *pistil*

Stammer, Carl 1828–1890 A German chemist noted for his development of the sugar industry

stamp (1) To break up or crush ore and rock by machinery (2) A heavy mechanical pestle for crushing ore **s battery** A group of pestles working mechanically in an iron mortar Stamps are as heavy as 2000 pounds, and drop 6–8 inches 100 times per minute **s mill** An establishment for crushing ores by stamp batteries

stand oil An oil heated at 250–300°C without addition of oxygen or driers, and allowed to settle to remove coagulated "mucilage"

standard (1) An established form of quality or quantity (2) A substance used for establishing the strength of volumetric solutions, as, purified oxalic acid used as a standard in alkalimetry and acidimetry **s candle** A spermaceti candle that burns 120 grains per hour (See *standard lamp*) **s cell** An electrolytic cell having a definite voltage, as, the Clark and Weston cells **s conditions** In gas analysis an atmospheric pressure of 760 mm, and a temperature of 0°C, at latitude 45° It is sometimes abbreviated, S T P (= standard temperature and pressure) Cf *N T P* **s deviation** The expression $\sqrt{PQ/N}$, where P and Q are the percentages of positive and negative reactions, respectively, and N is the number of tests made **s lamps** A source of light for photometric determinations of a known light intensity, as,

pentane lamp	10 00 international candles
Hefner lamp	0 9 international candle
Carcel lamp	9 6 international candles
standard candle	1 0 international candle

s meter The length between two lines ruled on a bar of platinum-iridium, which is kept at the International Bureau of Weights and Measures, Sèvres, near Paris **s pressure** A pressure equal to a column of 760 mm mercury at sea-level in lat 45° **s solution** A solution of definite concentration, usually normal, half normal or tenth normal **s substance** A substance used to standardise volumetric solutions It should have the following properties (1) easily obtained in a state of sufficient purity, (2) unaltered in air and at moderate temperatures, and neither hygroscopic nor efflorescent, (3) readily soluble in water or alcohol, (4) a high molecular weight thus lessening effects of errors in weighing (5) produce no interfering product on titration, (6) free from color before and after titration, thus avoiding interference with the indicator **s temperature** A temperature of 0°C or 273°A **s thermometer** A thermometer, as prescribed by the United States Pharmacopoeia **s volume** The normal volume occupied by one mole of a gaseous substance, *i e*, 22 4 liters **s wavelength** The wave-length of the red cadmium line, observed in air at 15°C and 760 mm pressure It is equal to 6438 4696 Ångstrom Units The cadmium blue and green lines are also used

standardization The manipulations necessary to bring a preparation to an established or known quality, as, the preparation and adjustment of a standard solution in volumetric

analysis **physiological-** The testing of drugs or biological products (which cannot be chemically analyzed) by their pharmacological action on a normal animal Thus

digitalis	frog heart
strophanthus	frog heart
ergot	rooster (cocks comb)
aconite	guinea pig (toxicity)
cannabis	dog (intoxication)
adrenalin	dog (blood pressure)

standardized Describing a utensil, device or preparation that has been tested, measured and compared with a standard See *Bureau of Standards* (B S), *National Physical Laboratory* (N P L), *volumetric glass ware* **s buret** A certified buret checked at 20°C according to the methods of the Bureau of Standards or the National Physical Laboratory The limits of error are (B S)

Capacity	30 cc	50 cc	100 cc
Limit of error	0 03 cc	0 05 cc	0 1 cc

s cylinder A certified graduated cylinder checked according to the methods of the B S, or N P L The limits of error are (B S)

Capacity	10 cc	25 cc	50 cc
Limit of error	0 05 cc	0 12 cc	0 25 cc
Capacity	100 cc	250 cc	500 cc
Limit of error	0 2 cc	1 25 cc	2 5 cc

s flask A certified graduated flask checked according to the methods of the B S or N P L The limits of error are (B S)

Capacity	50 cc	100 cc	200 cc
Limit of error	0 50 cc	0 08 cc	0 10 cc
Capacity		500 cc	1000 cc
Limit of error		0 15 cc	0 30 cc

s pipet A certified pipet tested according to the methods of the B S or N P L The limits of error are (B S)

Capacity	2 cc	5 cc	10 cc
Limits of error for measuring pipet	0 01 cc	0 02 cc	0 03 cc
transfer pipet	0 006 cc	0 01 cc	0 02 cc
Capacity		25 cc	50 cc
Limits of error for transfer pipet		0 03 cc	0 05 cc

s solution See *solutions*

standards The agencies establishing or defining **s** in various countries are

A S A	American Standards Association
B S I	British Standards Institution
D V M	German Association for Testing Materials
A F N O R	French Association for Standardizing Materials
S A A	Standards Association of Australia
S O S	Swedish Standards Society
S V M T	Swiss Society for Testing Materials
C E S A	Canadian Engineering Standards Association
I S A	International Standards Association (Basle)

stannanes A group of organic compounds containing tetravalent tin, as,

tetramethyl-	$SnMe_4$
tetraethyl-	$SnEt_4$
tetraphenyl-	$SnPh_4$
dichlorodiphenyl-	$SnCl_2Ph_2$
bistannane	$H_3Sn\ SnH_3$
tristannane	$H_3Sn\ SnH_2\ SnH_3$

Cf *phenylstannane*

stannate A salt of stannic acid of the type, M_2SnO_3 **sulfato-** A compound of the type $R_2H_2Sn(SO_4)_3$ Cf *stannosulfate* **sulfo-** A salt of the type, M_2SnS_2 **thio-** A salt of the type, M_2SnS_3

stannated Treated with tin salts, as, s hydrochloric acid used in the Gutzeit test

stannekite $C_{20}H_{22}O_3$ A native, resinous hydrocarbon, in coal deposits in Bohemia

stannic A compound of tetravalent tin **s acids** A series of acids which vary in composition from H_2SnO_3 to H_4SnO_4 *normal-* or alpha- H_2SnO_3 = 168 7 A white amorphous powder, insoluble in water or alcohol, soluble in alkalis *meta-* or beta- $H_{10}Sn_5O_{15}$ = 843 6, $H_2Sn_5O_{11}$ or H_2SnO_3 A colorless amorphous powder, insoluble in alcohol or water, soluble in alkalis **s bromide** $SnBr_4$ = 438 4 A colorless, fuming, caustic liquid, d 3 349, m 31, b 203, soluble in water, decomp by alcohol, used as a mordant and in tinning **s chloride** $SnCl_4$ = 260 5 Tin bichloride or tin tetrachloride A colorless, fuming, caustic liquid, d 2 2738, m −33, b 114, soluble in water, decomp by alcohol, used as a mordant in dyeing and reviving colors, as a reagent, and for tinning **s chromate** $Sn(CrO_4)_2$ = 350 7 A brownish-yellow crystalline powder, soluble in water, used in ceramics as pigment **s ethide** Tin tetraethyl **s ethyl hydroxide** Tin ethyl hydroxide **s fluoride** SnF_4 = 194 7 A white, crystalline deliquescent solid, $d_{20°}$ 4 78, sublimes if heated, b 705 **s hydroxide** $Sn(OH)_4$ = 186 5 A white amorphous powder, insoluble in water or alcohol **s ion** The tetravalent cation Sn^{++++} **s. iodide** SnI_4 = 626 4 Tin tetraiodide A red crystalline powder d 4 696, m 144, b 341 decomposed by water, soluble in alcohol, ether or chloroform **s methide** Tin tetramethyl **s oxide** SnO_2 = 150 7 Tin dioxide, tin ash, flowers of tin, stannic anhydride A white amorphous powder d 6 95, m 1197, insoluble in water or alcohol, and soluble in alkalis Used as a polishing material for steel, glass and finger nails, and in the manufacture of milk-colored and opaque glass **s phenide** Tin tetraphenyl **s sulfate** $Sn(SO_4)_2\ 2H_2O$ = 346 9 Colorless rhombic crystals, soluble in water **s sulfide** SnS_2 = 183 80 Tin bisulfide, mosaic gold, tin bronze A yellow, hexagonal, crystalline powder, d 4 58, decomp at red-heat, insoluble in water, soluble in alkalis, used for bronzing and gilding

stannising A process for coating metal objects of complicated shape with tin, by suspending them for a few minutes in a mixture of vapours of hydrogen and stannous chloride at 500–600°C

stannine Stannite

stannite $SnS_2\ Cu_2S\ FeS$ Stannine, tin pyrites A native sulfide of tin, copper and iron

stannites Theoretically a salt of stannous acid of the type, M_2SnO_2 derived from stannous hydroxide There is no evidence for this, and the actual composition is $MHSnO_2$ or HSnOOM (cf HCOOM)

stannonate A salt of the type RSnOOM

stannonic acid A group of organic compounds of the types, $RHSnO_2$, or R SnOOH **s ester** A group of organic compounds of the types, RR′ SnO_2, or, RSnOOR′

stannonium An organic compound of tetravalent tin of the type $RSnH_3$ Cf *-onium, stannane, stannyl*

stannosulfate A salt of the type $M_2Sn(SO_4)_3$ Cf *sulfatostannate*

stannous A compound containing divalent tin, Sn⁼ **s bromide** $SnBr_2$ = 278 5 Tin protobromide Yellow crystals d 5 117, m 215, b 619, soluble in water, decomp by alcohol **s chloride** $SnCl_2$ = 189 6 Tin salt, tin protochloride A white crystalline mass, m 247, b 620 soluble in water, alcohol, or alkalis It absorbs oxygen from the air forms an insoluble oxychloride and is used as a reagent and reducing agent, and as a mordant in the manufacture of lakes *hydrous-* $SnCl_2 2H_2O$ = 225 7 Colorless triclinic crystals, d 2 7, m 37 7, decomp by further heat, soluble in water or alcohol, used as a reagent and in organic synthesis **s chromate** $SnCrO_4$ = 234 6 A brown powder, slightly soluble in water, used in ceramics as a pigment **s citrate** $SnC_6H_6O_7$ = 308 5 Tin citrate A white powder, slightly soluble in water **s ethide** Tin diethyl **s fluosilicate** $SnSiF_6$ = 260 76 S silicofluoride Colorless prismatic crystals very soluble in water **s hydroxide** $Sn(OH)_2$ = 152 7 An amorphous white powder, insoluble in water and soluble in fused alkalis with formation of stannites **s iodide** SnI_2 = 372 5 Red needles, m 316, slightly soluble in water, soluble in dilute acids or alkalis **s ion** The divalent cation Sn^{++} **s oxalate** SnC_2O_4 = 206 7 A white crystalline powder, insoluble in water, soluble in acids, used in dyeing **s oxide** SnO = 134 7 Tin monoxide, t protoxide A brownish-black powder, d 6 3, burns on heating, insoluble in water, alcohol or alkalis, used as a reducing agent **s sulfate** $SnSO_4$ = 214 8 A white crystalline powder, soluble in water, alcohol or acids, used as a mordant in dyeing **s sulfide** SnS = 150 8 A brown crystalline powder, d 5 08, m 882, b 1230, insoluble in water or alcohol, soluble in hydrochloric acid, decomp at red heat **s tannate** $SnC_7H_2O_5$-H_2O = 302 7 A dark brown crystalline powder, insoluble in water **s tartrate** $SnC_4H_4O_5$ = 250 7 A white crystalline powder soluble in water, used as a mordant in dyeing and printing textiles

stannum The Latin term for tin

stannyl The monovalent radical, H_3Sn—

staphisagria Stavesacre seed The ripe seeds of *Delphinium staphisagria*, a Ranunculaceae It contains a number of alkaloids, and is used externally as an insecticide **s alkaloids** The alkaloids of staphisagria

staphisagrine	$C_{32}H_{34}O_5N$
delphinine	$C_{29}H_{35}O_6N$
delphinoidine	$C_{32}H_{35}O_6N$
delphisine	$C_2H_{46}O_4N_2$
staphisagroine	$C_{20}H_{24}O_4N$

staphisagrine $C_{32}H_{33}O_5N$ = 391 3 Staphisaine An alkaloid from staphisagria

staphisagroine $C_{20}H_{24}O_4N$ = 342 20 An alkaloid from staphisagria

staphisaine Staphisagrine

Staphylococcus [pl -cocci] A genus of *Coccaceae* (Schizomycetes) forming grape-like clusters, many of which are pathogenic and produce pus, see *bacteria*

staphylotoxin A poisonous substance produced by staphylococcus cultures

staple fiber See fiber

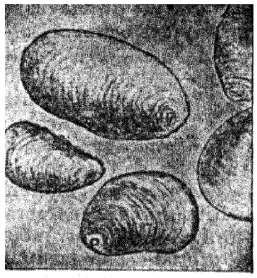
star (1) A group of needle-shaped crystals, which radiate from a common center (2) A sun-like body outside the solar system See *spectral classification* (3) A burner-attachment for holding small vessels **blazing-** Aletris **s anise** See *anise* **s grass** Aletris

starch $(C_6H_{10}O_5)_x$ = $(162\ 1)_x$ Amylum A group of carbohydrates or polysaccharides occurring in many plant cells The ordinary starch or potato starch is a white, soft, amorphous powder, d 1 5, insoluble in water, alcohol, or ether It hydrolyzes in "staircase" (q v) fashion to several forms of dextrin and glucose Its structure is not yet completely known, but the starch granules consist of at least two fractions (1) An envelope (80 %) of *amylopectin*, *α-amylose* or *α-starch*, which is less soluble contains a phosphoric acid ester, yields a paste and gives a violet color with iodine, and (2) an inner substance, *amylose*, *β-amylose*, or *β-starch* which is more soluble, free from phosphorus does not yield a paste, and turns blue with iodine

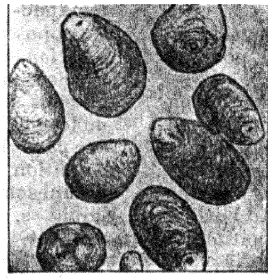
	α-amylose, per cent	β-amylose, per cent
corn-	15	85
potato-	3	97
rice-	12	88
tapioca-	16 5	83 5
wheat-	23 5	76 5

alant- Inulin **animal-** Glycogen **cassava-** Tapioca **corn-** Amylum The starch granules obtained from the fruit of *Zea mays*, Indian corn Used as paste, for starching fabrics, as a dusting powder, as a food and antidote for iodine, and chemically, as a reagent and indicator for iodine **lichen-** Lichenin **rice-** Rice flour The starch granules from the seeds of *Oryza sativa*, rice Used as nutrient, for starching fabrics and for pastes **nitro-** See *nitrostarch* **soluble-** See *s soluble* **wheat-** The starch granules from the seeds of *Triticum vulgare*, wheat, used as a reagent, for pastes and in starching fabrics (See illustration)

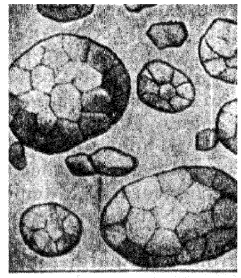
s glycerite A protective colloid prepared by heating starch with glycerol and diluting with water **s gum** Dextrin **s iodide s iodized** Starch iodide A bluish-black powder containing 2 % iodine, insoluble in water, used medicinally as an antiseptic It is produced by the reaction of starch and a solution of iodine, and is used as a test for either **s nitrate** Nitrostarch **s soluble** $C_{36}H_{62}O_{31}$-H_2O Amylodextrin A hexasaccharide and white powder obtained by heating starch with glycerin It gives a yellow color with iodine solution, is soluble in water and is used as an indicator, emulsifying agent, and in the textile industry **s sugar** A dextrose obtained by heating starch with dilute sulfuric acid It



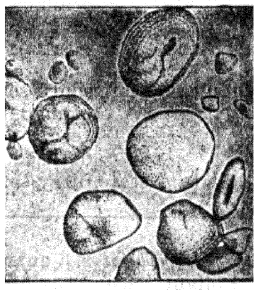
1. Potato



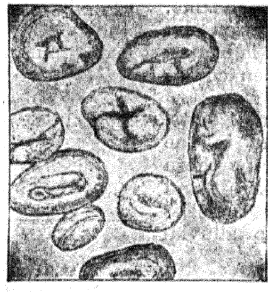
2. Arrowroot



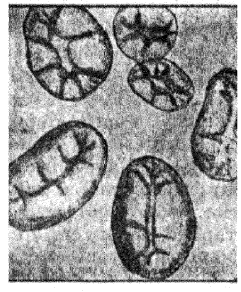
3. Oat



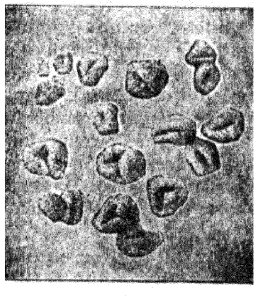
4. Wheat



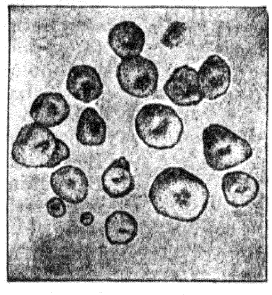
5. Pea



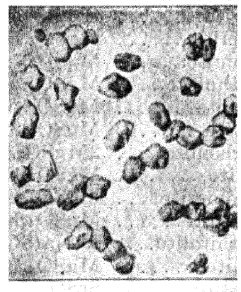
6. Bean



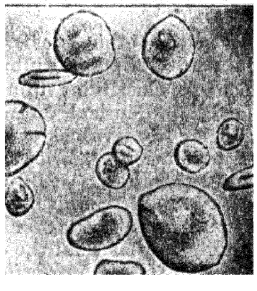
7. Rice



8. Maize

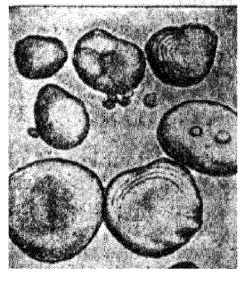


9. Buckwheat



10. Rye

arrowroot	2
barley	11
bean	6
buckwheat	9
maize	8
oat	3
pea	5
potato	1
rice	7
rye	10
wheat	4



11. Barley

Starches.

From: Hawk and Bergeim, Practical Physiological Chemistry.

consists of 1 part dextrose and 2 parts glucose, and is used as a syrup

Stark effect The action of an intense electric field causes a separation of the lines of a positive ray spectrum

starlite An artificial gem of a brilliant light green or blue color Blue zircon of Siam is burned from 6 to 8 hours and treated with cobalt nitrate or potassium ferrocyanide See *zircon*

starter A mixture of a culture of a suitable organism and nutrient medium, used to initiate large-scale fermentation, *e g* , in formation of cheese from milk curd, a culture of lactic acid-producing streptococci

Stas, Jean Servais 1813–1891 A Belgian chemist, noted for his determination of atomic weights **S pipet** A pipet, the jet of which has parallel walls so that the contents run out and the level stops at the same point each time

stassanization A method of sterilization by heat, similar to pasteurization Milk is heated at 167°F for 15–20 seconds, and then cooled rapidly to 40–45°F

Stassfurt salts A large deposit of oceanic salts, mainly chlorides and sulfates, found in the Magdeburg Halberstadt region in northern Germany, the principal salts are rock salt and anhydrite Cf *abraum salts* The deposits are arranged in layers under a top alluvial deposit and sandstone and include

Sulfates	
anhydrite	$CaSO_4$
gypsum	$CaSO_4\ 2H_2O$
glauberite	$CaSO_4\ Na_2SO_4$
polyhalite	$2CaSO_4\ MgSO_4\ K_2SO_4\ 2H_2O$
krugite	$4CaSO_4\ MgSO_4\ K_2SO_4\ 2H_2O$
kieserite	$MgSO_4\ H_2O$
epsomite	$MgSO_4\ 7H_2O$
vanthoffite	$MgSO_4\ 3Na_2SO_4$
bloedite	$MgSO_4\ Na_2SO_4$
loewite	$MgSO_4\ 2Na_2SO_4\ 2\frac{1}{2}H_2O$
langbeinite	$2MgSO_4\ K_2SO_4$
leonite	$MgSO_4\ K_2SO_4\ 4H_2O$
picromerite	$MgSO_4\ K_2SO_4\ 6H_2O$
schoenite	$MgSO_4\ K_2SO_4\ 9H_2O$
aphthitalite	$K_3Na(SO_4)_2$
kainite	$MgSO_4\ KCl\ 3H_2O$
celestite	$SrSO_4$
Chlorides	
halite or rock salt	$NaCl$
sylvite	KCl
sylvinite (sylvine)	$(K, Na)Cl$
douglasite	$2KCl\ FeCl_2\ 2H_2O$
carnallite	$KMgCl_3\ 6H_2O$
tachhydrite	$2MgCl_2\ CaCl_2\ 12H_2O$
bischofite	$MgCl_2\ 6H_2O$
baeumlerite	$KCl\ CaCl_2$
rinneite	$FeCl_2\ 3KCl\ NaCl$

stassfurtite A double salt of magnesium borate and chloride from Stassfurt

state (1) A condition (2) A form of aggregation or dispersion, as, colloidal-, (3) Orbit, energy level The condition of an electron in a neutral or ionized atom **activated-** See *activation* **amorphous-** Non-crystalline Describing a homogeneous solid in which the molecules are not symmetrically oriented Cf *crystal* **change of-** See *change* **colloidal-** Matter in finely-divided particles, surrounded by another medium See *colloidal systems* **crystalline-** A homogeneous, anisotropic solid, in which the atoms are symmetrically oriented **d-** See *orbital* **dissociated-** See *dissociation* **dynamic-** The condition of the atoms in an ion as opposed to the static s **equation of-** See *equation, gas laws* **excited-** See *excitation* **f-** See *orbital s* **fluid-** Molten, liquid, or gaseous s **gaseous-** A condition in which the molecules are in rapid and irregular motion See *gas* **irradiated-** See *irradiation* **liquid-** A condition between the solid and gaseous state **luminescent-** See *luminescence* **molten-** A liquid s above melting point temperature **nascent-** A newly-formed atom or molecule Cf *status nascendi* **orbital-** The position towards which electrons may fall during a quantum transition, as

Final state	Electrons are in	Spectral line produced be long to
s	lowest quantum state	sharp series
p	↓	principal series
d	↓	diffused serie
f	highest quantum state	fuzzy series

Cf *orbits, series* **p-** See *orbital s* **quantum** See *energy levels* **radiant-** See *incandescence luminescence, fluorescence* **s-** See *orbital s* **solid-** A condition in which the molecules are in slow motion as compared with the liquid s and in which they are held in more or less rigid and definite positions, which may be symmetrical (crystalline s) or non-symmetrical (amorphous s) **static-** The condition of atoms in a molecule, as opposed to dynamic- **steady** (1) A balance between intake and output, or between the formation and decomposition of a substance (2) If in a chain of reactions, A—B→ C, the amount or concentration of reactant B remains constant, while that of A decreases and that of C increases, then, B is in the steady state

static (1) The condition of rest or equilibrium as opposed to motion (dynamic) (2) The interference with wireless radiations produced by atmospheric electric charges or by the presence of other sources of electricity **s atom** See *Lewis-Langmuir atom* **s electricity** An electrical charge at rest, often produced by friction

statics A branch of science that deals with matter and forces in a state of equilibrium

statistics (1) The science of classifying numerical facts, judging collective numerical data, and determining probabilities from values obtained by enumeration or estimation "The mathematics of experiment" (Mather) (2) In particular the consideration of conditions and properties of matter (as the *average* normal value of a group of units) rather than the *actual* value of a single unit Cf *Heisenberg principle histogram, atomic* and *isotopic weights*

stator The stationary portion of a machine, as distinct from the revolving portion, rotor (q v)

status nascendi The nascent (q v) state, or the condition of a molecule at its formation during a chemical reaction Many elements are more active when newly-formed (as hydrogen), and it is assumed that in this state there exist free

atoms, H, that have not combined into the molecule, H_2 Cf *excitation*

staubosphere The dust content of the atmosphere [German, staub = dust]

staurolite Staurotide An iron aluminum silicate, sometimes used as a gem

staurotide Staurolite

stavesacre seed Staphisagria

steam Water vapor **superheated-** Water vapor that is heated under pressure to a temperature above 100°C

s bath A vessel surrounded by steam with or without pressure **s black** Hematoxylon **s distillation** Distillation by blowing steam through the liquid, to obtain a distillate consisting of water and substance **s gauge** See *pressure gauge*

steapsase Steapsin A lipase of the pancreatic juice that hydrolyzes fats to glycerol and free acids

steapsin Steapsase

steapsinogen The substance from which steapsase is formed or liberated

stearaldehyde $C_{17}H_{35}CHO$ = 268 28 Octadecanal* White scales, m 63 5, b $_{100mm}$261

stearamide $C_{18}H_{37}NO$ = 283 3 Octadecanamide*, stearic amide, $Me(CH_2)_{16}CONH_2$ White leaflets, m 109

stearate A salt or ester of stearic acid of the type, $C_{17}H_{35}COOM$, in which M is a monovalent metal or radical

stearic acid $C_{18}H_{36}O_2$ = 284 38 Octodecanoic acid*, *n*-octodecylic acid A monobasic fatty acid, $CH_3(CH_2)_{16}COOH$, occurring in many vegetable and animal fats Colorless, shining leaflets, d $_{70}$°0 852, m 69, b $_{100mm}$291, insoluble in water, soluble in alcohol or ether **s aldehyde** Stearaldehyde **s amide** Stearamide

stearin (1) $C_{57}H_{110}O_6$ = 891 0 Tristearin, glycerol tristearate, $C_3H_5(C_{17}H_{35}COO)_3$ A colorless crystalline mass, the chief constituent of many fats, d $_{65}$°0 943, m 71, insoluble in water, soluble in alcohol or ether (2) *commercial-* A mixture of fatty acids, prepared from fats by hydrolysis, used in the manufacture of candles and solid alcohol **lauro-** Laurin

stearolic acid $C_{18}H_{32}O_2$ = 280 3 *9*-Octadecynoic acid* The unsaturated acid, $Me(CH_2)_7C\,C(CH_2)_7COOH$ Colorless prisms, m 48, b 260, insoluble in water, slightly soluble in alcohol, soluble in ether

stearone $C_{35}H_{70}O$ = 506 74 *18*-Pentatriacontanone*, $(C_{17}H_{35})_2CO$ A solid, d 0 80, m 88, insoluble in water, soluble in hot alcohol or ether

stearonitrile $C_{17}H_{35}CN$ = 265,28 Octadecanenitrile* Colorless crystals, m 41

stearoptene Oleoptene The oxygenated portions of an essential oil consisting chiefly of the solid part (camphor, as opposed to the liquid part, as, eleoptene) *E g* , camphor of camphor oil, menthol of peppermint oil, thymol of thyme oil

stearoxylic acid $C_{18}H_{32}O_4$ = 312 35 *9 10*-dioxooctadecanoic acid*, $Me(CH_2)_7CO\,CO(CH_2)_7COOH$ A solid, m 86, insoluble in water, slightly soluble in alcohol or ether

stearyl Octodecanoyl* The monovalent radical, $C_{17}H_{35}CO$—, derived from stearic acid

steatite A variety of talc

stechiometry Stoichiometry

steel (1) Carbon steel A tough, elastic alloy of iron containing small quantities of carbon

mild or soft steel	less than 0 15 % C
medium steel	0 15–0 30 % C
hard steel	more than 0 30 % C

COMPOSITIONS OF TYPICAL STEELS

SAE number	Per cent C	Per cent Mn	Per cent P, S	Per cent Cr	
(1)	(2)	(3)	(4)	(5)	(6)
1 Plain carbon steels					
1010	0 1	0 45	c g		
1040	0 4	0 65	c g		
1095	0 95	0 40	b g		
1120	0 2	0 75	d h		
2 Straight nickel steels					Per cent Ni
2015	0 15	0 45	b f		0 5
2315	0 15	0 45	b f		3 0
2340	0 4	0 45	b f		3 0
2512	0 12	0 45	b f		5 0
3 Chrome-nickel steels					Per cent Ni
3115	0 15	0 45	b f	0 5	1 25
3140	0 4	0 65	b f	0 6	1 25
3215	0 15	0 45	b f	1 0	1 75
3240	0 4	0 45	b f	1 0	1 75
3315	0 15	0 45	b f	1 50	3 50
4 Molybdenum steels					Per cent Mo
4130	0 4	0 55	b f	0 65	0 2
4150	0 5	0 55	b f	0 95	0 2
4615	0 5	0 45	b f	1 75*	0 25
5 Chromium steels					
5130	0 2	0 45	b f	0 75	
5150	0 5	0 65	b f	0 95	
52100	1 0	0 35	b f	1 35	
6 Chrome-vanadium steels					Per cent V
6120	0 2	0 65	b f	0 95	0 18
6140	0 4	0 65	b f	0 95	0 18
6195	0 95	0 65	b f	0 95	0 18
7 Tungsten steels					Per cent W
7260	0 6	0 15	a e	0 75	1 75
71360	0 6	0 15	a e	3 5	13*
71660	0 6	0 15	a e	3 5	13*
9 Silico-manganese steels					Per cent Si
9250	0 5	0 75	c g		2 0
9260	0 6	0 75	c g		2 0

(2) Range is ±0 05 % C
(3) Range is ±0 15 % Mn

(4) Maximum is (*a*) 0 035 % P, (*b*) 0 04 % P (*c*) 0 045 % P, (*d*) 0 06 % P, (*e*) 0 04 % S, (*f*) 0 045 % S, (*g*) 0 05 % S, (*h*) 0 15 % S

(5) Range is ±0 15 % Cr (* is nickel)

(6) Range for Ni ±0 25, for Mo ±0 05, for V ±0 03, for W ±0 25 and for * ±1 5, for Si ±0 2 %

For phase diagram, see *iron* World production (1941) 143,000,000 long tons (for order of countries, see *iron*) (2) Alloy steel An alloy of iron whose properties are due to an element or elements other than carbon, such as, chromium, manganese nickel, tungsten, silicon Cf *S A E classification, ferrochromium, ferromanganese*

alloy- A mixture of iron and some other metal, fused together and cooled rapidly **alloy treated-** A steel which contains small quantities of other metals, incorporated during its manufacture for curative purposes, and not intended to produce the distinct properties of an alloy steel *E g*, a steel containing less than 1 % Mn, or 0 3 % Si **austenic-** A s containing 18 % Cr, 8 % Ni and 1–4 % Mo, used for acid-resisting utensils (not corroded by HNO_3 or H_2SO_4) **bullet-proof-** S containing 12 % Mn 1 % C and less than 0 02 % P or S **carbon-** An alloy of iron and carbon, variously treated, without the addition of other metals **chrome-molybdenum-** An alloy of iron and 0 8–1 1 % Cr, 0 4–0 6 % Mn, 0 15–0 25 % Mo and 0 25–0 35 % C used in the framework of aeroplanes **chromium-nickel-** See *stainless-* **high speed-** An alloy of iron containing 0 65 % C, 0 2 % Mn, 4 % Cr, 17 % W, and 5 % V The tungsten can be replaced by 8 5 % Mo It is used for tools and does not lose temper if heated **nickel-** See *nickel* **nickel-zirconium-** A tough, tenacious alloy of iron and 2 % Ni, 0 34 % Zr, 1 % Mn, 15 % Si and 0 4 % C, used for armor plates and helmets **stainless-** A steel which contains elements such as nickel and/or chromium, it does not tarnish on exposure and is used for high-grade cutlery, kitchen- and tableware etc **super-** A high-speed steel containing 4 % cobalt Cf *carboloy*

Steele microbalance A quartz instrument which consists of a beam with a small quartz-ball, whose buoyancy is changed by increasing or decreasing the air pressure It is the most delicate balance, and is sensitive to 4×10^{-6} mg, with its aid the density of 0 1 cubic millimeter of radium emanation was determined by Ramsay and Gray

Steenbock unit A vitamin unit, q v

Stefan-Boltzmann equation An equation indicating the radiations per square centimeter radiated per sec by a black body at absolute temperature, T, to surroundings at absolute temperature t_0 $E = \sigma(T^4 - t_0^4)$ (Cf *Wien's equation*) **S constant** The constant, σ (sigma), of the Stefan-Boltzmann equation $\sigma = 5\ 72 \times 10^{-12}$ watt/cm²/degree **S law** The total amount of energy (E in ergs) radiated from a black body (which is a perfect radiator) and due to heat alone, is proportional to the fourth power of the absolute temperature, $E = \sigma T^4$, where σ is $5\ 72 \times 10^{-5}$

steigerite $Al_2O_3\ V_2O_5\ 6\frac{1}{2}H_2O$ A yellow mineral found in the uranium deposits of Colorado

stellar (1) Pertaining to stars (2) Star-shaped, as, crystals **s evolution** See *spectral classification* **s spectra** See *spectral classification*

stellate crystals Stellar- or star-shaped crystals, as, phenyl glucosazone

stellite An alloy of steel with cobalt and 10–50 % chromium and/or tungsten, used for high-speed tools and instruments

stem correction The correction to be applied to a thermometer reading to allow for the portion of the mercury column not in the liquid

stench (1) An obnoxious odor (2) A group of malodorous gases used industrially, as, in mine warnings They are mercaptan, butyl mercaptan, amyl acetate, butyric acid or valeric acid

stenocarpine Gleditschine

stenosation A process for increasing tensile strength (*e g*, of viscose fibers) by treatment with formaldehyde

stenosine Sodium methyl arsenate

stephanite $5Ag_2S\ Sb_2S$ A native silver, antimony sulfide

step-wise decomposition A staircase reaction (q v), decomposition that proceeds gradually in a series of reactions **s dissociation** A gradual dissociation

steradian The solid angle which is subtended by a surface of a sphere equivalent to the square of the radius

stercobilin $C_{33}H_{46}N_4O_6 = 594\ 5$ The normal pigment of feces m 236 it is probably urobilin

stercorol Coprosterol

stercorite $Na(NH_4)HPO_4$ Native microcosmic salt

sterculia A genus of tropical plants, some of which yield edible seeds and barks, used for cordage and mats **s gum** Indian tragacanth, Indian gum A tragacanth-like exudation from *Sterculia* species, a group of trees and shrubs of India, used as a filler in ice-cream Cf *hog* gum

Sterculiaceae A group of soft-wood trees or shrubs

Cola acuminata	kola nut
Theobroma cacao	cocoa, cacao butter

Cf *adansonia, heretine, kapok*

stere A kilolter or 1000 liters (nearly 1 cubic meter)

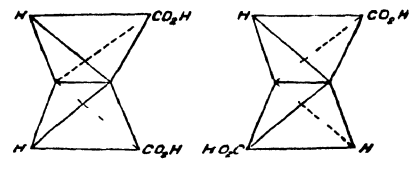
stereo- (1) A prefix derived from the Greek, indicating "solid" in structure or "three dimensional" (2) Abbreviation for stereotype

stereochemistry Spatial or configurative chemistry A branch of science that investigates the spatial arrangement of the atoms in a molecule

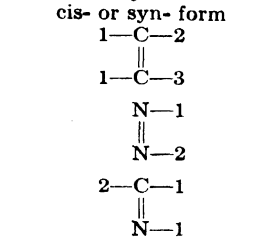
stereo-isomer Stereomer A compound containing the same number and kind of atoms as another compound, but with the atoms grouped differently in the molecule A stereo-isomer is optically-active and contains one or more asymmetric atoms either C, pentavalent N, S, Se, Sn, Cr, Co, or Pt

stereo-isomerism The phenomenon shown by optically-active compounds having different spacial arrangements of their atoms See *isomery, allelotropism* Types

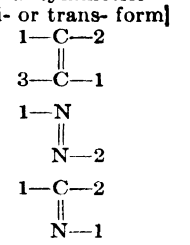
A Geometrical (due to double bond)



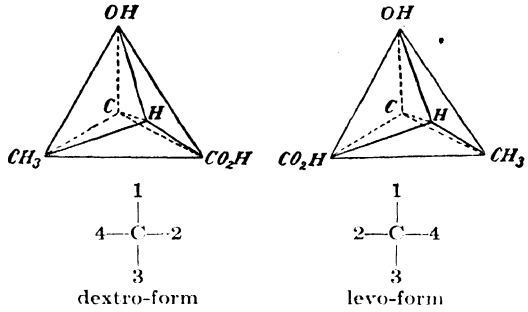
Plane symmetric cis- or syn- form



Axial symmetric anti- or trans- form



B. Optically-active (due to asymmetric atom)



dextro-form levo-form

stereomer. See *stereo-isomer.*

stereopticon. Balopticon. An instrument that projects an amplified image of an object.

stereoscope. A device for viewing a pair of photographs each simultaneously with one eye, and thus obtaining a perspective effect.

stereoscopic photographs. Two adjacent photographs of the same object, taken on the same plate at the same time, with two lenses. They are used to give depth and perspective to the picture.

stereoskiagraphy. The production of stereoscopic x-ray pictures; used to locate an opaque object in the human body.

stereotyping. An operation in printing in which the original type is used to emboss a plastic paper sheet (flong), which is then hardened and used to cast metal type for high-speed rotary letterpress machines.

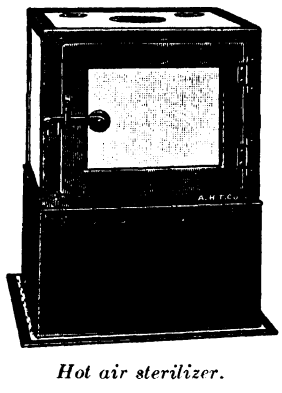
steric. Pertaining to the spatial arrangement of atoms in the molecule. **s. hindrance.** The non-appearance of the chemical reaction expected from a structural formula (two-dimensional); it is explained by the spatial arrangement of the atoms (three-dimensional). The presence of a particular atomic grouping in a certain position may inhibit or encourage the reaction.

sterid. Steroid.

steride. A tertiary lipid in which the alcohol is a sterol.

sterile. Aseptic or free from microorganisms. **s. solution.** A solution that has been made aseptic by the destruction or removal of all microorganisms.

sterilization. The destruction or removal of all living bacteria, microorganisms and spores. It is accomplished either physically (heat, sound, light, filtration) or chemically (antiseptics).



Hot air sterilizer.

sterilize. To render free from all living microorganisms and their spores.

sterilizer. An autoclave, steam or bake-oven, or other device for sterilization.

sterilizing The act of destroying or removing bacteria and their spores. Methods:

Glass and metal utensils:

(1) heat for two hours at 160–170°C. in a hot air oven;

(2) heat in a closed vessel (autoclave) under steam pressure at 115—120°C. for 15 minutes;

(3) heat in a current of steam for 30 minutes;

(4) boil in water for 20 minutes;

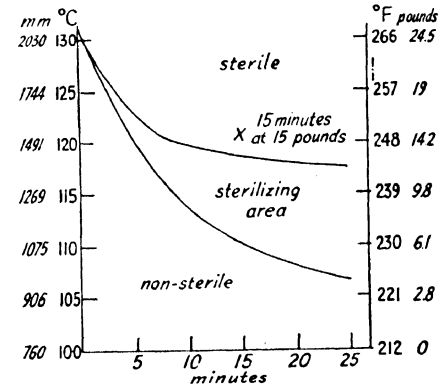
(5) boil in a solution of sodium bicarbonate (1:1000) for 20 minutes.

Solutions in their containers:

(1) If the solution is not decomposed by heat, proceed as above.

(2) If the solution is decomposed by heat, filter through a stone, porcelain, or alundum filter, the entire apparatus having been previously sterilized.

s. area. A pressure-temperature diagram on which the thermal death-points of all bacteria are marked by a wedge-shaped figure (see illustration).



Sterilizing with steam.

sternbergite. $Ag_2S.Fe_4S_5$. A native sulfide of iron and silver.

sternutatives. An agent that produces sneezing. **poison gas-** Substances that are used in explosive shells and cause, on liberation, violent sneezing; as, diphenylchlorarsine, ethyldichlorarsine, and diphenylcyanoarsine.

sternutatory. Able to produce sneezing.

steroid. Sterid. A generic name for the group of compounds comprising the sterols, bile acids, heart poisons, saponins and sex hormones.

sterols. A group of solid alcohols derived from vegetable sources, which consist chiefly of high-atomic *monohydric* unsaturated alcohols. *E.g.*,

farnesol, $C_{15}H_{26}O$.....	acacia
colocynth sterol, $C_{20}H_{34}O$.	colocynth
cucurbitol, $C_{24}H_{40}O_4$.....	watermelon seed
withaniol, $C_{25}H_{36}O_6$.....	*Withania coagulans*
homotaraxasterol, $C_{25}H_{40}O$	dandelion
fongisterol, $C_{25}H_{45}O$.....	ergot
bombicesterol, $C_{26}H_{44}O$...	silkworm chrysalis
isocholesterol, $C_{26}H_{46}O$...	wool fat

ergosterol, $C_{27}H_{42}O\ H_2O$	yeast, animal tissues
cholesterol, $C_{27}H_{46}O$	animal and plant tissues
stigmasterol, $C_{27}H_{46}O$	calabar beans
sitosterol $C_{27}H_{46}O$	wheat, corn, etc
phytosterol, $C_{27}H_{46}O$	many plants
coprosterol $C_{27}H_{48}O$	feces
dihydrositosterol, $C_{27}H_{48}O\ H_2O$	wheat
hippocoprosterol, $C_{27}H_{54}O$	horse feces
taraxasterol $C_{29}H_{48}O$	dandelion
clutyianol, $C_{29}H_{50}O_2$	*Clutyia similis*
psylla alcohol $C_{33}H_{58}O$	psylla wax
asteriasterol	starfish

They appear to be derivatives of chrysene with a branched unsaturated side-chain See *cholane*

sterro metal An alloy consisting of 56 5 % copper, 40 % zinc, 1 5 % iron and 1 % tin It is stronger than gun-metal or bronze

sterule An ampoule or glass container containing a sterile solution

Stetefeldt furnace A furnace for roasting silver and copper ores and at the same time exposing them to chlorine gas

steviol The non-sugar component of stevioside

stevioside A glucoside 300 times as sweet as sugar, from the leaves of Kaa-ha-e, *Stevia rebaudiana*, a Compositae of South America

stew To cook in boiling water or other liquid

Stewart-Kirchhoff law The light waves emitted by a hot gaseous body can be absorbed by the same substance at a lower temperature Cf *Fraunhofer lines*

stibate Antimonate

stibiate Antimonate

stibic Antimonic

stiboconite $Sb_2O_3(OH)_2$ Antimony ocher Stibite A native hydroxide of antimony

stibide Antimonide, stibnide A binary compound of antimony and another element (hydrogen or a metal)

stibine (1) Antimonous hydride (*2*) An organic compound of the type, SbR_3 **triphenyl-** $Sb(C_6H_5)_3 = 352\ 8$ Antimony triphenyl A colorless crystalline powder, m 48 **s hydroxide** An organic compound of the type, R_2SbOH

stibious Antimonous

stibite Stiboconite

stibium Antimony

stibnate Antimonate

stibnic Antimonic

stibnide Stibide

stibnite Antimony glance

stibnous Antimonous

stibonic acid An organic compound of the type, R_2SbO_2H

stibonium The monovalent radical, SbH_4^+, analogous to ammonium **s compounds** A group of organic compounds derived from stibine and stibonium, of the general type R_4SbX, in which antimony is pentavalent **s hydroxide** A compound of the type, R_4SbOH **s iodide** A compound of the type, R_4SbI

stibono The monovalent radical, $(HO)_2OSb—$

stibosan $NH_2\ C_6H_4\ SbO(OH)ONa\ 5H_2O$ The antimony analogue of atoxyl, used medicinally

stick (1) A rod or cylinder, *e g*, of dynamite (2) Gummy or viscous, as, syrup (3) A thick syrup obtained by evaporation of the water used in making tankage It contains 1 5–10 % N and is mixed with other fertilizers

stick lac See *lac*

Stieglitz, Julius Oscar 1867–1937 An American chemist noted for organic research and otherwise

stigmastane $C_{29}H_{48} = 396\ 35$ A hydrocarbon derived from stigmastanol

stigmastanol $C_{29}H_{48}O = 412\ 3$ A hydrogenation product of stigmasterol

stigmasterol $C_{29}H_{46}O = 410\ 35$ A sterol, m 170, from calabar beans, soy beans and vegetable oils Cf *cholane*

stilbamidine 4 4′-diamino stilbene-di-β-hydroxyethane sulfonate A drug used in the treatment of kala-azar

stilbene $C_{14}H_{12} = 180\ 17$ Diphenylethylene, toluylene, bibenzal, Ph CH CH Ph An unsaturated hydrocarbon Colorless rhombic leaflets, d 0 970, m 124, b 306, insoluble in water, soluble in alcohol or ether **diamino-** See *diamino stilbene* **dibenzoyl-** $C_{28}H_{22}O_2 = 390\ 16$ Acicular oxylepidine (Ph CH COPh)$_2$ **phenyl-** Triphenylethylene

s diol $C_{14}H_{12}O_2 = 212\ 09$ Vinylene-bisphenol HO C_6H_4 CH CH C_6H_4 OH **s hydrate** $C_{14}H_{14}O = 198\ 2$ Toluylene hydrate, Ph CHOH CH_2 Ph Colorless crystals, m 62, soluble in alcohol **ar-** PhCH CHC_6H_4OH Ar-hydroxy stilbene styryl phenol

stilbite $(Na_2,Ca)O\ Al_2O_3\ 6SiO_2\ 6H_2O$ A native hydrated sodium calcium aluminum silicate of the zeolite group, pearly white prisms

still Any apparatus in which a substance is heated to the gaseous state (as, a retort, vaporizer, or evaporator) and the gaseous products condensed (as a condenser or fractionating column) (See *distillation*) **column-** As for fractional distillation **pot-** A distillation apparatus for whisky or other potable spirits **vacuum-** A device for distilling at a low temperature, under a reduced pressure obtained by a vacuum pump **water-** As for distilling water

s head Fractionating column A device for selectively refluxing the less volatile components of mixtures under distillation thus rendering fractionating more efficient

stillingia Queen's root, silver leaf, yaw root The dried roots of *Stillingia sylvatica*, an Euphorbiaceae of North America It contains alkaloids, used medicinally, the fluid-extract, as an alterative and expectorant

stillingine An alkaloid obtained from stillingia

stillingoid The combined principles of the root of stillingia used medicinally as an alterative

stilpnomelane FeSiO An iron metasilicate which contains Al, Ca and Mg

stimmi Sb_2S_3 A black, native antimony sulfide

stimulant An agent that excites or increases a functional activity Cf *sedative*

stinging nettles Urtica

stinkstone Anthraconite

stinkweed Stramonium

stirrer A device for agitating liquids

stirring rod (1) A glass rod bent in various shapes, and mechanically driven by water or an electric motor, for agitating liquids (2) glass rod used for stirring Cf *policeman*

stizolobin A globulin from Chinese velvet beans, *Mucuna* (*Stizolobium*) *pruriens*, a Leguminosae

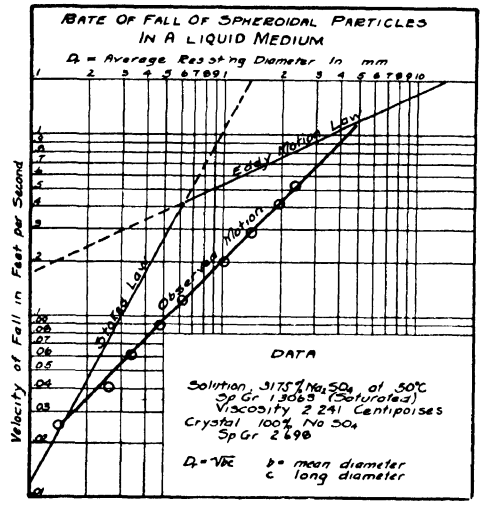
stoechiometry Stoichiometry

stoichiometry A branch of chemistry that deals with the numerical relationship between elements or compounds, (atomic weights), the determination of the proportions in which the

elements combine, (formulae), and the weight-relations in reactions (equations)

stok(e) St The unit of kinematic viscosity, n, as determined from Stokes' law It equals dynamic viscosity in poises/density at the same temperature Viscosity of water at 20°C = 1 0018

Stokes, George Gabriel 1819–1903 An English mathematician noted for laws of hydrodynamics and optics **S law** A mathematical equation that indicates that the rate of fall, v, of a spherical body of radius, a, under gravity, g, is dependent on the viscosity of the medium (η in C G S units) $v = \frac{2ga^2}{9\eta}(\sigma - \rho)$, where σ and ρ are the density of the substance and of the medium respectively This equation is used in the calculation of the charge on an electron by Millikan s method For sedimentation (q v) the formula is $v = \frac{gD(\sigma - \rho)}{18\eta}$, where D is the effective diameter of the particle of density σ in a liquid of density ρ Cf *settling*



(from R B MacMullin Double Bond, 9 115 1937)

D mm	v observed	v in ft per sec Stokes' law	Eddy law
2 331	0 535	6 00	0 812
1 970	0 426	4 28	0 747
1 415	0 291	2 21	0 633
1 036	0 201	1 19	0 542
0 622	0 122	0 426	0 419
	critical velocity		
0 489	0 089	0 263	0 372
0 343	0 061	0 130	0 312
0 261	0 041	0 075	0 271
0 145	0 025	0 023	0 203

stolzite $PbWO_4$ Native lead tungstate

stomach A digestive pouch between the esophagus and the intestines, in which partial digestion of food takes place **s contents** The partly-digested food materials, mixed with salivary and gastric juices, usually examined for free hydrochloric acid, lactic acid, total acidity, ferments and blood **s enzyme** Pepsin **s juice** Gastric juice **s tube** A rubber tube, used as a syphon to wash out the stomach or to take samples of s contents

stomachic An agent that stimulates the appetite or increases gastric secretions, as gentian, cinchona nux vomica

stone (1) A standard British weight, equal to 14 pounds (2) Concrete mineral matter or pieces of rock (3) A concretion or calculus, q v **blue-** Copper sulfate **gall-** Calculus **Lydian-** Jasper **precious-** Gem **rotten-** See *rotten s* **touch-** See *touchstone* **s flax** Asbestos **s root** Collinsonoid **s ware** See *ceramics, earthenware, pottery*

stonecrop The herb of *Penthorum sedoides*, a Crassulaceae, used as a laxative

Stoner energy levels See *S quanta* **S quanta** A modified Bohr theory, which deals with the distribution of electrons in different energy levels The quantum number, k, of Bohr is divided into functions, k_1 and k_2, from which a systematic relationship of the lines of x-ray spectra is found Accordingly there are for

K	L	M	N	O	P	shells
1	3	5	7	5	3	energy levels

and the respective quantum numbers are

shell	K	L		M			etc
Bohr	1_1	2_1	2_2	3_1	3_2	3_3	etc
Stoner	$1_{1(1)}$	$2_{1(1)}$ $2_{2(1)}$	$2_{2(2)}$	$3_{1(1)}$	$3_{2(1)}$ $3_{2(2)}$	$3_{3(3)}$	etc

The numbers denote $n_{k_1(k_2)}$ The electron distribution reduced for the noble gases is shown in the table below Cf *Pauli's principle*

stoneroot Rich weed, knob weed, horsebalm The root of *Collinsonia canadensis*, a Labiatae, used as stomachic and diuretic Cf *collinsoid*

stool The discharge from the bowels, feces, q v

stopping power The capacity of substances to absorb α-particles, as compared with that of air It is proportional to the atomic number, N $\sigma = kN^{\frac{1}{2}}$, where k is a constant and σ the stopping power

storage (1) The keeping of a chemical in its most suitable container and condition (cf *hazard*), *e g* ,

Immersed in a hydrocarbon liquid (oil, kerosene, naphtha)	sodium, potassium, etc
Immersed in water	white phosphorus, picric acid
Dry	peroxides and hygroscopic chemicals

K $k_2 = 1$	L 1 1 2	M 1 1 2 2 3	N 1 1 2 2 3 3 4	O 1 1 2 2 3	P 1 1 2
He 2					
Ne 2	2 2 4				
A 2	2 2 4	2 2 4			
Kr 2	2 2 4	2 2 4	2 2 4		
Xe 2	2 2 4	2 2 4 4 6	2 2 4	2 2 4	
Rn 2	2 2 4	2 2 4 4 6	2 2 4 4 6 6 8	2 2 4	2 2 4

Cool	volatile and inflammable substances
Ventilated	odoriferous and combustible substances
Isolated	explosives and acids
Dark	light-sensitive substances, dyes
Warm	liquid phenol, phosphoric acid, glacial acetic acid creolin, sodium silicate, formaldehyde
Tightly covered	Ammonium salts citric acid, potassium or sodium hydroxide, lead salts, zinc salts

s battery An electrical accumulator, q v **s cell** See *accumulator* **s tank** Gasometer (2) A large, usually round, iron or concrete structure, used to keep liquids

storax Styrax A semi-liquid balsam from the wood and inner bark of *Liquidambar orientalis*, a Hamamelidiaceae of western Asia It contains styrol, styracin and cinnamic acid, insoluble in water, slowly soluble in alcohol, soluble in ether **s oil** The volatile oil of s , d 0 890–1 100, b 150–300, containing styrene and cinnamic esters Cf *liquidambar*

storesin $C_{36}H_{55}(OH)_3$ = 538 46 A hard resin from storax **alpha-** An amorphous mass, m 160–168 **beta-** A white flocculent mass, m 140–145

stovaine $C_{14}H_{21}O_2N$ = 235 19 Benzoyldimethylaminomethylpropanol hydrochloride, $MeCH_2C(PhCOO)MeCH_2NMe_2$ The hydrochloride of 2-benzoxy-2-methyl-1-dimethylaminobutane Small, lustrous scales m 175, soluble in water, used as a local anesthetic

stovarsol Acetarsone

stove (1) A heating device in which the flame is covered (2) To heat a paint or varnish film on metal to convert it into a protective and/or decorative coating, *e g* , at 160–260°F

S T P An abbreviation for standard temperature and pressure (0°C and 760 mm) Cf *N T P*

strain (1) A deformation resulting from stress It is the increase in length per unit original length (2) To filter through a coarse filter, so as to remove large solid particles **s theory** Baeyer's theory The assumption that the normal lines of force of the valency bonds of a carbon atom run from the center of a tetrahedron to each of the four corners, and make an angle of 109° with each other The stability of the five- and six-atomic rings is thus explained, also, the instability of aliphatic double bonds, and rings which contain a greater or less number of atoms Cf *molecular diagram, porphin ring*

stramonium Thornapple leaves, Jamestown or Jimson weed, stinkweed, apple of Peru The dried leaves of *Datura stramonium*, a solanaceous plant containing various alkaloids, used medicinally as a nerve sedative and antispasmodic **s seeds** The seeds of stramonium containing atropine, hyosycamine, oil, resin, and proteins, used as a hypnotic and antispasmodic

strata Pl of stratum, q v (1) The geological layers of rock on the earth surface (2) The several layers of the atmosphere (3) The seams of minerals

stratification The formation of layers, as in Liesegang rings q v

stratiform Describing a form of bacterial growth in a solid culture medium, characterized by liquefaction near the walls of the tube which then proceeds downwards

stratometer An instrument by which the hardness of a soil is determined from the distance it sinks in the soil under a given impact

stratum A geological layer See *epoch, strata, geologic era*

streak The colored line produced when a mineral is rubbed across unglazed porcelain **s test** The approximate gold-content of an alloy is determined by streaking a fine-grained silica stone, covered with charcoal, with the alloy, and comparing the streak with those produced by alloys of known compositions The streaks are again compared after treatment with dilute aqua regia Cf *touchstone*

stream-line filtration Edge filtration A principle of filtration in which the filter acts in a plane perpendicular to the direction of motion (stream-line) of the liquid The usual type of s l filter consists of a pack of stout paper sheets held together in a press, the filtrate passes between the sheets and emerges through holes running along the length of the pack Pressure or suction is employed Cf *filter press*

Strecker reaction The formation of amino acids by the action of ammonia on cyanohydrins

strengite The ore $FePO_4 2H_2O$

streptococcus A group of round or spherical bacteria arranged in strings or rows pl **-cocci**

streptolysin A protein which, when activated by reducing enzymes, hemolyses red blood corpuscles

stress The force per unit area that produces or tends to produce deformity of a body Cf *strain*

striate Striped, provided with lines

string A gold-plated quartz thread 1 5–6μ thick, used for Einthoven galvanometers

stripped atom An atom from which one or more electrons have been removed by electrical means, hence, the gaseous ion of an element Cf *ionization potential, isosteres, kernel spectral classification*

stripping (1) The removal of light fractions (*e g* , of lubricating oil distillates) by distillation with superheated steam (2) The removal of dyestuffs from textiles by immersion in chemical or bleaching reagents

stroboscope Rotoscope A mercury arc or neon lamp coupled with a periodically-discharging condenser By regulating the frequency of the flashes (up to 2000 per second) the motion of fast-moving machinery can be observed

stroboscopic Pertaining to the stroboscope **s illumination** Examined by the light of the stroboscope **s photography** A moving picture of quick moving objects having rotary, oscillatory or vibratory motion and illuminated by the stroboscope which reduces it to slow motion Cf *chronoteine*

strofantin Misspelling for strophanthin

stromatin A constituent of blood corpuscles, which forms a loose compound with hemoglobin

Stromeyer, Friedrich 1786–1835 A German apothecary, noted as discoverer of cadmium (1817), quantitative analytical methods and textbooks

stromeyerite $(Ag,Cu)_2S$ A native sulfide of copper and silver

strontia Strontium oxide

strontianite $SrCO_3$ A native strontium carbonate

strontium Sr = 87 63 An alkaline earth metal and element, atomic number 38 It is a crystalline silver-white metal d 2 54 m 900 b 1000, slowly soluble in water forming the hydroxide It occurs in nature as strontianite and celestite, and forms only one series of compounds (valency, two) **s acetate** $Sr(C_2H_3O_2)_2\ \frac{1}{2}H_2O$ = 214 7 A white crystalline powder, soluble in water, used medicinally as an anthelminthic **s arsenite** $Sr(AsO_2)_2 \cdot 4H_2O$ = 373 7 A white powder, soluble in water, used as an insecticide **s bromate** $Sr(BrO_3)_2\ H_2O$ = 361 5 A colorless, deliquescent, crystalline powder, decomp 240 soluble in water **s bromide** $SrBr_2$ = 247 5 Colorless needles, d_{24}° 4 2, m 630, soluble in water or alcohol *hydrous-* $SrBr_2\ 6H_2O$ = 355 6 Colorless hygroscopic crystals, d 2 358, soluble in water or alcohol, used medicinally as a tonic **s caffeine sulfonate** Symphorol **s carbonate** $SrCO_3$ = 147 6 Native as strontianite Colorless rhombic crystals, d 3 62, decomp 1155, insoluble in water, soluble in acids, used as a source of strontium salts **s chlorate** $Sr(ClO_3)_2$ = 254 6 Colorless rhombic or monoclinic crystals, d 3 152, m 290 decomp , soluble in water, alcohol or ether, used in pyrotechnics for red fires **s chloride** $SrCl_2$ = 158 6 A colorless crystalline powder, d 3 054, m 872, soluble in water or alcohol *hydrous-* $SrCl_2\ 6H_2O$ = 266 6 Colorless hexagonal needles, d 1 964, m 112, soluble in water or alcohol, used as a reagent and in pyrotechnics **s chromate** $SrCrO_4$ = 202 7 Yellow monoclinic crystals, d 3 895, insoluble in water, soluble in acetic acid or ammonium hydroxide **s citrate** $Sr_3(C_6H_5O_7)_2$ = 640 8 A colorless crystalline powder, soluble in water **s dioxide** S peroxide **s dithionate** $SrS_2O_6,4H_2O$ = 319 81 Plates, d 2 373, insoluble in alcohol **s fluoride** SrF_2 = 125 6 Colorless cubic or octahedral crystals, d 2 44, m 902, decomp 1190, insoluble in water, soluble in acids, used as an antiseptic **s fluosilicate** $SrSiF_6\ 2H_2O$ = 265 72 S silicofluoride White monoclinic crystals, d 2 99, very soluble in water **s formate** $Sr(OOCH)_2$ = 177 6 Colorless rhombic crystals d 2 69, m 71 9, soluble in water *hydrated-* $Sr(OOCH)_2\ 2H_2O$ = 213 68 White powder, d 2 695, soluble in water **s glycerophosphate** $SrC_3H_7PO_6\ (H_2O)_x$ A white crystalline powder, soluble in water, insoluble in alcohol **s hydroxide** $Sr(OH)_2$ = 121 7 Strontium hydrate A colorless powder, d 3 625 m 375, slightly soluble in water *hydrous-* $Sr(OH)_2\ 8H_2O$ = 265 8 Colorless, tetragonal, deliquescent crystals, d 1 396, very slightly soluble in water, soluble in ammonium hydroxide Used in beet sugar manufacture for crystallization of the sugar from the molasses **s hyposulfate** $SrS_2O_6\ 4H_2O$ = 319 6 A colorless crystalline powder, soluble in water **s hyposulfite** S thiosulfate **s iodide** SrI_2 = 341 5 Colorless hygroscopic plates, d 4 549, m 402, slightly soluble in water, soluble in alcohol *hydrous-* $SrI_2\ 6H_2O$ = 449 6 Colorless crystals, d 4 415, slightly soluble in water soluble in alcohol, used medicinally as a KI substitute **s lactate** $Sr(C_3H_5O_3)_2\ 3H_2O$ = 319 8 A white granular powder, soluble in water or alcohol, used medicinally as a diuretic and antirheumatic **s monoxide.** S oxide **s nitrate** $Sr(NO_3)_2$ = 211 7 Colorless cubic or octahedral crystals, d 2 93, m 645 (decomp), soluble in water *hydrous-* $Sr(NO_3)_2 \cdot 4H_2O$ = 283 7 Colorless triclinic crystals d 2 249, soluble in water, slightly soluble in alcohol, used in pyrotechnics for red fires, and red signal rockets **s nitrite** $Sr(NO_2)_2$ = 179 8 A white powder, soluble in water **s oxalate** $SrC_2O_4\ H_2O$ = 193 7 A white crystalline powder, decomp by heat, insoluble in water, soluble in acids Used in pyrotechnics **s oxide** SrO = 103 63 Strontia, s monoxide Colorless rhombic crystals or grayish-white porous powder, d_{15}° 4 36, m 3000, decomp by water, used industrially in beet sugar manufacture **s peroxide** SrO_2 = 119 62 A fine, white, odorless and tasteless powder, slightly soluble in water, soluble in acids Used medicinally as an antiseptic, also as a bleaching agent *hydrous-* $SrO_2,\ 8H_2O$ = 263 76 White crystals, decomp at red heat **s phosphate** $Sr_3(PO_4)_2$ = 452 8 A white powder soluble in acids, insoluble in water, used medicinally as a tonic *acid-* $SrHPO_4$ = 183 7 Colorless rhombic crystals, d 3 544, insoluble in water or alcohol, soluble in ammonium hydroxide or sodium chloride solutions **s platinocyanide** Platinum strontium cyanide **s saccharate** $C_{12}H_{22}O_{11},2SrO$ = 549 52 An almost insoluble salt by means of which sugar is separated from molasses The sugar is separated by precipitation of the strontium as carbonate **s salicylate** $Sr(C_7H_5O_3)_2\ 2H_2O$ = 397 6 A colorless crystalline powder, soluble in water or alcohol, used medicinally **s silicofluoride** $SrSiF_6,2H_2O$ = 265 8 A very soluble solid **s sulfate** $SrSO_4$ = 183 7 Native as celestine Colorless rhombic crystals, d 3 71 decomp white heat, insoluble in water, slightly soluble in acids Used in pyrotechnics **s sulfide** SrS = 119 7 Colorless regular crystals or a light-gray powder d 3 72, soluble in water or alcohol Used as a depilatory and as a constituent of luminous or phosphorescent paints **s sulfite** $SrSO_3$ = 167 7 Colorless crystals, decomp by heat, insoluble in water, soluble in sulfurous acid **s tartrate** $SrC_4H_4O_6\ 4H_2O$ = 307 6 A white crystalline powder, slightly soluble in water **s thiosulfate** $SrS_2O_3\ 5H_2O$ = 289 83 Strontium hyposulfite Colorless needles, d 2 16, soluble in water insoluble in alcohol

strophanthic acid $C_{23}H_{30}O_8$ = 434 3 A dibasic acid derived from strophanthin, decomp 270, insoluble in water, soluble in sulfuric acid

strophanthidin $C_{23}H_{32}O_6$ = 404 3, or $C_{22}H_{30}O_7$ = 474 29 An aglucone from strophanthus, m 178

strophanthin $C_{31}H_{46}O_{12}$ = 612 5 Methyloubain, strophanthum A mixture of glucosides (strophantidin, strophantobiose methyl ether, etc) from the ripe seeds of strophanthus A white or faintly-yellow extremely poisonous crystalline powder, m 179, soluble in water or alcohol, used medicinally as a heart tonic **crystallized-** Ouabain **G-** Ouabain **K-** The glucosides from *Strophanthus kombe*

strophanthobiose $C_{12}H_{22}O_{11}$ = 326 17 A disaccharide obtained by partial hydrolysis of strophanthin It hydrolyzes to mannose and rhamnose

strophanthum Strophanthin

strophanthus The dried ripe seeds of *Strophanthus Kombe* or other species, an Apocynaceae of Africa and Asia, used medicinally for heart-diseases

structural Pertaining to the arrangement of atoms in a molecule **s formula** A representation (on a plane surface) of the atomic arrangement of a molecule

structure (1) The mode of linkage of atoms in a molecule, especially of an organic compound, it is represented by a graphical formula, a structure symbol, a molecular diagram or molecular model (2) The constitution of the nucleus, or the arrangement of nuclear particles, q v (3) The arrangement of electrons in the atom **atomic-** Structure (3) Cf *constellation* **molecular-** Structure (1) Cf *atomic distance, molecular models* **nuclear-** Structure (2) Cf *isotopes, radioactive elements*

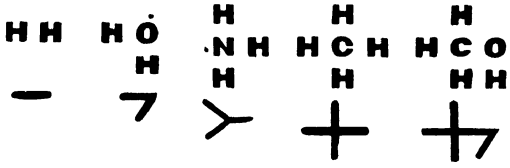
structure-symbol A geometrical figure that indicates the arrangement of the atoms in an organic molecule It represents the valence skeleton of carbon, hydrogen, oxygen and nitrogen of the compound Each line indicates a bond or a pair of electrons The terminals or junctions of lines indicate the atoms as follows

A hydrogen atom at the end of each line,

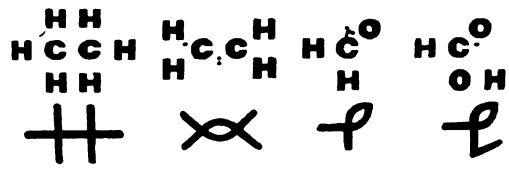
An oxygen atom at the junction of two lines,

A nitrogen atom at the junction of three or five lines and

A carbon atom at the junction of four lines Thus



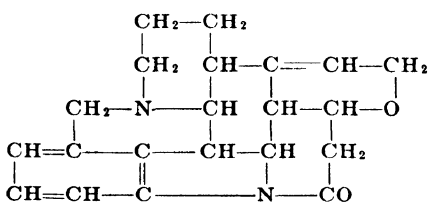
Single, double and triple bonds are shown, respectively, by straight and curved lines as follows



Atoms of elements, other than the above are represented by their symbols in their respective locations **electronic-** As showing the relative positions of electrons, see *bonds, molecular diagram*

Strutt, John William See *Rayleigh*

strychnine $C_{21}H_{22}O_2N_2$ = 334 3 Vauqueline An alkaloid from various species of *Strychnos ignatia* and *S nux vomica*



Colorless tetragonal crystals, m 268, slightly soluble in water, soluble in alcohol or ether Used medicinally in small doses as a tonic and stomachic, also as a rat and pest poison **dimethoxy-** Brucine **methyl-** A yellow powder, soluble in water or alcohol

s acetate (Str)$C_2H_4O_2$ = 394 3 Small colorless crystals soluble in water, used medicinally **s arsenate** (Str)H_3AsO_4 = 476 3 A colorless crystalline powder, soluble in water, used medicinally in ampoule medication **s arsenite** (Str)$HAsO_2$ = 442 4 Colorless crystals, slightly soluble in water, used medicinally **s bisulfate** (Str)H_2SO_4 = 432 3 Colorless needles, soluble in water **s cacodylate** (Str)AsO_2Me_2 = 471 3 A white powder, soluble in water **s citrate** (Str)$C_6H_8O_7$ = 497 4 Colorless crystals, soluble in water **s glycerophosphate** (Str)$C_3H_7PO_6$ = 504 3 Colorless crystals, soluble in water, used in ampoule medication **s hydrobromide** (Str)-HBr = 415 3 Colorless needles, soluble in water, used medicinally **s hydrochloride** (Str)HCl $1\frac{1}{2}H_2O$ = 397 7 Colorless trimetric crystals, soluble in water, used medicinally **s iodate** (Str)HIO_3 = 510 2 Colorless crystals, soluble in water **s lactate** (Str)$C_3H_6O_3$ = 424 4 A white crystalline powder, soluble in water **s nitrate** (Str)HNO_3 = 397 3 Colorless needles, decomp by heat, soluble in water, alcohol, glycerin or ether Used medicinally as a tonic and stomachic **s phenolsulfonate** (Str)$PhOHSO_3$ = 508 4 A white crystalline powder, soluble in water or alcohol **s phosphate** $(Str)_2H_3PO_4\ 9H_2O$ = 928 5 Colorless crystals, soluble in water **s salicylate** (Str)$C_7H_6O_3$ = 472 4 A white crystalline powder, soluble in water or alcohol **s sulfate** $(Str)_2H_2SO_4\ 5H_2O$ = 856 7 Colorless prisms, anhydrous at 200, soluble in water, alcohol or ether, used medicinally as a tonic and stomachic **s valerate** (Str)-$C_5H_{10}O_2$ = 436 4 A colorless crystalline powder, soluble in water or alcohol, used medicinally as a tonic and sedative

strychninium A strychnine containing pentavalent N Cf *piperidinium*

Strychnos A genus of tropical trees belonging to the Loganiaceae They yield strychnine, nux vomica, ignatia, curare, akazgine, copalchi, hoangnan, and ipoh

stucco A mixture of calcium sulfate, sand, and lime, used as a decorative building material

Stuffer law Sulfones, in which two $=SO_2$ groups are on adjacent carbon atoms, will be readily saponified

stuffing A dyeing process in which the textiles are first run through the color and afterwards through a mordant **s box** A box containing asbestos or other packing which fits round the point where a moving rod passes through the side of a vessel containing a fluid, and thus prevents leakage

sturin $C_{36}H_{69}O_7N_{16}$ = 753 65 A protein from the sperm of the sturgeon

sturnutatory Sternutatory

Stutzer's reagent A suspension of cupric hydroxide in aqueous glycerol used to separate proteins from other nitrogenous constituents of plants, *i e*, "albuminoid" from "amido" nitrogen The hydroxide is precipitated from a solution of 100 g copper sulphate crystals in 5 liters of water containing 2 5 cc glycerol, rubbed in a mortar with water containing 5 cc

glycerol per liter, washed free of alkali and made into a gelatinous but pipettable mass by rubbing with 10 % aqueous glycerol

stylophorum The herb of *Stylophorum diphyllum*, a Papaveraceae It contains the alkaloids, chelidonine, protopine, sanguinarine and chelerythrine

styphnic acid $C_6H_3O_8N_3$ = 245 1 Trinitroresorcinol, 2 4-dihydroxy-1 3 5-trinitrobenzene A yellow crystalline substance of the picric acid type, d 1 829, m 180, used in explosives

styptic An astringent or agent that contracts blood vessels and stops hemorrhage when applied locally, as, alum, tannic acid, ferric chloride, Monsel's solution

stypticine $C_{12}H_{15}O_4N$ HCl = 273 5 Cotarnine hydrochloride A decomposition-product of narcotine Yellow crystals, soluble in water or alcohol, used medicinally as a styptic, astringent and hemostatic

styptol Cotarnine phthalate A yellow crystalline powder, soluble in water or alcohol, used as a styptic

styracine $C_{18}H_{16}O_2$ = 264 2 Cinnamyl cinnamate The ester of cinnamic alcohol and cinnamic acid, PhCH CHCOOCH$_2$CH CHPh It is a solid constituent of liquidambar or styrax, m 44, used in perfumery

styracol $C_{16}H_{14}O_2$ = 238 1 Cinnamyl guaiacol, $C_6H_4(OC_9H_7O\ CH_3)$ Colorless crystals, soluble in alcohol, used as an antiseptic

Styrax (1) A genus of trees and shrubs, Styraceae, that yield balsams, as, storax, benzoin (2) Storax

styrene (1) C_8H_8 = 104 1 Cinnamene, styrolene, phenethylene, styrol, vinylbenzene, phenylethylene, Ph CH CH$_2$ A constituent of storax, essential oils, and coal tar A colorless, aromatic liquid, d 0 925, b 145, soluble in alcohol or ether Used in organic synthesis, and forms two types of derivatives, as, o-, m-, p-aminostyrolene, aminovinylbenzene = $NH_2C_6H_4CH\ CH_2$ ω-, p-aminostyrolene, phenylvinylamine = $C_6H_5CH\ CHNH_2$ (2) The bivalent radical, —CHPh CH$_2$—

styrilic acid Cinnamic alcohol

styrol (1) Styrolene (2) Colloidal silver

styrolene Styrene **s alcohol** Cinnamic alcohol

styron (1) Cinnamic alcohol (2) Trade name for a polystyrene plastic **m-methoxy-p-oxy-** Coniferol

styryl The monovalent radical PhCH CH— derived from styrolene **s alcohol** Cinnamyl alcohol **s amine** C_8H_9N = 119 1 PhCH CHNH$_2$ A colorless liquid, b 236, insoluble in water, soluble in alcohol **s ketone** $C_{17}H_{14}O$ = 210 1 Dibenzylideneacetone 1 5-diphenyl-3-pentadienone*, (Ph CH CH)$_2$CO Colorless crystals, m 112 **s methylketone** Benzylidene acetone

S U Saccharomyces unit, q v

sub- A prefix derived from the Latin, and indicating "below" "almost," "under" or "near" It is used to designate a lower form of oxidation or a basic compound, and indicates deficiency of the substance or radical it describes Cf *per-*

subacetate A basic acetate, as, lead subacetate

subatomic Pertaining to the structure of the atoms themselves, as distinct from their function as parts of a molecule **s decomposition** A radioactive disintegration, or other phenomena in which an atom is split or divided Cf *radioelement* **s particle** See *particles* **s reaction** A change in which an atom is disintegrated or transformed, as in nuclear chemistry, q v

subatomics A branch of science that investigates the structure of the atoms and the rôle of electrons and nuclei in subatomic changes Cf *atomic structure, isostere, periodic system, nuclear reaction*

subcarbonate A basic carbonate

subcutaneous Located beneath the skin **s injection** The administration of a drug by injecting it under the skin

subdural injection The administration of a drug by injecting it into the outermost membrane of the brain or spinal cord

suber Cork

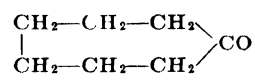
suberane C_7H_{14} = 98 1 Cycloheptane*, heptamethylene, $(CH_2)_7$ A colorless liquid, m —13, b 117, soluble in alcohol

suberic acid $C_8H_{14}O_4$ = 174 1 Octanedioic acid*, *1 6*-hexanedicarboxylic acid A dibasic acid and homolog of oxalic acid, $(CH_2)_6(COOH)_2$, obtained by oxidation of cork Colorless needles, m 140, b 300, soluble in water, alcohol or ether

suberin The fat extracted from cork

suberol $C_7H_{14}O$ = 114 1 Cycloheptanol* Colorless liquid, d 0 958, b 185 2

suberone* $C_7H_{12}O$ = 112 1 Cycloheptanone, ketoheptamethylene The heptatomic ring compound,



A colorless oily liquid obtained by distilling calcium suberate, d 0 969, b 180, slightly soluble in water, soluble in alcohol or ether

suberyl The monovalent cyclic radical, C_7H_{13}—, derived from suberane **s alcohol** Suberol

sublamine $HgSO_4\ 2C_2H_4(NH_2)_2\ 2H_2O$ = 452 6 Mercuric sulfate ethylene diamine A white crystalline powder, soluble in water, used medicinally as a non-irritant germicide

sublethal Below fatal, not quite fatal **s dose** The administration of a drug in quantities below the fatal dose

sublimate (1) A solid or condensed substance obtained by heating a material, as, the deposit formed on the charcoal block or in a glass tube, after heating certain substances which pass directly from the solid to the vapor phase and then back to the solid state (2) Mercuric chloride **corrosive-** Mercuric chloride

sublimation The transformation of a solid to a gaseous substance, followed by condensation to the solid state It differs from distillation in that the solid does not pass through the liquid state It is used to purify substances such as mercuric chloride, iodine, camphor

sublime To successively volatilize and condense a solid

submicron A particle between 2×10^{-6} and 5×10^{-7} cm in diameter ($0\ 2\mu - 5m\mu$) Cf *amicron* They are visible under the ultramicroscope, but not under the ordinary microscope

subnitrate A basic nitrate, as, bismuth subnitrate

subnormal Below normal

suboxide That oxide of an element which contains the lowest proportion of oxygen

subsoil The layer below the surface soil It contains the soluble organic portion of the latter, washed into it by rain

substance A particular kind of matter The material of which a body is composed, as, a chemical compound or a mixture of compounds

substantive dyeing The coloring of fabrics without mordants

substantive dyes A group of coal tar colors, chiefly for cotton, that impart color directly and without mordanting, as, benzidine dyes, primulin, congodiamine

substituent The atom or radical that enters into the structure of a molecule and replaces another atom or radical

substitute (1) To replace one element or radical in a compound by another element or radical (2) Ersatz A substance used in place of another

substituted Pertaining to a compound in which one or more atoms or radicals have been exchanged for one or more others **s compound** A compound obtained by substitution, a derivative, q v Cf *nucleus, group*

substitution Describing (1) A reaction in which an atom or group of atoms in a molecule is exchanged for another atom or group of atoms A term used mainly in connection with organic compounds (2) A reaction in which an element or radical is either oxidized or reduced, and a portion of it combines with the displaced element, as

$$MN + 2X = MX + XN$$

SUBSTITUTIONS

alkaline fusion	OH for SO_3H
alkylation	R for H
halogenation	X for H
nitration	NO for H
reduction	NH_2 for NO_2
sulfonation	SO_3H for H

substitutive derivate A compound formed by the replacement of one atom or radical by another atom or radical, as, $C_6H_6 \rightarrow C_6H_5Cl$ It differs from an additive derivative in that in the latter one or more atoms are added to the molecule, as, $C_6H_6 \rightarrow C_6H_6Cl_2$

substrate The material upon which an enzyme or ferment acts, the substance acted upon

subsubmicron Amicron

subsulfate A basic sulfate

subultramicroscopic Matter in such a high degree of dispersion as to be invisible in the ultramicroscope Cf *amicron*

succinaldehyde $C_4H_4(CHO)_2 = 86\ 07$ Butanedial* Five forms

α—liquid b 169	δ- -solid, m 135
β—liquid, b 171	ϵ—solid, m 95 (decomp)
γ—solid, m 64	

methyl- Pyrotartaraldehyde

succinamic acid $C_4H_7O_3N = 117\ 1$ Amidosuccinic acid, β-carbamylpropionic acid, $COOH\text{-}CH_2CH_2CONH_2$ A white, colorless powder, soluble in water **amino-** Asparagine

succinamide $C_4H_8O_2N_2 = 116\ 1$ Diamidosuccinic acid, butanediamide*, $(NH_2COCH_2)_2$ Colorless needles, m 242 (decomp), soluble in water, insoluble in alcohol or ether **hydroxy-** Malamide **phenetyl-** Pyrantin

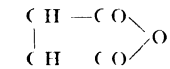
succinamyl The monovalent radical, $—OC\text{-}(CH_2)_2CONH_2$

succinate A salt of succinic acid of the type $C_4H_4(COOM)_2$

succinelite Succinic acid obtained from amber

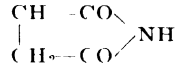
succinic acid $C_4H_6O_4 = 118\ 1$ Ethylene dicarboxylic acid, amber acid, butanedioic acid* A bibasic acid and homolog of oxalic acid, $HOOC\,CH_2\,CH_2\,COOH$ It occurs in amber and various other resins as colorless monoclinic prisms, d 1 554, m 184, b 235, slightly soluble in water, alcohol or ether, used as a reagent **iso-** $CH_3\,CH\,(COOH)_2$ A solid, d 1 455, m 130, (decomp), soluble in alcohol or ether, insoluble in water **α-amino-** Aspartic acid **diamido-** Succinamide **dihydroxy-** Tartaric acid **ethyl-** See *ethyl-succinic acid* **formyl-** Aconic acid **hydroxy-** Malic acid **keto-** Oxalacetic acid **methyl-** Pyrotartaric acid **methylene-** Itaconic acid

s aldehyde Succinaldehyde **s anhydride** $C_4H_4O_3 = 100\ 1$ Succinyl oxide, butanedioic anhydride* The pentacyclic compound,



Colorless needles d 1 104, m 120, b 261, insoluble in water, soluble in alcohol or ether **s peroxide** $C_8H_{10}O_8 = 234\ 2$ Alphozon alphogen $(HOOC\,CH_2\,CH_2\,CO)_2O_2$ A white fluffy powder soluble in water, used as germicide and mouthwash

succinimide $C_4H_5O_2N = 99\ 1$ Butanedimide* The imide of succinic acid,



Colorless octahedral crystals m 124, b 287, soluble in water alcohol or ether

succinite (1) An amber-colored grossularite or aluminum garnet, q v (2) Baltic amber, it contains 4 % of succinic acid

succinol An oil obtained by distilling amber

succinonitrile Ethylene cyanide

succinoresinol $C_{12}H_{10}O = 180\ 2$ An alcohol from amber

succinyl Butanedioyl* The bivalent radical, $—OC\,CH_2CH_2\,CO—$, derived from succinic acid **s chloride** $(CH_2COCl)_2 = 154\ 97$ Succinyl dichloride, butanedioyl chloride*, $C_2H_4(COCl)_2$ A colorless, fuming highly refractive liquid d 1 412 m 16, b 190 used in organic synthesis **s oxide** Succinic anhydride

suchar An activated carbon, used for decolorizing sugar or other solutions

sucramine The ammonium salt of saccharin

sucrase Invertase

sucrate A compound of sucrose

sucroclastic Describing a glycolytic enzyme

sucrol $C_9H_{12}O_2N_2 = 180\ 2$ Dulcin, p-phentylurea, valzin, *p*-ethoxyphenylurea, *p*-phenetolcarbamide, $NH_2\,CO\,NH\,C_6H_4\,OEt$ Colorless lustrous needles, m 173, slightly soluble in water, soluble in alcohol or ether It is 200 times as sweet as cane sugar, and is used for sweetening

sucrolite A synthetic resin plastic of the formaldehyde-urea type, in which most or all of the former is replaced by sugar or molasses, some are transparent

sucrose $C_{12}H_{22}O_{11} = 342\ 2$ Cane sugar, saccharobiose, beet sugar, saccharose A di-

saccharide, hydrolyzing to fructose and glucose, $[\alpha]_D^{20} + 66.5°$ Colorless monoclinic crystals, d 1.588, m 160 (decomp), soluble in water, slightly soluble in alcohol Cf *sugar refining* Used extensively as a food, for preserves, jams, confectionery, beverages and for sweetening, also in explosives **s octa-acetate** A white powder, m 69–72, having a very bitter taste, used as denaturant for rubbing alcohol (4.25 lb added to 100 gallons)

suction The act of sucking Drawing a fluid into a pipe **s gas** The coal gas contained in producer-gas when coal is used in place of coke **s pump** See *pump*

sucuuba bark Plumiera

sudan s I Sudan yellow **s II** Xylidine azo-β-naphthol A brown dye **s III** Sudan red **s IV** Scarlet Red **s brown** A fat-soluble diazo-dye, soluble in alcohol **s red** $C_{22}H_{16}ON_4 = 352.3$ Aminoazobenzeneazo-β-naphthol, sudan III $Ph\,N{:}NC_6H_4\,N{:}NC_{10}H_6OH$ A brown powder, insoluble in water, soluble in alcohol or ether, used as a microscope stain and for coloring fats **s yellow** $C_{12}H_{10}O{:}N_2 = 214.2$ Aniline azo-β-naphthol, sudan I A red powder, insoluble in water, soluble in alcohol or fats, used to color oils and varnishes

sudanite rock A mixture of talc and magnesite

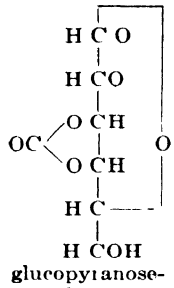
sudorific A diaphoretic, or an agent that causes the production of sweat

suet Tallow (1) Pharmaceutically The fat from the abdominal cavity of sheep, it contains chiefly stearates and palmitates, with some oleates of glycerol A colorless unctuous mass, m 45–50, soluble in alcohol or ether Used in the preparation of ointments and cerates, and in cooking (2) Culinarily The fat from beef (3) Industrially The solid fat from any animal

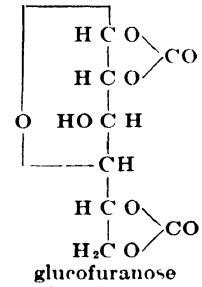
suffocating gases A group of poison gases (q v) used in warfare, that stop respiration, as, Cl_2 or $COCl_2$

sugar (1) A carbohydrate having a sweet taste, general formula, $(C_nH_{n}O_n)$ or $C_nH_{2n-2}O_{n-1}$, cf *carbohydrates*, *monosaccharides*, *furanoside*, *pyranoside*, *sweetness* See table (2) Generally sucrose **acorn-** Quercitol **avocado-** A mannoketoheptose isolated from the avocado or alligator pear **beechwood-** Xylose **beet-** A sucrose from the sugar beet, *Beta vulgaris* **blood-** Glucose **brain-** Cerebrose **cabbage-** A triose from cabbage leaves **cane-** A sucrose from sugar cane, *Saccharum officinalis* **collagen-** Glycocoll **corn-** Glucose **diabetic-** A misnomer for saccharin **fruit-** Fructose **gelatin-** Glycocoll **grape-** Glucose **gum-** Arabinose **heart-** Inositol **invert-** See *invert-sugar* **larch-** Melezitose **liver-** Glycogen **malt-** Maltose **maple-** A crude s, chiefly sucrose, of agreeable flavor made from the sap of certain maples (*Acer saccharum A nigrum* etc) native in Eastern Canada and the North-Eastern United States **meat-** Inositol **milk-** Lactose **muscle-** Inositol **palm-** A sucrose from the toddy palm, *Caryota urens*, or the coconut palm, *Cocos nucifera* Cf *jaggery* **priming-** See *priming sugar* **reducing-** A s that will reduce Fehling's solution at the boiling point This is indicative of free aldehyde or keto groups which are not in glucoside combination with other molecules **sorghum-** A sucrose from sugar millet, *Sorghum saccharatum* **stone-crop-** A heptose in *Sedum spectabile* **wood-** Xylose **yeast-** A sulfur-containing sugar, found in small traces in yeast

s cane *Saccharum officinarum*, the source of cane sugar **s carbonate** A carbonic ester of sugars as



glucopyranose-carbonate



glucofuranose dicarbonate

s of lead Lead acetate **s refining** The purification of beet or cane sugar by removal of vegetable proteins and salts, followed by decolorization and crystallization of pure sucrose World output in the season 1940/1

beet sugar 10,500,000 long tons, by Russia > Austria + Germany > U S A > Italy > U K > France, as leading producers,

cane sugar 17,100,000 long tons, from India > Cuba > U S A > Formosa > Hawaii > Porto Rico > Brazil > Australia as leading growers of raw sugar

suint A greasy substance derived from dry perspiration from the wool of sheep it consists of potassium salts of organic acids **s ash** Potassium black A source of potassium salts and fertilizer

sulf-, sulph- A prefix indicating the presence of sulfur (See *thio-*)

sulfa drugs A family of drugs of the sulfonamide type which have a marked bacteriostatic action Used medicinally to enable the immune bodies of the host to combat the invading disease bacteria, *e g*, in tuberculosis, in puerperal sepsis, and to prevent the infection of wounds and burns The more important s drugs are sulfanilamide, m 166, **sulfapyridine**, m 191 (decomp), sulfathiazole, m 201 (decomp), **sulfaguanidine** m 191, **sulfadiazine**, m 251 (decomp) All are soluble in dilute acid or acetone, insoluble in ether

sulfacid (1) A thioacid (2) A sulfonic acid

sulfactol Sodium thiosulfate used in sulfur therapy

sulfadiazine See *sulfa drugs*

sulfadimethylpyrimidine Sulfamethazine

sulfaguanidine See *sulfa drugs*

sulfaldehyde $C_3H_6S = 74.1$ Thioaldehyde, thioacetaldehyde, $Me\,CS\,H$ An oily liquid, used medicinally as a hypnotic

sulfamethazine Sulfadimethyl pyrimidine, sulfathiazine A sulfa drug q v

sulfamic The trivalent radical, $=N\,SO_2-$ **s acid** Sulphonamic acid, sulfamidic acid An organic acid of the general type, $R\,N\,SO_2\,OH$

sulfamide $SO_2(NH_2)_2 = 96.18$ The diamide of sulfuric acid A solid, soluble in water or alcohol, m 92, decomp 250 Cf *sulfaminic acid* **alkyl-** An organic compound of the type, $R_2N\,SO_2\,NR_2$

sulfamidic acid Sulfamic acid

sulfamidobarbituric acid Thionuric acid

sulfamine Sulfonamide The monovalent radical, $—SO_2NH_2$ Cf *sulfa drugs*

sulfaminic acid $NH_2\,SO_2OH = 97.10$ Amidosulfonic acid The monoamide of sulfuric acid

SUGARS

	$[\alpha]_D^{20}$		
1 Monosaccharides			$C_4H_8O_4$
1a	TETROSES	erythrose	} from pentoses
		threose	}
1b	PENTOSES		$C_5H_{10}O_5$
	−105 0*m*	arabinose	from gum arabic, cherry gum, beet roots
	18 8	ribose	from nucleic acids
	48 78	cyclose	
		xylose	from wood, corn cobs, straw, jute etc
		lyxose	from xylonic acids
1c	METHYLPENTOSES		$C_6H_{12}O_5$
	−77	fucose	from seaweeds
	−71 7	styracitol	
	19 5	rhamnose	from glucosides (quercitrin)
	74 5	rhodeose	
1d	HEXOSES		$C_6H_{12}O_6$
	A Aldoses		
	14 36	mannose	from orange peels, Brazil nuts, glucosides, etc
	19 8	cocaose	from coca nut
	52 50*m*	glucose (dextrose)	from sweet fruits, honey, etc
	80 8	galactose	from galactans, lactose, glucosides
		gulose	from oxidation and reduction of glucose
	B Ketoses		
	−90 9	fructose (levulose)	from sweet fruits
	42 9	sorbose	from mountain ash
1e	METHYLHEXOSES		$C_7H_{14}O_6$
	−61 4*m*	rhamnohexose	
1f	HEPTOSES		$C_7H_{14}O_7$
	−25*m*	α-glucoheptose	
	−12 2	β-glucoheptose	
	−54 5	β-galaheptose	
	29 37	perseulose	
	68 64	mannoheptose	
1g	METHYLHEPTOSES		$C_8H_{16}O_7$
	8 4	rhamnoheptose	
1h	OCTOSES		$C_8H_{16}O_8$
		αα-gluco-octose	
	−93	αα-gluco-octose (α-form)	
	−28	αα-gluco-octose (β-form)	
1i	NONOSES		$C_9H_{18}O_9$
	13 5	ααα-glucononose	
1j	DECOSES		$C_{10}H_{20}O_{10}$
	50 4*m*	glucodecose	
2 Disaccharides			
2a	(Pentose-hexose)		$C_{11}H_{20}O_{10}$
	39 72*m*	vicianose	from vetch
		primeverose	from cowslip
2b	(Methylpentose-hexose)		$C_{11}H_{20}O_{10}$
		strophanthobiose	from strophanthus
2c	(Hexose-hexose)		$C_{12}H_{22}O_{12}$
	9 6	gentiobiose *aa r*	from starch gentianose
	52 4*m*	lactose *ab r*	from milk
	34 6	cellobiose *aa r*	from cellulose
	66 40	sucrose *ac n*	from sugar beet, sugar cane, sugar maple, jaggery, toddy palm, sorghum, etc
	91 5	reveitose *aa r*	synthetic from glucose
	138 17	maltose *aa r*	from barley, soja beans, etc
	143	melibiose *ab r*	from Australian manna, raffinose
	197	trehalose	from yeast, fungi, mushrooms, manna
3 Trisaccharides			
3a	(2 Methylpentoses-hexoses)		$C_{18}H_{34}O_{14}$
	−41	rhamninose *add r*	from glucosides
3b	(3 Hexoses)		$C_{18}H_{22}O_{16}$
	−31	gentianose *aac n*	from gentian root
		mannotriose *abb*	from manna
		melicitose *aac*	from manna
	123	raffinose *abc n*	from sugar beet, cottonseed cake, manna, etc
		procellose *aaa*	from cellulose

4 Tetrasaccharides

4a (4 hexoses) $C_{24}H_{42}O_{21}$

148 stachyose *abbc n* from the root of Stachys tuberifera

$[\alpha]_D^{20}$ All figures without minus sign are dextro-rotatory

m indicates mutarotation of freshly prepared solutions

r indicates reduction of Fehling's solution

n indicates non-reduction of Fehling's solution

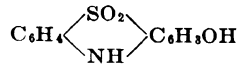
The products of hydrolysis are indicated by *a* = d-glucose, *b* = d-galactose, *c* = d-fructose *d* = rhamnose

(cf *sulfamide*) Colorless crystals, soluble in water **alkyl-** An organic compound of the type, $R_2N\,SO_2\,OR$

sulfamino The monovalent radical, HO_3SNH- or $-NHSO_2\,OH$, derived from sulfaminic acid

sulfaminobenzoic acid $C_7H_7O_4NS$ = 201 2. o-Sulfaminebenzoic acid, $NH_2SO_2\,C_6H_4\,COOH$ Colorless rhombohedral crystals, m 165, soluble in water, alcohol or ether, used in organic synthesis

sulfaminol $C_{12}H_9O_3NS$ = 247 15 Thiooxydiphenylamine,



A greenish-yellow powder, m 155, insoluble in water, soluble in alkalis and carbonate solutions Used medicinally as an antiseptic dusting powder

sulfamthiazine Sulfamethazine

sulfamyl The monovalent radical, $NH_2\,SO_2-$

sulfanilate A salt of sulfanilic acid

sulfanilamide See *sulfa drugs*

sulfanilic acid $C_6H_7O_3NS$ = 173 17 Sulphanilic acid, *p*-aniline sulfonic acid, p-aminobenzenesulfonic acid, $NH_2\,C_6H_4\,SO_3H$ Colorless, efflorescent, rhombic crystals, decomp 280, soluble in water, alcohol or ether Used as a reagent (Ehrlich's diazo reaction), for detecting nitrous acid and bile pigments, in microscopy, in organic synthesis, and in the manufacture of azo dyes

sulfantimonate A salt of the general type, M_3SbS_4, obtained by dissolving antimonic sulfide in ammonium sulfide **sodium-** *Schlippe's salt*

sulfantimonide A double salt of sulfide and antimonide, as CuS_2Sb = CuS SbS

sulfantimonite A salt of the general type, M_3SbS_3, obtained by dissolving antimonous sulfide in ammonium sulfide

sulfapyridine 2-p-Amino benzene sulphonamido pyridine, used in the treatment of meningitis Cf *sulfa drugs*

sulfarsenate A salt of the general type, M_3AsS_4, derived from the hypothetical sulfarsenic acid, H_3AsS_4

sulfarsenide A double salt of sulfide and arsenide, as, $FeAsS_2$

sulfarsenite A salt of the general type, M_3AsS_3, derived from the hypothetical sulfarsenous acid, H_3AsS_3

sulfarsphenamine A compound similar to arsphenamine, less irritating but less efficient therapeutically

sulfate A salt of sulfuric acid of the general type, M_2SO_4 **acid-** A salt of the type, $MHSO_4$, as, $NaHSO_4$ **basic-** Subsulfate, or a salt of the type, $M(OH)SO_4$ **bi-** Acid **hydrogen-** Acids **hypo-** A salt of the type $M_2S_2O_6$, dithionate **neutral-** Sulfate **normal-** Sulfate **pyro-** A salt of the type, $M_2S_2O_7$ **thio-** A salt of the type, $M_2S_2O_3$, thionate

s ion The divalent anion, SO_4^{--} **s of lime** Calcium sulfate **s of potash** Potassium sulfate **s pulp** Paper pulp obtained by digestion of wood in a solution of sodium sulphide containing some sodium hydroxide, sulphate, and carbonate

sulfathiazole See *sulfa drugs*

sulfatide One of a class of lipoid substances containing sulfuric acid esters

sulfatostannate An organic compound of the type, $R_2H_2Sn(SO_4)_3$ Cf *sulfostannate*

sulfazide An organic compound of the type, $R{-}NH\,NH\,SO_2{-}R$

sulfhydrate Hydrosulfide

sulfhydryl Mercapto The monovalent radical, $-SH$

sulfidal Colloidal sulfur

sulfide A binary compound of divalent sulfur, as, M_2S or, R_2S, where M is a monovalent metal or R a monovalent organic radical The latter are named like the ethers, *thio-** replacing *oxy-**, as methylthioethane*, MeSEt **alkyl-** Thioethers Compounds of the type, $R{-}S{-}R$ **di-** Compounds of the type, M_2S_2, or, R_2S_2 **s dyes** A dye that is used in a sodium sulfide bath **s ion** The divalent ion, S^{--} **s sulfur** The divalent, negative, sulfur atom in sulfides, as distinguished from tetra- or hexavalent, positive sulfur

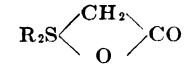
sulfidion See *sulfide ion*

sulfime A compound having a $=C\,N\,S-$ group, as $R\,CH(\,NSH)$ Cf *oxime*

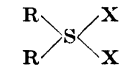
sulfilimine A compound of the general type, $R_2S\,NH$

sulfimide (1) A compound containing the divalent $-SO_2\,NH-$ radical (2) $(SO_2NH)_3$ = 239 7 An imide of sulfuric acid

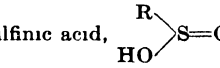
sulfinate (1) Thetines A group of organic compounds of the general type,



(2) A compound having the grouping



(3) A salt of sulfinic acid,



sulfindigotic acid $C_8H_5NOSO_3$ = 211 11 A compound obtained by the action of sulfuric acid on indigo (Cf *thioindigo*)

sulfine Sulfonium compound An organic compound of the type, R_3SX (see *sulfonium*)

sulfinic acid An organic compound of the type, $R{-}SO\,OH$, as, ethanesulfinic acid*, $EtSO_2H$, naphthalenedisulfinic acid*, $C_{10}H_6(SO_2H)_2$ In derivatives it becomes the prefix sulfino-*

sulfinid Saccharin

sulfino* The monovalent radical, $-SO_2H$ Cf *sulfinic acid*

sulfinoxide. An organic compound of the type, $R_3S.OH$.

sulfinyl. The divalent radical, =SO.

sulfion. Sulfide ion, S^{--}.

sulfite. Any salt of sulfurous acid of the general type, M_2SO_3. **acid-** A salt of the type, $MHSO_3$. **bi-** Acid sulfite. **hydrogen-** Acid-. **hypo-** (1) A salt of the type $M_2S_2O_4$. (2) Thiosulfate. **sub-** Thiosulfate.

s. ion. The divalent anion, SO_3^{--}. **s. cellulose liquor.** The waste liquor obtained after the pulping of wood by the sulfite process. It contains 2–4 % free SO_2, 2–7 % SO_3^{--}, 2–5 % SO_4^{--}, 80–90 % solids and 12–16 % ash, with calcium compounds, carbohydrates and lignone sulfonate. It is used as a tanning, binding, or mordanting agent, or for fermentation. **s.c.l. lactone.** Tsugaresinol. **s. pulp.** A paper pulp obtained by the digestion of wood (generally coniferous wood) with calcium bisulfite containing free SO_2.

sulfo- sulpho- A prefix, generally indicating the presence of (1) divalent sulfur, or (2) the sulfo-group, $—SO_3H$. Cf. *thio-*. **s. acid.** Sulfonic acid. **s. group.** The monovalent $—SO_3H$ group. (See *sulfonic acids.*) **s. salt.** (1) A salt of an acid containing sulfur. (2) An ester of sulfonic acid.

sulfoacetic acid. $C_2H_4O_5S$ = 140.10. $HSO_3.CH_2.COOH,H_2O$. Colorless tablets, m.86, subliming on further heating, soluble in water, alcohol or ether.

sulfoarsenide. Sulfarsenide.

sulfobenzide. $C_{12}H_{10}O_2S$ = 218.2. Diphenylsulfone, Ph_2SO_2. Colorless scales, m.123; insoluble in water, slightly soluble in alcohol or ether.

sulfobenzoic acid. $C_7H_6O_5S$ = 202.12. $HSO_3.C_6H_4.COOH$. **ortho-** Colorless triclinic crystals, m.134, forming an anhydride when heated above 125°C; soluble in water or alcohol. **meta-** Colorless crystals, m.141; soluble in water or ether. **para-** Colorless needles, m.260, soluble in water, alcohol or ether; used in organic synthesis. Cf. *halazone.*

sulfocarbamide. Thiourea.

sulfocarbanilide. $C_{13}H_{12}N_2S$ = 228.24. Thiocarbanilide, diphenylsulfourea, diphenylthiourea, Ph.NH.CS.NH.Ph. Colorless crystalline leaflets, d.1.303, m.153, insoluble in water, soluble in alcohol or ether; used in organic synthesis.

sulfocarbazide. A compound containing the divalent —NH.NH.CS.NH.NH— radical.

sulfocarbimide. Isothiocyanic acid.

sulfocarbodiazone. A compound containing the divalent —N:N.CS.N:N— radical.

sulfocarbolate. Phenol sulfonate. A salt of phenolsulfonic acid.

sulfocarbolic acid. Phenolsulfonic acid.

sulfocarbonate. Any salt of the general type, M_2CS_3, derived from sulfocarbonic acid.

sulfocarbonic acid. H_2CS_3 = 110.2. Thiocarbonic acid, trithiocarbonic acid. A brown oil, insoluble in water and readily decomposed. Its potassium salt is a reagent for nickel.

sulfochloride. The chloride of sulfonic acids of the general type $R.SO_2.Cl$.

sulfocyan. Thiocyanate.

sulfocyanate. Thiocyanate.

sulfocyanic acid. Thiocyanic acid

sulfocyanide. Thiocyanate.

sulfoform. $C_{18}H_{15}SbS$ = 384.8. Triphenylstibine sulfide, Ph_3SbS. Colorless needles, m.120, used in skin diseases. *crude-* A yellow liquid; a powerful reducing agent. It reduces sulfuric acid to sulfurous acid, and antimonic oxide to antimonous oxide.

sulfo-group. The monovalent $—SO_3H$ group (see *sulfonic acid*).

sulfoguaiacin. Quinine methyl sulfoguaiacate.

sulfohydrate. Hydrosulfide.

sulfoichthyolic acid. One of a number of compounds obtained from bituminous shales, which contain sulfur as sulfonate, sulfone or sulfide.

sulfoid. Colloidal sulfur.

sulfoleate. A salt of sulfoleic acid.

sulfoleic acid. A compound obtained by mixing sulfuric acid with oils containing oleic acid.

sulfolipins. Fatty substances containing sulfur.

sulfonal. $C_7H_{16}O_4S_2$ = 228.3. Sulphonal, sulfonmethane, diethylsulfone-dimethylmethane, $Me_2C(SO_2Et)_2$. Colorless prisms, m.126 decomp. 300, slightly soluble in water, soluble in alcohol or ether: used medicinally as a hypnotic. **methyl-** Trional.

sulfonamic. Sulfamic.

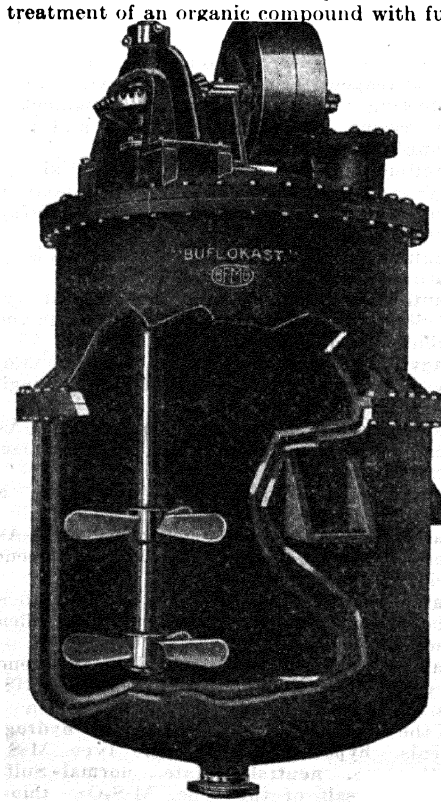
sulfonamide. Sulfamine.

sulfonamido. The bivalent radical, $—NH.SO_2—$. Cf. *sulfamino, sulfamyl.*

sulfonaphthol. $C_{10}H_8O_4S$ = 224.13. $HSO_3.C_{10}H_6.OH$. A colorless powder; used medicinally as an antiseptic, also in organic synthesis.

sulfonate. (1) To treat an aromatic hydrocarbon with fuming sulfuric acid. (2) A sulfuric acid derivative. (3) The ester of a sulfonic acid.

sulfonation. The substitution of one or more H by one or more $—SO_3H$ groups. **direct-** The treatment of an organic compound with fuming



Sulfonator.

sulfuric acid **indirect-** Treatment with acid sulfites or other salts

sulfonator A double-walled cast iron vessel with power-driven stirring device, used for large-scale sulfonation See illustration

sulfone An organic compound of the type, R_2SO_2, or, RSOOR, obtained by oxidation of sulfides In derivatives its prefix is sulfonyl*, as ethyl sulfone*, Et_2SO_2, methylsulfonyl ethane* $EtSO_2Me$ **s methanes** A group of compounds used medicinally to produce sleep

sulfonal, diethylsulfonedimethylmethane, $Me_2C(SO_2Et)_2$

trional, diethylsulfonemethylethylmethane, $MeEtC(SO_2Et)_2$

tetronal diethylsulfonediethylmethane, $Et_2C(SO_2Et)_2$

s phthalein See *sulfonphthalein*

sulfonethylmethane Trional

sulfonic acid* An organic compound containing the monovalent —SO_2OH or —SO_3H radical They are derived from sulfuric acid by the replacement of an —OH group, usually obtained by treatment of aromatic hydrocarbons with conc sulfuric acid They are soluble in water, and yield phenols when heated with solid KOH Many sulfonic acids are used in organic synthesis, and in the manufacture of dyes and synthetic drugs The more common dyestuff intermediates and their trade names are

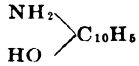
Monosulfonic acids

$HO\,C_{10}H_6\,SO_2OH$

1-naphthol-4-sulfonic acid	NW acid
1-naphthol-5-sulfonic acid	L acid
2-naphthol-6-sulfonic acid	Schaffer's acid
2-naphthol-7-sulfonic acid	F acid
2-naphthol-8-sulfonic acid	Bayer's acid

$NH\,C_{10}H_6\,SO_2OH$

1-naphthylamine-2-sulfonic acid	o-naphthionic
1-naphthylamine-3-sulfonic acid	Cleve's acid
1-naphthylamine-4-sulfonic acid	naphthionic acid
1-naphthylamine-5-sulfonic acid	Laurent's acid
1-naphthylamine-6-sulfonic acid	Cleve's acid
1-naphthylamine-8-sulfonic acid	peri acid
2-naphthylamine-1-sulfonic acid	Tobias acid
2-naphthylamine-5-sulfonic acid	Dahl's acid
2-naphthylamine-6-sulfonic acid	Bronner's acid
2-naphthylamine-8-sulfonic acid	Badische acid

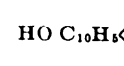


1-amino-5-naphthol-7-sulfonic acid	M acid
1-amino-8-naphthol-4-sulfonic acid	S acid
1-amino-8-naphthol-6-sulfonic acid	γ acid
2-amino-5-naphthol-7-sulfonic acid	J acid

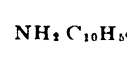
Disulfonic acids

$C_{10}H_6(SO_3OH)$

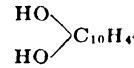
naphthalene-1 5-disulfonic acid	Armstrong's acid
naphthalene-1 6-disulfonic acid	Ewer & Pick's acid
naphthalene-2 5-disulfonic acid	Ebert & Merz's acid



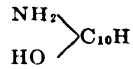
1-naphthol-3 6-disulfonic acid	RG acid
1-naphthol-3 8-disulfonic acid	Andresen's acid
1-naphthol-4 8-disulfonic acid	δ acid
2-naphthol-3 6-disulfonic acid	R acid
2-naphthol-6 8-disulfonic acid	G acid



1-naphthylamine-2 7-disulfonic acid	Kalle's acid
1-naphthylamine-3 6-disulfonic acid	Freund's acid
1-naphthylamine-3 8-disulfonic acid	ε acid
1-naphthylamine-4 6-disulfonic acid	Dahl II acid
1-naphthylamine-4 7-disulfonic acid	Dahl III acid
1-naphthylamine-4 8-disulfonic acid	Disulfo acid
2-naphthylamine-3 6-disulfonic acid	amino R acid
2-naphthylamine-6 8-disulfonic acid	amino G acid



1 3-dihydroxynaphthalene-5 7-disulfonic acid	yellow acid
1 5-dihydroxynaphthalene-3 7-disulfonic acid	red acid
1 7-dihydroxynaphthalene-3 6-disulfonic acid	R acid
1 8-dihydroxynaphthalene-3 6-disulfonic acid	chromotropic acid



1-amino-8-naphthol-2 4-disulfonic acid	2 S acid
1-amino-8-naphthol-3 6-disulfonic acid	H acid
1-amino-8-naphthol-4 6-disulfonic acid	K acid
2-amino-8-naphthol-3 6-disulfonic acid	2R acid

Trisulfonic acids

$NH_2\,C_{10}H_4(SO_2OH)_2$

1-naphthylamine-3 6 8-trisulfonic acid	Koch's acid

amino- Sulfamic acid **diamino-** Sulfamide **nitro-** Nitrosylsulfate

sulfonium Sulfine The monovalent, electropositive radical, R_3S— **s compound** Sulfine An organic compound of the type, R_3SX, in which R is an organic radical, and X

an electronegative element (Br, Cl, I) or radical (OH) **s hydroxide** An organic compound of the type, $R_3S\,OH$ They are strong bases and ionize to R_3S^+ and OH^- **s iodide** An organic compound of the type, R_3SI

sulfonmethane Sulfonal

sulfonaphthalein A group of compounds similar in constitution to the phthaleins, but having a sulfone, instead of a carbonyl group Made by condensation of *o*-sulfobenzoic acid anhydride with phenols Many are important indicators (q v) and dyes

m-cresol-	cresol purple
o-cresol-	cresol red
dibromo-*o*-cresol-	brom cresol purple
dibromophenol-	brom phenol red
dibromothymol-	brom thymol blue
dichlorophenol-	chlor phenol red
phenol-	phenol red
tetrabromo-*m*-cresol-	brom cresol green
tetrabromophenol-	brom phenol blue
tetrachloro-*m*-cresol-	chlor cresol green
thymol-	thymol blue

sulfonyl Sulfuryl The bivalent radical $—SO_2—$

sulfoparaldehyde $(C_4H_8S_2)_3 = 448\ 5$ Trithioacetaldehyde A colorless crystalline powder insoluble in water, soluble in alcohol or ether, used medicinally as a hypnotic

sulfophenol Aseptol

sulfophenylate (1) Phenolsulfonate (2) Phenylsulfate

sulforhodanide Thiocyanate

sulfosalicylic acid $C_6H_3(OH)\,(COOH)\,SO_3H = 218\ 1$ A soluble, solid sulfonic acid derivative of salicylic acid m 120 used as reagent for albumin

sulfo-salt (1) A salt of an acid which contains sulfur (2) An ester of sulfonic acid

sulfoselenide A double salt of the type M_4SSe

sulfosemicarbazide A compound containing the monovalent $NH_2\,CSNH\,NH—$ radical

sulfosol A colloidal system with sulfuric acid as the enclosing or disperse phase

sulfostannate A compound of the general type, M_2SnS_3, as, Na_2SnS_3 Cf *sulfatostannate*

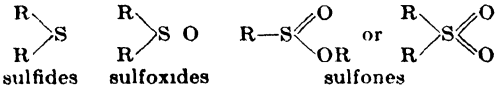
sulfostannite A compound of the general type, M_2SnS_2

sulfo-urea Thiourea

sulfovinic acid Ethyl sulfuric acid

sulfoxide The divalent radical, $=SO$

sulfoxides* A group of organic compounds of the general type, R_2SO or, $R\,SO\,R$ In derivatives they have the prefix sulfinyl* as, methylsulfoxide*, Me_2SO, methylsulfinylethane*, $MeSOEt$ They are obtained by oxidation of mercaptans and are intermediate between the sulfides and sulfones and analogous to the ketones



sulfoxylate A salt of the type, $M\,SO_2$, or, $MHSO_2$, derived from sulfoxylic acid

sulfoxylic acid The hypothetical acid, $S(OH)_2$, containing bivalent sulfur It is known in the form of its salts, Na_2SO_2, and, $NaHSO_2$ (see *rongalite*)

sulfur, sulphur [sulfur is the spelling adopted by The American Chemical Society, and the Pharmacopoeia of the United States XII] S = 32 06 Brimstone A solid non-metal and element, atomic number 16 Sulfur occurs as a yellow, brittle mass or in transparent monoclinic or rhombic crystals and exists in a number of modifications The more important are (1) rhombic sulfur, $S_8 = 256\ 4$ Stable at ordinary temperatures, d 2 07, m 114, b 444 7 (2) monoclinic sulfur, $S_8 = 256\ 4$ Stable above 96°C, and forms transparent yellow, monoclinic prisms, d 1 957, m 119, b 444 7 (3) amorphous sulfur, S_λ A soft, pale-yellow or fine white powder (colloidal), d 2 046, m 120, b 444 7 If sulfur is heated the following changes and modifications are observed

Ordinary temp — rhombic S_8
96°C — monoclinic, S_8
114°C — melts to a thin, yellow liquid S_8 or S_λ
160°C, — forms a thick, brown liquid containing thiozon S_3, besides S_8
220°C , — becomes dark brown and plastic, S_6 and S_8 or $S_{\lambda\mu}$
250°C, — begins to burn if heated in air
440°C, — forms a thin brown liquid, S_6 or S_μ
44 7°C, — boils and forms a reddish-brown vapor of S_6 which, when further heated, becomes lighter in color and larger in volume until, at
860°C, — it forms a colorless vapor of S , d 2 23

Sulfur is found native in Sicily and the United States It is insoluble in water, slightly soluble in alcohol or ether, soluble in carbon disulfide The solubility varies with the modification Used in the manufacture of gun-powder, matches, disinfectants, vulcanizing materials, sulfuric acid sulfides and pharmaceuticals It forms several series of compounds (see *sulfur compounds*) **colloidal-** Sulfidal, sulfoid Finely-divided sulfur obtained by passing hydrogen sulfide through a solution of a sulfite used medicinally for skin diseases **flowers of-** Sublimed sulfur **lac-** Precipitated sulfur obtained by adding sulfuric acid to a solution of a polysulfide It contains up to 45 % calcium sulfate, used in pharmacy **liver of-** A mixture of potassium sulfide and polysulfides **milk of-** Precipitated sulfur **precipitated-** Milk of sulfur A suspension of finely-divided sulfur obtained by precipitation of calcium pentasulfide or a thiosulfate by an acid **ruby-** Realgar **sublimed-** A fine yellow powder obtained by distilling sulfur **vegetable-** Lycopodium **washed-** Sulfur washed with ammonium hydroxide and water, used medicinally

s acids See *sulfuric acids* **s alcohols** Hydrosulfides **s bromide** $S_2Br_2 = 224\ 0$ Sulfur monobromide A yellow liquid, d 2 628 soluble in carbon disulfide **s chlorides** (1) $S_2Cl_2 = 135\ 0$ Sulfur monochloride A brown fuming liquid, d 1 709, m −80, b 138, decomp by water, soluble in carbon disulfide, alcohol or ether Used as a reagent, and industrially in vulcanizing rubber, in organic synthesis, for sulfur solvents, war gases, vulcanized oils, also in the purification of sugar (2) SCl_2 Sulfur dichloride (3) $S_2Cl_4 = 238\ 02$ Trisulfur tetrachloride (4) SCl_4 Sulfur tetrachloride **red-** A reddish-brown liquid d 1 6–1 65, composed of 75 % SCl_2 and 25 % S_2Cl , used in the manufacture of varnishes, rubber pigments, poison gas and for synthesis **yellow-** A yellowish, corrosive liquid, d 1 70, containing 5–9 % free sulfur, used similarly to red s **s compounds** Sulfur has a valency of two four

or six, and accordingly, forms the following four series of compounds

A Valence number, −2

Hydrogen sulfide	H_2S
Hydrosulfides (thiols*, RSH)	MSH
Sulfides (thioethers, R_2S) (see *thio compounds*)	M_2S

B Valence number, 2

Sulfur dichloride	SCl_2
Sulfoxylic acid	$S(OH)_2$

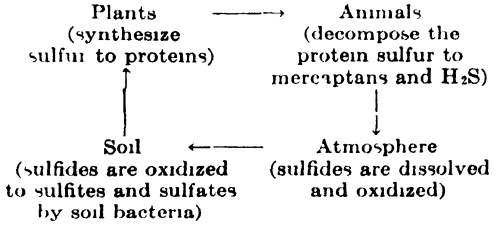
C Valence number 4

Sulfur dioxide	$O=S=O$
Sulfurous acid	$HO\diagdown \atop HO\diagup S=O$
Sulfites	$MO\diagdown \atop MO\diagup S=O$
Sulfinic acids	$R\diagdown \atop HO\diagup S=O$
Sulfones	$R\diagdown \atop RO\diagup S=O$
Sulfoxides	$R\diagdown \atop R\diagup S=O$
Sulfonium	$R\diagdown \atop R\diagup S\diagup R$
Sulfinates	$R\diagdown \atop R\diagup S\diagup X$

D Valence number 6

Sulfur trioxide	$O=S(=O)=O$
Sulfuric acid	$HO\diagdown \atop HO\diagup S(=O)=O$
Sulfates	$MO\diagdown \atop MO\diagup S(=O)=O$
Sulfonic acids	$R\diagdown \atop HO\diagup S(=O)=O$
Sulfones	$R\diagdown \atop R\diagup S(=O)=O$

s cycle The transformation of sulfur compounds by living organisms in relationship to surrounding nature



s dichloride SCl_2 = 103 1 A reddish-brown liquid d 1 622, m −78, b 69, decomp by water or heat Used in the rubber industry for vulcanizing, for purifying sugar juices, and as a sulfur solvent It has been stated to be a mixture of the mono- and tetrachloride **s dioxide** SO_2 = 64 1 Sulfurous acid anhydride A liquid, d 0°1 434, or colorless gas, m −73, b −10, soluble in water, alcohol or ether It is marketed in small iron tanks and is used as a reagent, in bleaching and as a preservative **s dyes** Pyrogenic dyes A group of organic dyes containing sulfur, obtained by heating amino- or nitro-compounds with alkali sulfides They are insoluble in water, but soluble in sodium sulfide solutions used as permanent dyes for cotton, wool or silk **s ether** An organic compound of the type, R_2S See *thioethers* **s fluorescein** Uranin **S fluoride** S_2F_2 = 102 1 Sulfur monofluoride A colorless gas, readily hydrolyzed to HF, SO_2 and S **s group** The sixth group of the periodic system, which consists of the elements sulfur selenium, tellurium and oxygen **s hexafluoride** SF_6 = 146 06 A white solid, insoluble in water, slightly soluble in alcohol or ether, m −55, b −50 **s hexaiodide** SI_6 = 793 8 Green crystals, soluble in carbon disulfide decomp by water **s introfier** See *introfier* **s iodide** S_2I_2 = 317 8 Iodine disulfide, sulfur subiodide A grayish-black, brittle, crystalline mass of metallic luster insoluble in water, soluble in glycerol or carbon disulfide used medicinally in ointments for skin diseases **s monobromide** S bromide **s monochloride** S chloride **s monofluoride** S fluoride **s oxides** See *s dioxide s trioxide* **s oxychlorides** (1) SO_2Cl_4 = 205 96 A red liquid d 1 656 b 100 decomp by water (2) $S_2O_3Cl_4$ = 253 96 White needles m 57 (subliming) They are decomp by water (3) See *sulfuryl chloride* **s oxyfluoride** SO_2F_2 = 134 12 Sulfuryl fluoride An irritating vapor or extremely pungent liquid **s subbromide** S bromide **s subchloride** S chloride **s subiodide** S iodide **s tetrachloride** SCl_4 = 173 9 A yellow liquid or yellow-white solid m −31 It is unstable, but forms stable compounds of the type $2AlCl_3SCl_4$ **s trioxide** SO_3 = 80 1 Sulfuric acid anhydride *solid-* $(SO_3)_2$ Colorless crystalline prisms d 1 982 m 15 b 46, rapidly decomp by water and form sulfuric acid soluble in conc sulfuric acid **s yellow** Naphthol yellow

sulfur acids The following acids of sulfur and their *salts*, are known

H_2S—hydrosulfuric acid or hydrogen sulfide
H_2S_5—hydrogen pentasulfide (H_2SS_4)
H_2SO_3 sulfurous acid, *sulfite*
H_2SO_4 sulfuric acid, *sulfate*
$H_2SO_4 + SO_3$ oleum
$H_2S_2O_3$—thiosulfuric acid, *thiosulfate*
$H_2S_2O_4$—dithionous acid, *hyposulfite, dithionite*
$H_2S_2O_5$—Caro's acid, metasulfuric acid
$H_2S_2O_6$—dithionic acid, *hyposulfate, dithionate*
$H_2S_2O_7$—pyrosulfuric acid, *pyrosulfate*
$H_2S_2O_8$—persulfuric acid, *persulfate*
$H_2S_3O_6$—trithionic acid, *trithionate*
$H_2S_4O_6$—tetrathionic acid, *tetrathionate*
$H_2S_5O_6$—pentathionic acid, *pentathionate*
$H_2S_6O_6$—hexathionic acid, *hexathionate*

s anhydride Sulfur trioxide

sulfurated, sulphuretted Combined with sulfur **s. oil** An essential oil containing sulfur compounds, as, mustard oil

sulfuret A sulfide

sulfuretted hydrogen Hydrogen sulfide

sulfuric Pertaining to hexavalent sulfur **s acid** See *sulfur a , sulfuric acid* **s anhydride** Sulfur trioxide **s chloride.** Sulfuryl chloride

sulfuric acid H_2SO_4 = 98 1 Oil of vitriol, spirit of vitriol, hydrogen sulfate A dibasic acid obtained from sulfur dioxide (see *sulfuric acid manufacture*), and used extensively technically

(1) H_2SO_4 = 98 1, d 1 8542, m 10, b 316
(2) H_2SO_4 H_2O = 116 1 Colorless prisms, d 1 788, m 8, b 210, soluble in water, decomposed by alcohol
(3) H_2SO_4 $2H_2O$ = 134 1 Colorless liquid, d 1 665, m −38, b 170, soluble in water, alcohol or ether
(4) H_2SO_4 xH_2O d 1 84 concentrated acid, 94 %
(5) d 1 826 U S P conc 92 5 %
(6) d 1 067 U S P diluted 10 %
(7) H_2SO_4 xSO_3 oleum (above 100 %)

Cf *sulfamide, sulfaminic acid, sulfur-acids, B O V, D O V, R O V* **chloro-** See *chlorosulfuric acid* **concentrated-** See (4) (5) **dilute-** See (6) **ethyl-** See *ethylsulfuric acid* **fuming-** See (7) **glycerol-** q v **nitro-** q v **nitroso-** q v **Nordhausen-** Oleum **phenol-** Phenylsulfuric acid **s manufacture** Two principal processes (A) Lead chamber process—Sulfur or pyrites is burned in furnaces and the sulfur dioxide formed passes through the Glover tower, where it comes in contact with 65 % sulfuric acid from the lead chamber and the acid containing oxides of nitrogen from the Gay-Lussac tower A portion of the SO_2 is oxidized and dissolved The remaining mixture of gases, consisting now principally of SO_2 and NO passes into the lead chamber, where the principal reaction occurs

$$SO_2 + O_2 + NO \rightarrow SO_3 + NO_2 \rightarrow H_2SO_4(65\ \%)$$

The escaping NO_2 is passed through the Gay-Lussac tower, in which it is dissolved in strong sulfuric acid from the Glover tower The acids collecting at the bottom of the lead chambers are finally concentrated in pans by heat (B) Contact process- Sulfur or pyrites is burned in furnaces and the SO_2 formed passes through scrubbers In some the gas is washed with water, in others it is dried with sulfuric acid The dry gas enters the contact chamber in which a catalyst, (generally platinum or iron oxide) oxidizes it to SO_3 which, in turn, is passed through water and absorbed as sulfuric acid

sulfuric esters Sulfuric acid esters An organic compound of the type, R_2SO_4

sulfuric ether An erroneous name for the ether of commerce, diethylether, Et_2O

sulfuring (1) Burning sulfur in barrels to disinfect them for wines, etc (2) Dressing growing crops with flowers of sulfur to arrest mold growth (3) Adding sulfur to the fires used in hop kilns to liberate SO_2 for its preserving effect

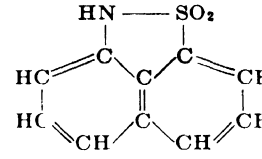
sulfurize To combine with sulfur

sulfurous Pertaining to tetravalent sulfur **s acid** H_2SO_3 = 82 1 $SO(OH)_2$ An aqueous solution of sulfur dioxide, which contains about 6 % SO_2 A clear, colorless liquid, d 1 03, used as a reducing agent and in bleaching textiles *ethyl-* See *ethylsulfurous a* **s anhydride** Sulfur dioxide **s esters** Organic compounds of the type, R_2SO_3

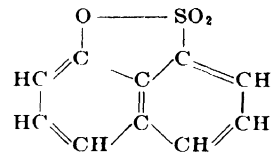
sulfuryl Sulfonyl The divalent radical, $=SO_2$, derived from sulfuric acid by subtraction of two —OH groups **s chloride** SO_2Cl_2 = 135 0 Sulfuric chloride, chlorsulfuric acid A colorless, extremely pungent liquid, $d_{20°}$ 1 66, b 69, decomp by water, used as a reagent and in organic synthesis **s diamide** Sulfamide **s fluoride** Sulfur oxyfluoride

sulph-, sulpho-, sulphur, sulphuretted, sulphuric, etc See *sulf-, sulfo-, sulfur, sulfurated, sulfuric* etc (The American Chemical Society, and the U S P XII prefer the latter spelling)

sultam A derivative of a 1 8-naphthylamine sulfonic acid having the characteristic grouping,



sultone A derivative of 1 8-naphthol-sulfonic acid having the characteristic grouping,



sulvanite Cu_3VS_4 A vanadium mineral

sumach (1) The shrub *Rhus coriaria*, Sicilian s, an Anacardiaceae of Southern Europe, whose leaves are used for tanning and dyeing (2) Any of the *Rhus* species (3) Sumac A tanning material (18–25 % tannin) from the dried leaves of *Rhus* species

Rhus copellina	American s
Rhus coriaria	Sicilian s
Rhus cotinus	Venetian s
Rhus glabra	White s
Rhus metopium	American s
Rhus pentaphylla	Tizra s
Rhus succedania	Indian s

Cf *fustic* **Chinese-** Tree-of-heaven The bark of *Ailanthus glandulosa*, a Simaroubaceae, used as an astringent and antispasmodic, and for tanning **curriers-** The plant *Coriaria myrtifolia*, a Coriariaceae, containing coria myrtin **smooth-** Sumac berries The dried ripe fruit of *R glabra* used as an astringent and tonic **sweet-** Fragrant s The bark of the root of *R aromatica*, used as an astringent and diuretic **s bark** Sweet s **s berries** Smooth s

sumaresinol $C_{30}H_{48}O_4$ $4H_2O$ = 544 35 Sumaresinolic acid A resin acid, m 298 from Sumatra gum benzoin

sumbul Musk-root The dried rhizome of *Ferula sumbul*, an Umbelliferae of Asia Used medicinally as a nerve stimulant and antispasmodic

sump An open channel or pit for collecting dripping liquids in works, factories, etc, prior to removal by pumping

sun The star nearest to the earth, mass 1 99 × 10^{33} grams, d 5 00, luminosity −26 7, surface temperature 6000°C Cf *spectral classification, solar spectrum, earth constants* **s light** Intensity on a clear day = 100,000 to 125 000 lux

SUN'S ATMOSPHERE

	By volume, per cent	By weight, per cent
hydrogen	92	46
helium	3	6
oxygen	3	24
metals	2	24

Metallic vapors in the sun's atmosphere, in tons per square mile

Mg 350	Al 15	V 1 5
Fe 250	Ni 15	Cu 1 5
Si 150	Mn 10	Zn 1 0
Na 100	Co 6	others 0 2
K 50	Cr 6	
Ca 50	Ti 2	Total 1,008

sundew Drosera

sunflower Helianthus The dried seeds of *Helianthus annuus*, a Compositae used medicinally, as the fluid extract as a diuretic **s oil** A slow-drying oil extracted from the seeds of s

sunstone Orthoclase

super- A prefix derived from the Latin which indicates 'above" "beyond" or "higher"

superacid Excessively acid in reaction **s solution** A solution in acetic or phosphoric acid

superacidity An increased acidity of the gastric juice

superbine A poisonous bitter principle from *Gloriosa superba*, a Liliaceae of India and South Africa, which resembles the bitter principle of squill The plant is often used for suicidal purposes

supercalender A calender, (q v) which uses both steam and high pressure to obtain a high finish, *e g* , on paper for illustrations

supercarbonate Bicarbonate

superchlorination A process of sterilizing water by chlorinating in excess, and then adding an antichlor

superconductivity Supraconductivity

supercooled Over- or undercooled Cooled below the freezing-point of a liquid without the separation of solid matter

superheated Overheated Describing a liquid or gas heated above its boiling point in the liquid state, as superheated steam, *i e* , water vapor heated above 100°C

supernatant The liquid standing above a sediment or precipitate

supernickel An alloy of 30 % of nickel and 70 % of copper It retains its strength at high temperatures better than most copper alloys

supernormal A volumetric solution of greater concentration than normal, as, 2N-solution

superol o-Hydroxy quinoline sulfate

superoxide Peroxide

superpalite A poison gas, cf *palite*

superphosphate (1) An acid phosphate (2) A mixture of calcium phosphate and calcium sulfate obtained by the action of conc sulfuric acid on phosphate minerals (apatite, phosphorite), used as fertilizer **ammoniated-** A fertilizer containing s or dissolved bone or both, but no potash **double-** A fertilizer made by the action of phosphoric acid on rock phosphate, it contains 40–50 % P_2O_5

superpolymer A polymer whose molecular weight is 10 000 or more

superpotential Overvoltage

supersaturate To more than saturate

supersaturated solution A solution that contains an excess of dissolved substance over the amount normally required for saturation at a particular temperature, but which still holds it all in solution, usually obtained by slowly cooling a saturated solution

supersaturation Containing an abnormally high proportion of solute

supersolubility Supersaturation **s curve** The curve obtained by plotting the concentration of a supersaturated solution against the temperature It is analogous to and parallel with the solubility curve q v

supersonic Ultraphonic

supersteel A high-speed steel, q v

supertension Overvoltage

support A device for holding an apparatus or vessel in position

suppurative An agent that produces pus

supra- A prefix derived from the Latin, and indicating "above "

supracapsuline Adrenalin

supraconductivity The property of certain metals of becoming good conductors of electricity near the absolute zero The temperature at which this takes place is 7 2°K for Pb, 4 21°K for Hg, 3 71°K for Sn 3 41°K for In, and 2 47°K for Tl No other metal shows any change above 1 3°K the temperature limit of present methods

suprarenal A gland located above the kidney **s liquid** An aqueous extract of the suprarenal gland, used medicinally

suprarenalin Adrenalin

suprarenin The acid tartrate of synthetic epinephrine (adrenalin) A white odorless powder, m 211, insoluble in water, used medicinally

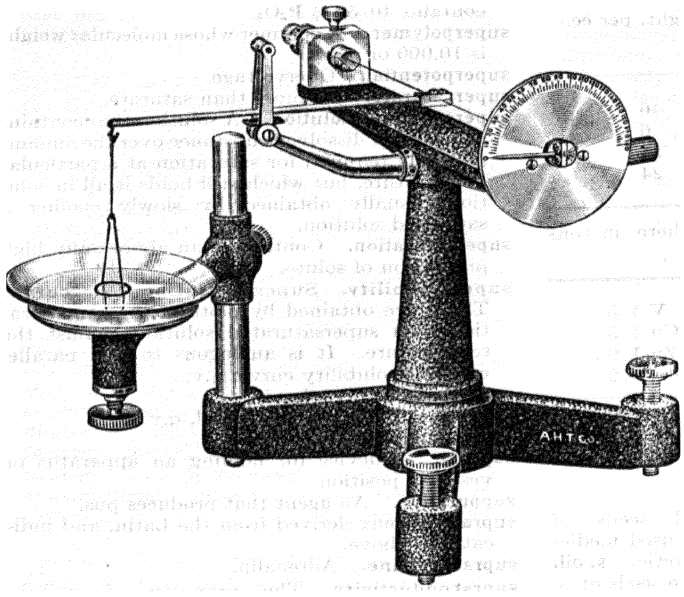
suprasterols A group of sterols produced by irradiation of lumisterol Cf *cholane derivatives*

suramin Bayer 205

surcharge The sum of the errors involved in an assay, which is often included in the assay report

surface The outer part of a body A magnitude that has length and breadth but not thickness **s density** The electric or magnetic charge per unit area located on the surface of an electrode or other body See *current density* **s energy** The product obtained by multiplying surface tension by the two-thirds power of the molecular weight and specific volume **s tension** The contractile surface force of a liquid by which it tends to assume a spherical form and to present the least possible surface (*e g* the formation of a meniscus) It may also be exerted at the junction of two liquids It is measured directly (g per cm ^{2} or dynes), or indirectly by determining the capillarity Increase in temperature or the addition of certain substances lowers the surface tension The s t (at const temp), γ, is in a constant ratio to the fourth power of the orthobaric densities of liquid D, and gas, d, hence $\gamma^{\frac{1}{4}} = K(D - d)$ Cf *parachor* **s tension apparatus** Tensiometer A device for determining the surface tension, based upon the flexibility

of a wire (accurate within 0.1 dyne). See illustration. **s. t. 37.** See under *S.*



Surface tension apparatus.

surfusion. The unstable condition of a liquid cooled below its freezing point without solidifying. Cf. *supercooled.*

surpalite. Diphosgene.

surrogate. A substance used as a substitute for another substance; as, margarine for butter.

surrosion. The increase in weight of a substance owing to corrosion.

susceptible. (1) Sensitive. Readily capable of responding to an action or force; as, magnetic susceptibility. (2) See *immune.*

susotoxin. $C_{16}H_{28}N_2$ = 174.3. Sustoxin. A ptomaine from cultures of hog-cholera bacillus.

suspension. (1) Suspensoid. (2) A thin thread of steel, phosphor-bronze or other substance, on which the mirror and magnet of a galvanometer hang. **s. method.** The determination of the density of minerals or powders by placing them in a solution of known density; as, Rohrbach's, Thiel and Stohl's, or Thoulet's solution.

suspensoid. Suspension, soliquoid. Finely-divided, colloidal particles floating in a liquid; the particles are so small that they do not settle, but are kept in motion by the moving molecules of the liquid (Brownian motion, q.v.).

sussexite. A native, hydrated magnesium manganese pyroborate.

sustoxin. Susotoxin.

Sutherland's equation. The diameter of a molecule, D, is determined by

$$D = [1.402/\sqrt{2}\,\pi NL(1 + C/T)]^{\frac{1}{2}}$$

ere N is the number of molecules per unit volume, L the mean free path (cm.), and C is Sutherland's constant. **S.-Einstein equation:** $D = \frac{RT}{Nf}$, where D is the diffusion constant, R the gas constant, T the absolute temperature, N Avogadro's constant and f the frictional force in dynes on each molecule having unit velocity.

Sved. A unit of sedimentation rate.

Svedberg, The(odor). 1884– . A Swedish physical chemist, noted for research on colloids and Nobel prize winner (1926). **S.'s. equation.** The amplitude, A, of Brownian movement of a particle is proportional to its vibration period, t. Thus: A = kt, where k is a constant.

swage. To fashion metal, particularly iron, by drawing it into a groove, mold or die having the desired shape.

Swain, Robert Eckles. 1875– . An American chemist noted for research in physiological chemistry.

Swan, Sir Joseph Wilson. 1828–1914. An English chemist, noted as pioneer in photographic processes, electric carbon filament lamps and electrodeposition of metals.

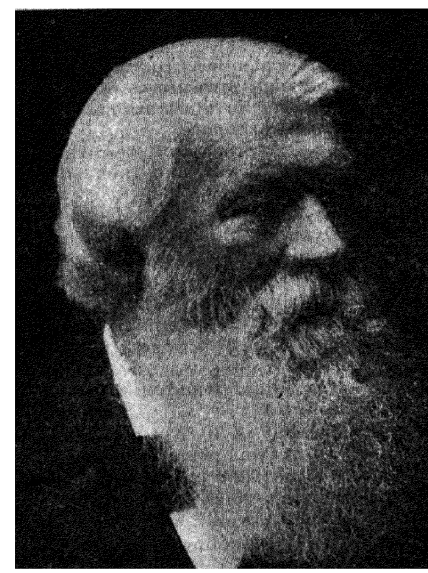
swan neck. A tube bent into the shape of an upright U-tube joined to an inverted U-tube; thus S.

swarf. The raw edge of a metallic object produced in casting metals, and removed for re-use.

Swarts, Frederic. A Dutch chemist noted for organic research.

Swedenborg, Emanuel. 1688–1772. A Swedish mineralogist and later, theosophist, who invented the mercury pumps and wrote books on chemistry.

sweet flag. Calamus.



Joseph Wilson Swan.

sweeten. (1) To remove substances of unpleasant odor (as mercaptans) from spirits, petroleum, etc., usually by oxidation. (2) To purify. (3) To add a sugar.

sweetness The taste of sugars The relative physiological response has been determined by the University of Minnesota as follows

fructose	175
invert sugar	123
sucrose	100
glucose	74
xylose	40
maltose	32
rhamnose	32
galactose	32
raffinose	23
lactose	16
For synthetic agents *estimated* as	
peryllartine	2000
saccharin	700
sucrol	300

Cf *dulcigen, sapiphore*

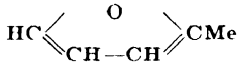
swelling The adsorption of water by an amorphous substance, with the formation of a jelly It is assumed to be due to a chemical reaction with water, distinct from hydrolysis, and the formation of a zone (q v) of oriented molecules

sycoceryl alcohol $C_{18}H_{30}O$ = 262 23 Colorless crystals, m 90 Cf *lactucerol*

syenite A granular igneous rock which consists chiefly of orthoclase with or without albite, biotite hornblende microcline or corundum

sykose A brand of saccharin

sylvan C_5H_6O = 82 1 α-Methylfuran,



A constituent of wood-tar A yellowish liquid, d 0 916, b 63, soluble in alcohol

sylvanite $(Au,Ag)Te_2$ Graphic tellurium A native telluride of gold and silver

sylvanium Tellurium

sylvate A salt of abietic acid, $C_{19}H_{24}COOM$

sylvic acid Abietic acid

sylviculture The study of forestry

sylvine An isomorphous native mixture of Na and K chlorides, richer than carnallite

sylvinite A sylvite, with rocksalt containing about 16 % K_2O, used as a fertilizer

sylvite KCl A native potassium chloride, from Stassfurt, used as a fertilizer

Sylvius, François 1614–1672 (Dubois de la Boe) A German-born, Dutch physician who considered combustion and respiration and similar physiological functions, both normal and pathological, as based on chemical reactions

sym- Abbreviation for symmetrical

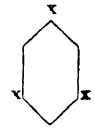
symbiosis A partnership of two different living organisms, either vegetable or animal, which is of mutual benefit to both species **antagonistic-** An association of two living organisms of different species in which one derives more benefit than the other **conjunctive-** The living together of two vegetable or animal organisms with bodily union between them, as, lichens, which consist of algae and fungi **disjunctive-** An association of two living organisms that are not actually united

symbiotic fixation The conversion of atmospheric nitrogen to nitrates or nitrites by soil bacteria and leguminous plants Cf *nitrogen fixation*

symbol Any mark which represents some substance, quality or relation **chemical-** A letter or a combination of letters that represents an atom of an element and its relative mass A chemical symbol is used in several distinct ways (1) to indicate an atom, as, H, Na, S, or Fe (2) To indicate an ion, as, H^+, Na^+, S^{--}, or Fe^{++} (3) To indicate a molecule, as, H_2, Na_x, S_8, or Fe_x (4) To indicate a gram-atom or gram-molecule, thus, H = 1 gm hydrogen, H_2 = 2 grams of hydrogen, $2H_2$ = 4 grams of hydrogen (See *mol*) (5) To indicate an excited atom, by an asterisk, as, H^* (6) To indicate an isotope by its isotopic weight or small letter showing its abundance, as, Cl^{35}, Cl^{37} or Cl^a, Cl^b (7) To indicate an atomic nucleus by prefixing its charge (atomic number) as subscript, and suffixing its mass (isotopic weight) as superscript, thus, $_2He^4$ and $_7N^{14}$ See *Report of a Joint Committee of the Chemical, Faraday and Physical Societies on Symbols*, 1937 *British Standards Institution*, Standard Nos 423, 1938 (electrical), 560, 1934 (engineering), 813, 1938 (chemical) 974, 1941 (chemical plant) Cf *notation, formula, alchemistic symbols* **mathematical-** A letter that indicates quantity, or a mark that indicates or forms part of an algebraic operation **structure-** A graph that indicates the arrangement of atoms in an organic compound (see *structure symbols*)

symmetric, symmetrical Having constituent parts arranged in a definite pattern, repeated over and over again in a definite direction of space, as atoms in a crystal (2) Describing a s compound **axial-** See *stereoisomerism* **plane-** See *stereoisomerism*

s carbon atom See *asymmetric carbon, optical activity, stereoisomerism* **s compound** A benzene derivative in which substitution of the 1,3, and 5-hydrogen atoms has taken place, as,



symmetry Being symmetrical The s of a crystal is determined by regularities in the positions of the similar faces or edges etc , and is defined by the number of elements of symmetry, q v (See *crystal systems*) **axis of-** An imaginary axis through a symmetrical body If such a body is rotated round this axis, the body occupies the same position in space more than once in a complete turn **center of-** A central point of a symmetrical body, around which like faces are arranged in opposite pairs **elements of-** The number of planes, axes and centers of s of a symmetrical body A cube has the largest possible number (23), made up of 9 planes, 13 axes, and one center **external-** The s of the outside crystal form as distinct from the internal s of the arrangement of the atoms **geometrical-** The external shape of a crystal, which resembles that of a geometrical figure **internal-** The s of the arrangement of the atoms inside a crystal, as distinct from its external s **plane of-** An imaginary plane through a symmetrical body, that divides it into halves which are mirror images Cf projection *nucleus*

s groups The grouping of crystals into systems according to the number and nature of their elements of symmetry Thirty-two types exist, of which eleven cover most common substances See *crystal systems*

sympathetic Pertaining to or related to a mutual relationship **s ink** A secret or invisible ink

which is visible only if heated (as cobaltous chloride solution) or when treated with a specific reagent, as, writing with tannic acid solution and developing with ferrous sulfate **s reaction** Induced *reaction*

sympathin A hormone produced in smooth muscle under sympathetic impulse, causing augmentation of blood pressure, heart rate and salivary secretion It resembles epinephrine Cf *sympathol*(2)

sympathol (1) $C_9H_{13}O_2N$ HCl = 203 6 Methyl-δ-hydroxy-β-p-hydroxy-phenylethylamine hydrochloride Colorless crystals, m 184, similar to adrenalin in pharmacological action (2) $C_9H_{13}NO_2$ = 167 1 *p*-Hydroxy-α-(methylamino methyl)-benzyl alcohol HO C_6H_4 CMeOH · NHMe Probably identical with sympathin

sympathomimetic action The stimulation of the sympathetic nervous system by drugs

symphorol Any of the salts of caffeine sulfonic acid, used medicinally as diuretics, as,
symphorol L—Lithium-caffeine sulfonate
symphorol N—Sodium-caffeine sulfonate or nasrol
symphorol S—Strontium-caffeine sulfonate

symplocarpus Skunk cabbage

symphytum Bruisewort, comfrey, blackwort The dried root of *Symphytum officinale*, a Boraginaceae of Europe and Asia, used medicinally as a demulcent

syn- (1) A prefix derived from the Greek "with" or ' together," which signifies union, association **or** "building up " (2) The syn-position

syn-position *σ* The position occupied by two radicals in that type of stereo-isomerism in which they are closer together than in the corresponding anti-position (See *stereo-isomerism*) The radicals are related in that they are similar or may tend to react, *e g*, H and OH may split out and form water

synaldoxime See *aldoxime*

synanthrose $C_6H_{10}O_5$ = 162 1 Levulin A carbohydrate isomeric with inulin, from the rhizomes of *Helianthus tuberosus*, a compositaceous plant

synaptase Emulsin

syncaine Procaine

synchronal Occurring at the same time

synchronism The occurrence of two or more phenomena at the same time

synchronizing To control two or more phenomena so that they occur at the same time, as, a speed-controller for a number of current generators

syncyanin A blue pigment produced by the bacteria, *B syncyanus*, and *B cyanogenus*

syndiazotate See *diazotate*

synephrin $C_9H_{14}NO_2$ = 168 1 A white crystalline powder, used as vasoconstrictor

syneresis The contraction of a clot or gel, as of blood or milk

syngenite $CaSO_4$ K_2SO_4 H_2O A native potassium-calcium sulfate

synonym One of the different names given to the same substance, as, wood alcohol, methyl alcohol or wood-spirit are synonyms for methanol

syntan (1) A sulfurized phenol (2) An artificial tanning material made by the sulfonation of hydrocarbons, *e g*, naphtha

synthalin The synthetic HCl-salt of decamethylene bisguanidine, NH_2 C NH NH$(CH_2)_{12}$NH · C NH NH_2 Used as an insulin substitute, and given by mouth (1 insulin unit = 1 mg synthalin) Now known to be ineffective **s B** Dodecamethylene bisguanidine hydrochloride

synthesis The processes and operations necessary to build up a compound In general, a reaction, or series of reactions, in which a complex compound is obtained from elements or simple compounds Cf *analysis* **electro-** q v **organic-** The production of dye-stuffs and medicinals, or the artificial production of a naturally-occurring substance, *e g*, indigo, camphor, rubber or quinine **photo-** q v

synthesize To produce a complex compound from simpler compounds

synthetic (1) Produced synthetically (2) Produced by artificial means **s drying oil** See *oil* **s resins** The plastics, q v, produced by (a) polymerization (olefines, polyolefines), or (b) condensation (phenolaldehyde, ketone-aldehyde or hydrocarbon aldehyde) Also in a wider sense the polymers of organic compounds, such as, (a) association polymers (viscose silk), (b) hemicolloidal polymers (warm styrene), or (c) eucolloidal polymers (cold styrene)

synthetic An artificially-produced organic compound used in medicine

synthol A synthetic motor fuel obtained from carbon monoxide and hydrogen, in the form of water-gas, when subjected to a pressure of 75 to 150 atmospheres at 400–435°C with a catalyst (iron and sodium carbonate) It is a mixture of higher alcohols, aldehydes, ketones and higher fatty acids with aliphatic hydrocarbons, heating value, 8200 calories per kg

syntonin Muscle fibrin, parapeptone, acid albumin An acid albumin obtained from albumose by the action of dilute hydrochloric acid A yellowish powder, insoluble in water, soluble in acids It is produced in the body as an intermediate product of the gastric digestion of proteins, which eventually become peptones

syphon See *siphon*

syr An abbreviation for syrup

syringa The dried leaves and fruits of *Syringa vulgaris*, the lilac bush, an Oleaceae of America and Europe It contains several glucosides, and is used as bitter tonic

syringe A tube, usually of glass, with a jet at one end and a small piston-pump or bladder at the other, for injections

syringenin $C_{11}H_{14}O_4$ = 210 1 Oxymethyl coniferin A light, rose-red, amorphous mass from syringa, insoluble in water or alcohol, soluble in ether It is formed by hydrolysis of syringin

syringetin $C_{17}H_{14}O_8$ = 314 11 3 4′ 5 7-tetrahydroxy-3′ 5′-dimethoxy flavone A flavone (q v) from lilac

syringic acid $C_9H_{10}O_5$ = 198 1 4-Hydroxy-3 5-dimethoxybenzoic acid An acid obtained by hydrolysis of syringin

syringin $C_{17}H_{24}O_9$ H_2O = 390 3 Lilacin, ligustrin A glucoside from *Syringa vulgaris* (lilac), an Oleaceae, *Ligustrum vulgare* (privet), *Robinia pseud-acacia*, or other plants Long white needles, m 212, slightly soluble in water or alcohol, insoluble in ether Used medicinally as an antipyretic and antiperiodic Cf *syringenin*

syrup Sirup A concentrated aqueous solution of a carbohydrate (as, cane sugar), with or without drugs **simple-** Syrupus simplex An

aqueous solution of cane sugar (83 %), a viscous liquid, d 1 313

s acacia A 10 % solution of acacia in sucrose syrup

system (1) A combination of matter containing one or more phases (2) An organized and related group of facts, phenomena or ideas **binary-** A s involving two components (elements or compounds) **condensed-** A s which contains no gaseous phase **divariant-** A s with two degrees of freedom (cf *phase rule*) which can be represented by an area on a diagram, q v **geological-** See *epochs, strata* **heterogeneous-** A s containing two or more phases or distinct regions, separated from one another by definite boundaries **homogeneous-** A s containing no definite boundaries, one whose properties are the same at all parts, or vary gradually from point to point **mobile-** A s which responds readily to external conditions as pressure and temperature **monovariant-** A s with one degree of freedom (cf *phase rule*), Its conditions are given by the *line* of a diagram q v **nonvariant-** A s with no degree of freedom (cf *phase rule*) It is represented by a point on a diagram, (q v), thus for ice-water-steam, a P of 4 6 mm and T of 0 007°C **periodic-** See *periodic system* **quarternary-** A s involving four components **ring-** See *ring system* **stable-** A s which does not respond readily to a changing environment **tertiary-** A s involving three components **thermodynamic-** A system which may consist of matter, energy, or both, and is limited by a physical or imaginary boundary **unstable-** See *mobile* s

s of compounds See *notation, organic compounds, chemicals* **s of elements** See *periodic system* **s of stars** See *spectral classification*

szomolnokite $FeSO_4 H O$ A native ferrous sulfate

T

T An abbreviation for (1) time, (2) absolute temperature, (3) triple bond, thus T^3 = a triple bond between the third and fourth carbon atom, cf Δ (*delta*), (4) transport number

t An abbreviation for (1) metric ton, (2) time, (3) temperature (not on absolute scale)

τ The Greek letter "tau" The symbol for quantum number, τ_1 = azimutal, τ_2 = radial

θ The Greek letter "theta" Symbol for thermodynamic temperature

Θ The Greek capital letter "theta" (1) A symbol for the absolute temperature at which C_v is $\frac{3}{2}R$ (2) The absolute temperature of a transition point

Ta The symbol for tantalum, At No 73

tabacin The toxic principle of tobacco A yellow, waxy, hygroscopic, acid glucoside containing nitrogen, decomp 110

tabacum Tobacco

tabashir Tabashis

tabashis A secretion of bamboo containing lime and silica, used by Hindus as a cure for tuberculosis

table (1) A lamella, or flat, scale-like crystal (2) The flat surface of a precious stone **t salt** Sodium chloride *iodized-* Sodium chloride with 0 1 % of potassium or sodium iodide **t spoon** An empirical measure, equivalent to about 15 cc or ½ fluidounce **t top impregnation** An acid-proof, waterproof impregnation for laboratory tables It consists of two alternate coatings each of solutions A and B, the scraping off of surplus precipitates, and the final treatment and polishing with linseed oil

A	Copper sulfate	100 gm
	Potassium chlorate	100 gm
	Water	800 cc
	Boil and apply hot	
B	Aniline	120 cc
	Hydrochloric acid	180 cc
	Water	1000 cc

Apply in the order A, B, A, B, let dry for one day, then sand-paper and rub in linseed oil Caution the scraped-off surplus is liable to self-combustion

tablet Tabloid Any medicated disk made by incorporating a drug into a mixture of absorbents or adhesives, and passing the slightly-moistened mixture through a tablet machine The substances, other than drugs or coloring materials, that enter into the composition of a tablet are (1) A moistening agent—water or alcohol (2) Absorbents—starch, milk-sugar, magnesium carbonate, magnesium oxide or licorice root (3) Adhesives—cane sugar, tragacanth, acacia, glucose, gelatin, dextrin, flour boric acid **effervescent-** A tablet in which an effervescent mixture is incorporated, thus causing rapid solution in water Cf *pill*

tabloid A small tablet

tabular crystal A table-shaped or flattened crystal **t spar** Wollastonite

tacamahac (1) A resin from *Calophyllum tacamahaca*, a Guttiferae (2) A resin from *Populus balsamifera*, balsam poplar, a Salicaceae

Tachenius, Otto 17th century A German physician and chemist, the first to use distilled water and to suspect a hidden acid in oils and fats, author of *Epistola de famoso liquore alcahest* (1655) and *Hippocrates chymicus* (1674)

tachhydrite $CaCl_2\,2MgCl_2\,12H_2O$ A white or yellow, very hygroscopic, native calcium magnesium chloride, d 1 671, very soluble in water

tachia Caferana The dried root of *Tachia guianensis*, a Gentianaceae of South Africa and South America, it contains glucosides Used medicinally for malaria, and as a tonic Cf *caferanine, tachinin*

tachinin A glucoside from tachia

tachiol Silver fluoride **iso-** Silver silicofluoride

tachogram A curve that indicates the speed of the blood current

tachometer (1) A device for recording the speed of the blood current (2) An instrument for recording the angular speed of a revolving shaft in revolutions per minute

tachylite A dark, basic, volcanic glass

tachymeter A speed-recorder or speedometer

tachyol Tachiol

tachysterol An isomer of ergosterol which yields vitamin D, (q v) on irradiation Cf *cholane derivatives*

tackiness The property of being sticky, sa, of resins

tactile Pertaining to touch

tæ- *tae-, te-*

tael A Chinese bullion weight unit, 1⅓ oz av

taeniacide Teniacide

taeniafuge Teniafuge

taenite A constituent of iron-nickel meteoric alloys, containing 35–48 % Ni

tagatone $C_{10}H_{18}O$ = 154 14 A ketone, related to myrcene, found in the volatile oil of *Tagates glandulifera*, a Compositae

tagatose $C_6H_{12}O_6$ = 180 09 A hexose, its *d*-form, m 124, is an unfermentable ketohexose

tagud nut The dried fruit of the negrito palm, *Phytelephas macrocarpa*, the source of vegetable ivory

tagulaway Cebur The dried bark of *Parameria vulneraria*, an Apocynaceae of the Philippine Islands It contains a resin and caoutchouc

taka amylase (from Japanese, "taka"-strong) An amylolytic enzyme found with taka diastase **t diastase** An enzyme from a fungus growing on bran, similar in action to diastase **t maltase** An enzyme analogous to maltase and found with taka-diastase

Talbot, William Henry Fox 1799–1877 An English archaeologist and inventor of photographic paper (1840) and plates **T 's law** If any part of the eye retina is excited with intermittent light recurring periodically and regularly and, if the period is sufficiently short, a continuous impression will result, as, in moving pictures

talc (1) $3MgO\ 4SiO_2\ H_2O$ Talcum, soapstone, rensselaerite A hydrous magnesium silicate, having a soft, greasy touch, and found in various grades, as, potstone, steatite, French chalk Purified talcum is used as a dusting powder, as a filtering material and in making crayons (2) In England, mica used for glazing

talcum Talc (1)

talisai oil An oil from the seeds of *Terminalia catappa*, country almond, a Combretaceae

talite Talitol

talitol $C_6H_{14}O_6$ = 182 1 Talite A hexatomic alcohol, $CH_2OH(CHOH)_4CH_2OH$, obtained by reduction of talose, m 86

tallöil A by-product from sulfate woodpulp digestion, consisting mainly of resin acids and fatty acids Used for the manufacture of soap, varnishes and fruit sprays

tallol Floating soap An emulsifying agent obtained from black liquors produced in the manufacture of sulfate and soda pulps Cf *talloil*

talloıs-desmi Talmi

tallow A solid fat, as suet, q v **bone-** See *bone* **Borneo-** Illipé butter (misnomer) A fat used in the chocolate industry, from shared fats **Japan-** See *Japan wax* **mineral-** Hatchettinine

Tallquist scale A thin brochure of perforated sections of blotting paper and ten printed shades of hemoglobin (10 % to 100 %) Diagnosis is made by matching a blot of blood with the color scale

talmi Talmi-gold, talloıs-desmi A gold-plated brass used in jewelry

talomucic acid $C_6H_{10}O_8$ = 210 07 The dibasic acid, $COOH(CHOH)_4COOH$ derived from talose and altrose White crystals, m 158, soluble in water, occurring *d-* and *l*-forms Cf *mucic acid*

talonic acid $C_6H_{12}O_7$ = 196 1 The monobasic acid, $CH_2OH(CHOH)_4COOH$, derived from talose

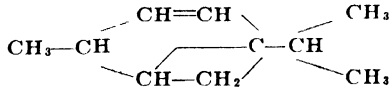
talose $C_6H_{12}O_6$ = 180 1 An aldose or hexose, $CH_2OH(CHOH)_4CHO$, which occurs in two isomeric forms, d- and l-

tamarac The dried bark of the hackmetack, *Larix laricina* or *L americana*, a larch tree of North America Used medicinally, as the fluid extract, as an astringent and stimulant

tamarind The preserved pulp of the fruit of *Tamarindus indica*, a leguminous tree of India, used as a mild laxative

tampicin $C_{34}H_{54}O_{14}$ = 686 4 An amorphous resin obtained from tampico jalap, *Ipomoea simulans*, a Convolvulaceae

tanacetene $C_{10}H_{16}$ = 136 13 A terpene, b-thujene, from thuja oil,



tanacetin $C_{11}H_{16}O_4$ = 212 1 A bitter principle from tanacetum A brown, amorphous, hygroscopic mass, soluble in water or alcohol, insoluble in ether

tanacetone $C_{10}H_{16}O$ = 152 13 A ketone obtained from tansy oil, and apparently identical with thujone A colorless liquid, b 195

tanacetum Tansy The dried leaves and tops of *Tanacetum vulgare*, a Compositae of Asia, Europe and North America **t balsamita** Costmary The dried leaves and tops of *Tanacetum balsamita*, used as a vermifuge **t oil** An essential oil distilled from tanacetum It contains a terpene (tanacetene), a ketone (tanacetone), and alcohol (borneol), used medicinally as an anthelmintic Cf *silverweed*

tanekaha The bark of *Phyllocladus trichomanoides*, a Coniferae or pine tree of New Zealand, used in tanning and dyeing leather

tané-koji A grayish-brown powder from *Aspergillus oryzae*, a mold, used in the manufacture of saké

tangent The ratio of the side opposite the angle concerned to the base of the right-angled triangle in which it occurs

tanghinia The fruit of *Tanghinia venenifera*, an apocynaceous tree of Madagascar Used as an ordeal bean, and contains a cardiac poison, tanghinine

tanghinine $C_{10}H_{16}N$ = 150 1 An alkaloid obtained from tanghinia Colorless lustrous scales, soluble in alcohol, ether or acetic acid, it is a cardiac poison

tang-kui (1) Eumenol (2) Lovage

tangle Laminaria

tank culture Hydroponics

tankage The rendered, dried, ground by-products from the slaughter of animals or from carcasses of animals Used as fertilizer and feeding stuff N, 5–10 %, $Ca_3(PO_4)_2$, 8–30 % **fish-** q v , **garbage-** The rendered, dried, ground product of waste household food materials N, 2 5 3 5 %, P_2O_5, 2–5 %, K_2O, 0 5–1 0 % **gashouse-** A misnomer for "spent oxide," consisting of iron oxide and the materials it has taken up in the purification of illuminating gas It is often rich in nitrogen (5–10 %), but is poisonous to plants **hynite-** A tankage with a high content of nitrogen **process-** Hynite t

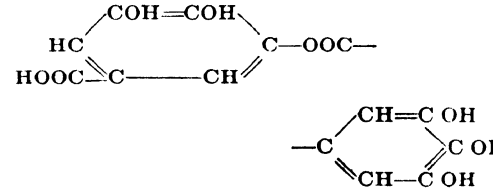
tannal Aluminum tannate

tannalbin Tannin albumate A light brown, odorless and tasteless powder, insoluble in water, alcohol or ether, used as an intestinal astringent

tannase An enzyme in various tannin-bearing plants, it hydrolyzes tannins to gallic acid

tannate A salt of tannic acid

tannic acid (1) $C_{14}H_{10}O_9$ = 322 2 Tannin Gallotannic acid, digallic acid A yellow amorphous powder or lustrous crystalline scales,

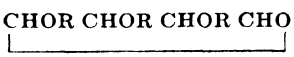


m 200 (decomp), soluble in water, alcohol or glycerol, slightly soluble in ether Used as a reagent and in the treatment of burns (2) $C_{76}H_{52}O_{46}$ Gallotannin, Chinese tannin, Turkish tannin A light yellow-brown powder from galls of oak, sumac, etc , soluble in water or alcohol It is probably pentadigalloylglucose or a glucoside of polydigalloylgallic acids **iodo-** See *iodotannic acid*

tannigen $C_{18}H_{14}O_{11}$ = 406 11 Acetannin, diacetyltannin, tannogen, tannin-diacetanilate, the acetic ester of tannic acid, $C_{14}H_8(COMe)_2O_9$ A light gray powder, insoluble in water, soluble

in alcohol, used medicinally as an intestinal astringent

tannin (1) Tannic acid (2) The glucoside, pentadigalloylglucose, from nutgalls



in which R represents tannic acid less the —OH of the carboxyl group (3) See *tannins*

acetyl-, diacetyl- Tannigen

iodo- See *iodotannin*

t albumate Tannalbin

tanning The process of converting skins or hides into leather

t materials A group of native vegetable preparations that contain tannic acid

TANNING MATERIALS

		*
Anacardiaceae		
Pistacio, *Pistacia* species	g	30–40
Sumac, *Rhus copallina*	l	17–38
White sumac, *Rhus glabra*	l	15–25
Chinese galls, *Rhus semialata*	g	70
Tizra sumac, *Rhus pentaphylla*	r	29–31
Quebracho, *Schinopsis* species	e	35–65
Apocynaceae		
White quebracho, *Aspidiosperma* sp	l	27–30
Betulaceae		
Birch, *Betula alba*	b	3–18
Alder, *Alnus glutinosa*	b	16–20
Minibari, *Alnus firma*	f	25–28
Combretaceae		
Dhaura, *Anogeissus latifolia*	l	10–20
Myrobalan, *Terminalia chebula*	n	30–40
Kumbuk, *Terminalia glabra*	b	27–32
Thann, *Terminalia oliveri*	b	30–35
Coniferae		
Australian fir, *Callitris* sp	b	17–31
Celery pine, *Phyllocladus* sp	b	28–30
Larch, *Larix europoea*	b	9–10
Western larch, *L occidentalis*	b	10–12
Hemlock, *Tsuga canadensis*	b	7–16
Dipterocarpaceae		
Ironwood, *Hopea* sp	b	17–22
Pentacme suavis	l	12–24,
	b	7–13
White dammar *Vateria indica*	f	25
Euphorbiaceae		
Clerstanthus collinus	b	32–34
Amla, *Phyllanthus emblica*	f	26–35,
	l	23–28,
	b	15–24
Fagaceae		
Chestnut, *Castanea* sp	b	6–8,
	w	7–11
Live oak, *Quercus agrifolia*	b	19
Valonia, *Quercus aegilops*	c	30–65,
	a	17–40
Turkey oak, *Quercus cerris*	g	35
Aleppo oak, *Qu infectoria*	g	24–60
Common oak, *Qu robur*	b	9–12,
	w	2–4
Red oak, *Qu rubra*	g	35,
	b	4–6
Quercitron bark, *Q tinctoria*	b	25–30
Leguminosae		
Angica, *Acacia angica*	b	20–25
Babul, *A arabica*	b	12–20,
	p	20–42
Black wattle, *A binervata*	b	30
Cutch, *A catechu*	e	60
Wattle, *A decurrens*	b	20–51
Green wattle, *A microbotrya*	b	12–47
Hickory, *A penninervis*	b	14–38
Golden wattle, *A pycnantha*	b	40–50
Bengal kino, *Butea frondosa*	e	30–40
Algarobilla, *Caesalpinia brevofolia*	p	43–67
Cascalote, *C cacolaco*	p	40–55
Divi-divi, *C coriaria*	p	30–50
Tari, *C digyna*	p	40–50
Guyacan, *C melanocarpa*	p	15–24
Tarwar, *Cassia auriculata*	b	16–22
Elephant roots, *Elephantorrhiza*	r	6–22
Timbo, *Enterolobium timbouva*	b	22
Paypay, *Inga feuillei*	p	15–20
Ingagwazu, *I affinis*	b	26
Mimosa, *Mimosa pudica*	r	10
Yhvihta, *Peltaphorum dubium*	b	31
Kurupaih-ra, *Piptadenia rigida*	b	28
Camanchile, *Pithecolobium dulce*	b	15–25
Kino, *Pterocarpus* species	e	45–60
Meliaceae		
Piagao, *Xylocarpus granatum*	b	21–48
Tabique, *X obovatus*	b	22–28
Kaatigua, *Trichilia* sp	b	21–25
Myrtaceae		
Mountain gum, *Eucalyptus alba*	b	30
Ribbon gum, *E amygdalina*	s	58–65
Bloodwood, *E corymbosa*	s	28,
	l	18
White mallet, *E erythronema*	b	30
Eucalyptus, *E globulus*	s	28
Spotted gum, *E maculata*	s	45
Black mallet, *E occidentalis*	b	40–50,
	l	20–30
Mallet, *E occidentalis*	b	30–50
Messmate, *E piperita*	s	33–62
Moort, *E platypus*	b	25
Red ironbark, *E siderophloia*	s	35–73
Yhva, *Eugenia* species	b	44,
	l	15
Oak gum, *Spermolepsis* species	s	43–80
Malpighiaceae		
Tamwood, *Byrsonima* species	b	22–40
Mangrutta, *Malpighia* species	b	20–30
Palmae		
Saw palmetto, *Sabal cerrulata*	l	13
Polygonaceae		
Canaigre, *Rumex* species	r	25–30
Protaceae		
Heath honeysuckle, *Banksia* species	b	12–25
Sugarbush, *Protea* species	b	15–25
Rhizophoraceae		
Mangrove, *Braguiera* species	b	22–52
Bahau, *Ceriops candolleana*	b	25–43
Tangal, *C tagal*	b	24–37
Mangrove, *Rhizophora* species	b	21–58,
	l	22
Rosaceae		
Tormentilla erecta	r	20–46
Sapindaceae		
Guara, *Paullinia sorbilis*	f	43–55
Tamaricaceae		
Tamarisk, *Tamarix species*	g	26–58,
	l	10
Punicaceae		
Pomegranate, *Punica granatum*	f	27–32,
	b	20

* Approximate percentage of tannins in a—acorns, b—bark, e—extract f—fruit, g—galls, l—leaves, n—nuts, p—pods, r—root, s—secretions or sap, w—wood

tannins A group of astringent, aromatic, acidic compounds found in various plants and trees They precipitate alkaloids, mercuric chloride, and heavy metals, form deep blue or black solutions (ink) with ferric solutions, and their strongly alkaline solutions absorb oxygen rapidly

The term should be restricted to the glucosides The most common tannin is tannic acid (See table of *tanning materials*)

Types of tannins

1 Hydrolyzable tannins, Ester-type RCOOR

a Depsides or gallotannins,

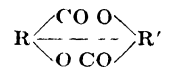
di-β-resorcylic acid	$C_{14}H_{10}O_7$
diprotocatechuic acid	$C_{14}H_{10}O_7$
digentisic acid	$C_{14}H_{10}O_7$
m-digallic acid	$C_{14}H_{10}O_9$
hamamelitannin	$C_{20}H_{20}O_{14}$
chebulinic acid	$C_{34}H_{30}O_{27}$
gallotannic acid	$C_{76}H_{52}O_{46}$

b Glusides or galloylsugars,

$$(HO)_xRCOOR'(OH)_y$$

digalloyl-l-glucosan	$C_{20}H_{18}O_{13}$
trigalloyl glycerol	$C_{24}H_{20}O_{15}$
α-trigalloyl-l glucosan	$C_{27}H_{22}O_{17}$
trigalloyl glucose	$C_{27}H_{24}O_{18}$
trigalloyl acetoneglucose	$C_{30}H_{28}O_{18}$
tetragalloyl erythrite	$C_{30}H_{26}O_{20}$
tetragalloyl methylglucoside	$C_{35}H_{30}O_{22}$
pentapyrogallol carbonyl glucose	$C_{41}H_{32}O_{26}$
pentagalloyl glucose	$C_{41}H_{32}O_{26}$
hexagalloyl mannite	$C_{48}H_{38}O_{30}$
penta-digalloyl-glucose	$C_{76}H_{52}O_{46}$

c Ellagitannins or diphenylmethylolids,



ellagic acid	$C_{14}H_6O_8$
cyanomaclurin	$C_{15}H_{12}O_6$
ellagitannin	$C_{20}H_{16}O_{13}$

2 Condensed tannins, Keto-type, R CO R

d ketones, HOR CO R′

hydroxybenzophenone	$C_{13}H_{10}O_2$

Catecholtannins or phlobatannins,

maclurin	$C_{13}H_{10}O_6$
pinitannic acid	$C_{14}H_{16}O_8$
quinotannic acid	$C_{14}H_{16}O_9$
galitannic acid	$C_{14}H_{16}O_{10}$
ipecacuanhic acid	$C_{14}H_{18}O_7$
rubitannic acid	$C_{14}H_{22}O_{12}$
quercin	$C_{15}H_{12}O_9\ 2H_2O$
l-catechol	$C_{15}H_{14}O_6\ 3H_2O$
d-catechol	$C_{15}H_{14}O_6\ 4H_2O$
epicatechol	$C_{15}H_{14}O_6$
catechol carboxylic acid	$C_{16}H_{14}O_8$
pimicortannic acid	$C_{16}H_{18}O_{11}$
cola tannin	$C_{16}H_{20}O_8$
cocatannic acid	$C_{17}H_{22}O_{10}$
maletto tannin	$C_{19}H_{20}O_9$
hemlock tannin	$C_{20}H_{18}O_{10}$
quercitannic acid	$C_{20}H_{20}O_4$
sequoia tannin	$C_{21}H_{20}O_{10}$
tormentilla tannin	$C_{26}H_{22}O_{11}$
horse chestnut tannin	$C_{26}H_{24}O_{12}$
rheotannic acid	$C_{26}H_{26}O_{14}$
fraxitannic acid	$C_{26}H_{32}O_{14}$
cortepinitannic acid	$C_{32}H_{34}O_{17}$
paullinio tannin	$C_{38}H_{36}O_{20}$

tannoform $C_{29}H_{20}O_{18}$ = 656 2 Methylene-ditannin, $(C_{14}H_9O_9)_2CH_2$ A condensation-product of formaldehyde and tannic acid A pink powder, insoluble in water, soluble in alcohol or ether

tannogen Tannigen

tannon Tannopin

tannopin $C_{48}H_{42}O_{27}N_4$ = 1106 3 Hexamethylenetetraminetannin, tannon, urotropine-tannin, $(CH_2)_6N_4(C_{14}H_{10}O_9)_3$ A light-brown powder, insoluble in water or alcohol, used medicinally as an intestinal antiseptic and disinfectant

tannyl The monovalent radical, $—C_{14}H_9O_9$, derived from tannic acid **t acetate** Tannigen

tansy Tanacetum **wild-** Silverweed **t oil** Tanacetum oil

tantalate A salt of tantalic acid of the type, $MTaO_3$ **hexa-** A salt of the type $M_8Ta_6O_{19}$ **peroxy-** A salt of the type M_3TaO_8

tantalic acid $HTaO_3$ = 230 5 Colorless crystals, insoluble in water, soluble in hydrofluoric acid It forms complex salts, as, $Na_8Ta_6O_{19}$

tantalite $(FeMn)O\ Ta_2O_4$ A native iron tantalate, black crystals, often found with niobium

tantalites A group of minerals of the type, $M(TaO_3)_2$, where M is divalent iron or manganese They are usually mixed with the corresponding columbites, $M(CbO_3)_2$

tantalous A compound of trivalent tantalum **t bromide** See *tantalum bromide* (1) **t chloride** See *tantalum chloride* (1)

tantalum Ta = 180 88 A rare metal of the vanadium family, and element, atomic number 73 It is a gray platinum-like metal, d 16 6, m 2850, insoluble in alkalis or acids, (except hydrofluoric acid) It occurs in tantalite and columbite and was discovered in 1802 by Ekeberg The principal valency of Ta is five, but it also forms compounds containing trivalent tantalum It is resistant to corrosion and is used as a substitute for platinum, for filaments in incandescent electric light bulbs, and as an electrode in current rectifiers for radio instruments, for surgical instruments, as it may be sterilized in the flame without losing hardness, and for rayon spinnerets, jewelry and laboratory ware **t bromides** (1) $TaBr_3$ = 421 5 Tantalous bromide, t tribromide Yellow crystals, m 240, b 320, decomp by water or alcohol (2) $TaBr_5$ = 581 1 Tantalic bromide A colorless powder, decomp by water **t carbide** TaC = 192 9 A hard, high melting-point solid A mixture of 75 % TaC and 25 % HfC has the highest known melting point (above 4200°C) **t chlorides** (1) $TaCl_3$ = 287 88 Tantalous chloride Yellow prismatic crystals, d 3 68, decomp by water, soluble in sulfuric acid (2) $TaCl_5$ = 359 0 Tantalic chloride Light-yellow, crystalline needles, m 211, b 242, decomp in moist air or water to tantalic acid, soluble in potassium hydroxide or absolute alcohol **t fluorides** A group of double salts of the type, $(MF)_2TaF_5$, or, M_2TaF_7, M is a monovalent metal **t minerals** Tantalum occurs in nature associated with columbium Its principal ore is tantalite, $FeTa_2O_6$ **t nitride** TaN = 195 5 A colorless powder insoluble in water or acids, soluble in a mixture of HF and HNO_3 **t oxide** Ta_2O_5 = 443 0 Tantalic acid anhydride, t pentoxide, tantalic oxide A white, rhombic, crystalline powder, d 7 53, insoluble in water or alcohol, soluble in fused potassium bisulfate **t pentabromide**

See *t bromide* (2) **t pentachloride** See *t chloride* (2) **t pentoxide** See *t oxide* **t potassium fluoride** K_2TaF_7 = 392 7 White silky needles, slightly soluble in water **t tribromide** See *t bromide* (1) **t trichloride** See *t chloride* (1)

tantcopper A copper alloy, analogous to tantiron

tantiron An acid-resistant alloy of iron containing silica, used for chemical equipment

tantnickel A nickel alloy analogous to tantiron

tapioca Cassava, manioca starch, Bahia arrowroot, Rio arrowroot, mandioc The starch granules of the root of cassava, *Jatropha manihot*, an Euphorbiaceae of Brazil and the West Indies, used as food

tar A thick brown to black liquid with a distinctive odor, obtained by the distillation of wood, peat, coal, shale or other vegetable or mineral materials It is a mixture of hydrocarbons and their derivatives **coal-** A thick, black liquid obtained by the destructive distillation of bituminous coal or crude petroleum It contains many aromatic hydrocarbons and phenols, including naphthalene, toluene, quinoline, aniline, cresols Cf *coal* **oil of-** T oil **pine-** Wood tar **rock-** Crude petroleum **wood-** Pix liquida, pine tar The empyreumatic syrup-like mass obtained by distillation of the wood of *Pinus* species It contains resins, turpentine and oils, used as a disinfectant and antiseptic On fractional distillation it yields an acid liquor (pyroligneous acid), empyreumatic oil (oil of tar) and a black residue (pitch) **t camphor** Naphthalene **t oil** Oleum picis rectificatum The volatile oil from pine t, rectified by steam distillation, d 0 862–0 872

tarapacaite Native potassium chromate

taraxacerin $C_8H_{16}O$ = 128 1 A ketone obtained from taraxacum

taraxacum Dandelion, lion's tooth The dried rhizome and roots of *T officinale*, a Compositae, used as a tonic and mild laxative

taraxanthin $C_{40}H_{56}O_4$ = 600 43 A carotenoid (q v) from dandelion flowers, m 184, an isomer of violaxanthin

tarchonyl alcohol $C_{50}H_{100}O$ = 718 79 An alcohol of the methanol series, m 82, insoluble in water, from the leaves of *Tarchonanthus camphoratus*, a Compositae of Africa

tare (1) The weight of a container in which a substance is to be weighed (2) A counterweight used to balance a container (3) A plant of the vetch family, grown for fodder (4) Any weed that grows among corn (5) Waste cloth wrappings, usually of jute, used for paper manufacture

target. (1) Anticathode (2) A substance exposed to bombardment by particles Cf *rays, radioelements*

targusic acid Lapachol

tariric acid $C_{18}H_{32}O_2$ = 280 3 5-octadecynoic acid*, $Me(CH_2)_{10}C\ C(CH_2)_4COOH$ An unsaturated acid, m 50 5, an isomer of linoleic acid occurring as glyceride in the fruit fats of Guatemalan tariri, seeds, from *Picramia* species

tarnish A surface film of a contrasting color formed on an exposed surface of a metal or mineral, it usually consists of the oxide or sulfide

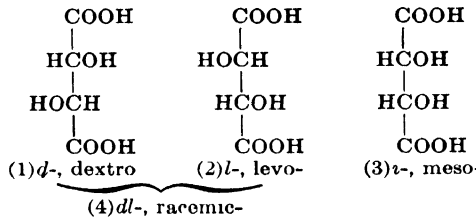
taro The rhizome of *Colocasia esculenta*, an Araceae of the tropics whose poison is destroyed by boiling, used as food (poi).

tarpaulin (1) Canvas rendered waterproof by a coating of tar (2) A waterproof cloth

tarragon The plant *Artemisia tranunguloides*, a Compositae, used as spice **t oil** Estragon oil

tartar (1) Tatar A crude potassium bitartrate which forms as sediment in wine casks (2) Calculus A deposit of saliva proteins and calcium phosphate on teeth, causing mechanical friction on gums which may lead to pyorrhea. **cream of-** Potassium bitartrate **oil of-** A saturated solution of potassium carbonate **salt of-** Potassium carbonate **t emetic** Potassium antimonyl tartrate

tartaric acid $C_4H_6O_6$ = 150 1 Dihydroxysuccinic acid, *2 3*-dihydroxybutanedioic acid* A dibasic, tetratomic acid, 4 isomers



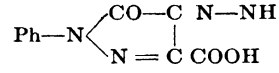
The common acid is *d-* and occurs in many vegetable tissues and fruits **dextro-** or **levo-** Clear, colorless, monoclinic crystals, d 1 76, m 168, soluble in water or alcohol, insoluble in ether Used as a reagent and in pharmaceutical preparations **inactive-** Meso- **levo-** See *dextro-* **meso-** $+1H_2O$ Colorless scales, d 1 666, m 140, slightly soluble in water **racemic-** $+1H_2O$ A mixture of dextro- and levotartaric acids, m 205

tartarlithine Lithium bitartrate

tartarus Potassium bitartrate **t stibiatus** Potassium antimonyl tartrate **t tartarisatus** Potassium tartrate **t vitriolatus** Potassium sulfate

tartrate A salt of tartaric acid of the type, $M_2C_4H_4O_6$ **acid-** or **bi-** A salt of the type, $MC_4H_5O_6$ **bi-** Acid- **normal-** See *tartrate* **pyro-** See *pyrotartrate*

tartrazine A yellow pyrazolone dye of the type,



Often used in foodstuffs

tartronic acid $C_3H_4O_5\ \frac{1}{2}H_2O$ = 129 1 Oxymalonic acid, propanoldiacid, *2*-hydroxypropanedioic acid*, isopropanol diacid, COOH - CHOH COOH Colorless prisms, sublime 110, decomp 186, m 185, soluble in water, alcohol or ether **benzyl-** See *benzyltartronic acid* **methyl-** Isomalic acid

t acid series A group of polyhydroxy acids (q v) formed from carbohydrates, as

tartronic acid	HOOC(CHOH)COOH
tartaric acids	$HOOC(CHOH)_2COOH$
ribosic acids	$HOOC(CHOH)_3COOH$
saccharic acids	$HOOC(CHOH)_4COOH$

tartronyl The bivalent radical, —CO CHOH - CO— **t urea** Dialuric acid

taste The sensation caused by a soluble substance on the nerves of the tongue Classification

acid	*e g* , hydrogen ions
sweet	*e g* , sugars
bitter	*e g* , strychnine
saline	*e g* , sodium chloride
metallic	*e g* , iron or copper salts
astringent	*e g* , alum
alkaline	taste of hydroxyl ions

The threshold values of taste stimulus for the four fundamental tastes are

salty	0 25 gm NaCl per 100 cc H_2O
sweet	0 5 gm sugar per 100 cc H_2O
acid	0 007 gm HCl per 100 cc H_2O
bitter	0 00005 gm quinine per 100 cc

Cf *odor*

tatar Tartar

tau The Greek letter τ (see under T)

taurine $C_2H_7O_3NS$ = 125 14 Aminoethionic acid aminoethylsulfonic acid, $NH_2 CH_2 CH_2 SO_3H$ Large monoclinic prisms, m 240 (decomposes), soluble in water insoluble in alcohol or ether, formed in bile by the hydrolysis of taurocholic acid

taurocarbamic acid $C_3H_8O_4N_2S$ = 168 15 $NH_2 CO NH CH_2 CH_2 SO_3H$ It occurs sometimes in urine

aurocholeic acid $C_{27}H_{47}NO_6S$ = 513 45 A bile acid (q v), which hydrolyses to choleic acid and taurine

aurocholic acid $C_{26}H_{45}O_7NS$ = 515 4 Choleic acid An acid in bile Colorless needles, soluble in water or alcohol, m 180, it hydrolyzes to taurine and cholic acid

auryl The monovalent radical, $NH_2 CH_2 CH_2 SO_2$—

taurylic acid $C_7H_{14}O_2$ = 130 12 An acid occurring sometimes in urine

tauto- A prefix indicating a tautomeric form of the substance it describes, as, tautohypoxanthine

tautocyanate An ester of the type R N CO

tautomeric Existing in a dynamic, isomeric state, describing a substance which can react in manners corresponding with two different structural arrangements of its atoms

tautomerism Dynamic allotropy The property of certain substances of existing in a state of equilibrium between two isomeric forms, and being able to react according to either It differs from the related types of metamerism and desmotropism (q v), because the two latter produce relatively stable compounds which react in accordance with a specified structure The molecules may differ in L (the linkage, bond or connections between the atoms) and P (the position or distribution of these atoms in the molecule) Hence

Tautomerism	L—different, P—different
Metamerism	L—alike, P—different
Desmotropism	L—different, P—alike

hence R CN and R NC, R ONO and R NO_2, R CO NHR and R C NH OR are tautomeric The ketone-enol type of transformation is desmotropic RNH C NR', R'NH C NR are metamers Cf *desmotropes* **electrolytic-** The phenomenon exhibited by an amphoteric substance in solution, which produces hydroxyl ions in presence of acids and hydrogen ions in presence of alkalis

tautourea $NH_2 C NH OH$, as distinct from $NH CO NH_2$ (urea)

tautouric acid A tautomeric form of uric acid, q v

tawing The tanning of hides with mineral substances, *e g* , alum, sodium chloride, chromium or aluminum salts

taxicatin $C_{13}H_{22}O_7 2H_2O$ = 326 2 A crystalline glucoside from the twigs of taxus

taxine $C_{37}H_{51}O_{10}N$ = 669 4 An alkaloid from the seeds and leaves of *Taxus baccata* White scales, m 80, slightly soluble in water

taxis The movement of a cell in response to an external stimulus, as, chemotaxis, electro-taxis, photo-taxis

taxus Yew, chinwood The poisonous dried seeds of *Taxus baccata*, a Taxaceae of Europe and Northern Africa

Taylor, Hugh Stutt 1890– An English-born American chemist, noted for work in photochemistry and thermodynamics

Taylor-White process A method of toughening steel by heating it almost to fusion and cooling it in molten lead, followed by cooling in hot oil, reheating to 400–600°C and cooling in air

tazettine $C_{18}H_{21}NO_5$ = 331 17 An alkaloid from the dried corm of *Narcissus tazetta*, related to sekisanine

TB An abbreviation for tuberculin

Tb The symbol for terbium

Te The symbol for tellurium

tea (1) A decoction or infusion of a medicinal plant (2) The dried leaves of *Thea sinensis* and other species of China, Japan, India and other tropical countries Average composition

water	10 %
extractives	32 7 %
tannin	11 4 %
caffeine	1 9 %
ash	6 23 %
fibers	40–60 %

The following plants are used as tea

(1) For medical use (Cf *species*)

Paronychia species	Algerian t
Melaleuca species	Australian t
Chenopodium anthelminticum	Mexican t
Monarda species	Oswego t
Gaultheria species	Salvador t
Capraria species	West Indian t

(2) As beverages

Thea sinensis	Chinese t (Pekoe, souchong, congou)
Catha edulis	Arabian t (kat)
Stachytarpheta species	Jamaica t
Ledum palustre	Labrador t
Ilex paraguensis	Paraquay t (maté)
Neea theifera	Caparrosa t

Brazil- Maté **James-** See *Labrador t* **Jesuits-** Maté **Paraguay-** Maté

t berries Gaultheria **t cup** About 120 cc or 4 fluid ounces **t root** The root of *Ceanothus Americanus*, a Celastraceae, used as an astringent Cf *ceanothine* **t spoon** About 4 cc or 1 fluid drachm **t tree** Cajeput

teak The extremely hard wood of *Tectona grandis*, (Verbenaceae) a tree of Southern Asia

tear gases A group of volatile lachrymatory compounds used in warfare They are, in general, halogenated ketones of the type RCO - CH_2X, as chloroacetophenone, or halogenated cyanides, as PhCHBrCN, brombenzylcyanide Cf *poison gas*

teas (1) See *tea* (2) See *species*
tebelon Isobutyloleate
technic (1) Technique The details of a method of procedure (2) The mechanical trades **pyro-** The manufacture of fireworks
technical Pertaining to the manufacturing trades **t analysis** The analytical methods employed in industry for the rapid evaluation of materials
technique Technic
technology A branch of science that deals with the methods of manufacturing materials from vegetable, animal or mineral sources
Teclu burner A modified bunsen burner the air and gas streams of which can be finely adjusted
tecomin Lapachol
tecsol A product of wood distillation, used as a denaturant for alcohol
tegit A trade name for molded asbestos and tar products used for electrical insulation
Teichmann's crystals See *hemin*
teilungs koeffizient Distribution coefficient
tekite A variety of meteorite
telautograph An instrument for directly transmitting sketches or writing
tele- A prefix derived from the Greek "far off," indicating distance
telekinesy Action at a distance without contact
telephan [A better term than televox, which is a Greco-Latin hybrid] An instrument in which sound waves of certain frequencies activate electrical relays, and so enables the operation of devices to be controlled by sounds
telephone An electrical instrument for transmitting sound
telephotography The transmission of black and white pictures by telegraphy or wireless (cf *television*)
telescope An optical instrument for observing distant objects, used in the laboratory for reading measuring scales at a distance
television See *telopsis, iconoscope*
televox Telephan
telfairic acid A fatty acid, d 0 9429 m 6, b 225, from East African gourd seeds, *Telfairia pedata*, a Cucurbitaceae, probably identical with linoleic acid
tellerwort Sanguinaria
tellurate A salt of telluric acid of the general type, M_2TeO_4, or M_6TeO_6
tellur bismuth Tetradymite **t nickel** Melonite **t ocher** TeO_2 Tellurium dioxide
telluretted An obsolete term for a compound containing divalent tellurium **t hydrogen** Hydrogen telluride
telluric (1) Of earthly (as opposed to meteoric, or solar) origin (2) Referring to hexa-valent tellurium **t acid** H_2TeO_4 = 193 5 Allotelluric acid A colorless powder, d 3 441, decomp 160, insoluble in water, alcohol or alkalis **soluble-** H_6TeO_6 or, $H_2TeO_4,2H_2O$ = 229 5 A white crystalline substance obtained by oxidation of tellurium dioxide
t bismuth Tetradymite **t lead** Nagyagite **t lines** The lines in the solar spectrum due to absorption of rays by the atmosphere, as, Fraunhofer lines A and B Their intensity varies with the altitude of the sun, and they do not show the Doppler shift **t ocher** Tellurite **t silver** Hessite
telluride (1) A binary compound containing divalent tellurium, of the general type, M_2Te There are various native minerals

hessite	Ag_2Te
altaite	PbTe
tetradymite	Bi_2Te_3

(2) Weissite (3) An organic compound of the type R_2Te **di-** Pertelluride An organic compound of the type $R_2Te\ Te\ R$ **per-** Di-
tellurinic acid* A compound of the type $RTeO_2H$, as, methanetellurinic acid*, CH_3-TeO_2H Cf *telluronic acid, sulfinic acid*
tellurious Tellurous
tellurite (1) Any salt of tellurous acid containing tetravalent tellurium of the general type, M_2TeO_3 (2) TeO_2 Telluric ocher Native tellurium dioxide
tellurium Te = 127 61 Sylvanium A nonmetal and element atomic number 52 Amorphous rhombic crystals d 6 25, m 451, b 1390, insoluble in water, soluble in concentrated sulfuric acid or alkalis Te is a homolog of sulfur and selenium and forms several series of compounds

(inorganic compounds)

valency	−2	4	6
ion	Te^{--}	TeO_3^{--}	TeO_4^{--}
name	tellurides and tellurous	tellurites	tellurates and telluric

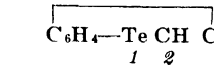
(organic compounds)

R_2Te	R_2TeO
R-tellurides	R-tellurium oxide

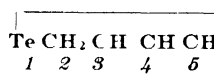
It was discovered by Muller in 1782 and occurs native as hionite in tellurite and tellurides **black-** (Pb,Au) (Te,S) A lead-gold mineral **foliated-** Nagyagite **graphic-** Sylvanite **radio-** Polonium
t bichloride See *t chloride* **t bromides** (1) $TeBr_2$ = 287 3 T dibromide, tellurous bromide Steel-gray needles, m 280, b 339, decomp by water (2) $TeBr_4$ = 447 25 T tetrabromide, telluric bromide A white powder, slightly soluble in water, and hydrolysed by it **t chlorides** (1) $TeCl_2$ = 198 4 Tellurous chloride *t* dichloride Black crystals, d 6 89, m 175, b 324, decomp by water (2) $TeCl_4$ = 269 3 Telluric chloride, t tetrachloride A white crystalline powder m 224 b 380, decomp by water **t dibromide** T bromide (1) **t dichloride** T chloride (1) **t diethyl** $TeEt_2$ = 185 6 A liquid, b 137 **t dimethyl** $TeMe_2$ = 157 6 A liquid, b 182 **t dioxide** See *t oxide* **t disulfide** T sulfide **t glance** Nagyagite **t graphite** $(AgAu)Te_2$ A native gold-silver telluride Cf *sylvanite* **t hydride** Hydrogen telluride **t hydroxides** (1) A group of organic compounds of the type, R_3TeOH (2) The slightly basic tellurous acid, $TeO(OH)_2$ **t iodide** TeI_2 = 381 3 A black crystalline mass, insoluble in water **t lead** An acid-resistant lead containing 0 05 % Te It resists mechanical shock and stress reversal better than pure lead, and may be used with sulfuric acid of strength below 77 % **t monoxide** See *t oxide* **t nitrate** $Te_2O_3(OH)NO_3$, derived from tellurous acid, $TeO(OH)_2$ **t nitrates** A group of organic compounds of the type $R_2Te(NO_3)_2$ **t oxides** (1) TeO = 143 5 T monoxide* a rare compound (2) TeO_2 = 159 5 T dioxide Yellow octahedral crystals, d 5 89, m 700, slightly soluble in water, soluble in alkalis (3) TeO_3 = 175 5 T trioxide An orange colored powder, $d_{15°}$ 5 07, decomp at red-heat, insoluble in water, soluble in alkalis (4) A

group of organic compounds of the type, R_2TeO, as, Me_2TeO, dimethyltellurium oxide **t oxychloride** $TeOCl_2$, derived from tellurous acid **t sulfate** $Te_2O_3SO_4$, derived from tellurous acid, $TeO(OH)_2$ **t sulfide** TeS_2 = 191 6 A black amorphous powder, insoluble in water or acids **t sulfite** $(TeO_2)_2SO_3$, derived from tellurous acid **t sulfoxide** $TeSO_3$ = 207 5 A compound formed by treating tellurium with concentrated sulfuric acid **t trioxide** See *t oxide*

telluro- A prefix indicating the divalent atom, =Te Cf *sulfo-, seleno-* **t naphthene** C_9H_8Te = 229 55



t pyran C_5H_6Te = 193 55



telluronic acid A compound of the type $RTeO_3H$, as, methane telluronic acid*, CH_3TeO_3H Cf *tellurinic acid, sulfonic acid*

telluronium A compound of the type $R\,TeH_3$ Cf *selenonium*

tellurous Tellurious Describing a compound which contains tetravalent tellurium **t acid** H_2TeO_3 = 177 5 Tellurious acid Colorless octahedral amphoteric crystals, d 3 053, decomp 40, slightly soluble in water, alcohol or ether Since $H_2TeO_3 \rightleftharpoons TeO(OH)_2$, it forms a series of salts of the type M_2TeO_3, $M_2Te_2O_5$, $M_2Te_3O_7$ and $M_2Te_4O_9$, as well as a sulfate $TeO\,SO_4$ nitrate, oxychloride, and oxybromide **t bromide** See *tellurium bromide* **t chloride** See *tellurium chloride* (1) **t sulfate** $Te(SO_4)_2$ = 319 64 A crystalline solid

telluryl The divalent radical =TeO, derived from tellurous acid, q v

telopsis [A better term than television, which is a Greco-Latin hybrid] The transmission of far-off events and moving scenes by telegraphy or radio (wireless) Cf *radiovision*

temperature The intensity of heat or the degree of heat of a body, measured by a thermometer (q v) and expressed in °C Cf *quantity of heat, calorie* The extremes of t are

TEMPERATURE MAGNITUDES

Stellar interior	72 000 000°F	40,000 000°C
Stellar surface (B star)	41,000°F	23 000°C
Mercury lamp	25 200°F	14 000°C
Solar surface (G star)	10 800°F	6 000°C
Sun furnace (focus of 19 lenses)	10 000°F	5 500°C
Atomic hydrogen torch	7 600°F	4 200°C
Induction furnace (conductors)	7 200°F	4 000°C
Electric arc in vacuum	5 400°F	3 000°C
Stellar surface (M star)	5,400°F	3 000°C
Tungsten, melting point	5 350°F	2,970°C
Oxy-hydrogen torch	3 600°F	2 000°C
Gas burner	3,090°F	1,700°C
Rubrene melting point	932°F	501°C
Water boiling point	212°F	100°C
Hottest climate (Tripoli)	136 4°F	58°C
(Death Valley)	134 1°F	56 8°C
Man, body temperature	98 6°F	37°C
Ocean water (La Jolla)	78 4°F	25 7°C
Water freezing point	32°F	0°C
Mercury freezing point	−37 8°F	−38 8°C
Coldest climate (Alaska)	−82°F	−63 3°C
(Northern Siberia)	−87°F	−66 1°C
Liquid air	−319°F	−195°C
Interstellar space	−454°F	−270°C
Hydrogen freezes	−458°F	−272 2°C
Lowest experimental temperature	(0 75°A)	−272 38°C
Absolute zero	(0°A)	−273 13°C

(1°F-0 5556°C and 1°C-1 8°F)

absolute- T as measured on, or calculated to the absolute thermometer scale, °A which begins at −273°C **color scale of-** See *color* **critical-** The t above which a gas can not be condensed to a liquid by pressure alone **critical solution-** See *critical* **flame-** See *flame temperature* **maximum-** The t above which life or growth of bacteria ceases **normal-** (1) Room t (2) The t as measured on the hydrogen thermometer (3) Standard- **optimum-** The t most favorable for the action of an enzyme or the growth of an organism **potential of-** Escaping tendency, q v **room-** The average t of about 20°C or 68°F (293°A) In England 15 5°C or 60°F **salt-** The t at which crystals commence to separate when a solution is concentrated by boiling **standard-** A t of 0°C or 273°A

t coefficient A factor that indicates quantitatively the effect of t on a property of matter, as of

electrical conductivity	2 5 % per 1°C
chemical reactivity	2 to 3 5 % per 10°C

t indicator An electrical instrument consisting of a dial and galvanometer, which accurately measures the temperature **t reaction** See *Vaumené number* **t regulator** Thermo-regulator **t recorder** An electrical device for permanently recording the temperature at one or more locations **t scale** See *thermometer scale*

tempered Subjected to repeated heatings each of less intensity than the one before it **t steel** A steel that has been hardened and subsequently heated again at a lower temperature

tempering (1) The reheating and cooling of metal, especially a process for hardening steel (2) Rendering plastic materials (such as clay) homogeneous Cf *annealing* **t oil** A heavy viscous oil used for cooling metals during the tempering process

template An outline of an article to be constructed, made in thin wood, paper or metal, to serve as a pattern or guide

tempolabile Describing a substance that changes in the course of time, as, certain biological liquids

temulentine $C_{12}H_{42}O_{19}N$ = 504 3 An alkaloid from the seeds of *Lolium temulentum*, the darnel grass associated with wheat

temuline $C_7H_{12}ON_2$ = 140 1 An alkaloid from lolium, q v

tenacity Ability to hold fast, cf *tensile strength*

tenaculum A hook-shaped dissecting needle

tendering unit A measure of the tendering of fabrics by chemical attack (*e g* , in laundering) in terms of the cuprammonium viscosity in reciprocal poises

tengujo Yoshino

teniacide An agent that kills tapeworms, as, aspidium

teniafuge An agent that expels tapeworms, as spigelia, pomegranate

tenite Trade name for a cellulose aceto-butyrate plastic

tenith Trade name for a cellulose acetate plastic

Tennant, Charles 1768–1838 A Scotch industrial chemist noted for the original manufacture of chloride of lime

Tennant, Smithson 1761–1815 An English chemist noted for his discovery of iridium and osmium

tennantite $3Cu_2S\ As_2S_3$ A native copper sulfarsenite, with iron

tenorite CuO A native black oxide of copper

tensile Rigid **t strength** Tenacity The resistance which materials offer to a pulling action It is measured by the breaking stress of the substance in dynes per sq cm Some t s (kg /sq mm) are

flax fibers	60–110
steel	50–100
ramie fibers	70–80
rayon	60
copper	20–50
silk fibers	35–44
cotton fibers	28–44
rubber	15–20

tensimeter An instrument used to determine transition points by measuring small vapor-pressure changes

tensiometer An apparatus for measuring surface tension, q v

tension The stress caused by pulling or stretching, as, of rubber **adhesion-** The degree of wetting of a solid by a liquid **electric-** Electromotive force **gaseous-** The elasticity of a gas **surface-** The force exerted on the surface of a liquid, which causes the formation of a meniscus or the absence of froth It is due to the unequal attractions exerted upon one another by the molecules near the surface, and in the liquid **vapor-** See *vapor tension*

tenth-meter 10^{-10} m or 1 Ångström unit

tenth-normal solution N/10 or 0 1 N, decinormal A solution that contains 0 1 of the equivalent weight of a substance per liter

tephigram An entropy-temperature diagram

tephroite Mn_2SiO_4 A manganese silicate

tephrosal $C_{10}H_{16}O$ = 152 1 A volatile, liquid ketone from tephrosia, slightly soluble in water, soluble in alcohol, ether or benzene

tephrosia (1) Devil's shoe-string, Turkey pea The dried leaves of *T virginiana*, a Leguminosae, used medicinally as a cathartic (2) Fish bean, uwuwa, ombwe The leaves of *T vogelii*, a Leguminosae of N Rhodesia, used as fish poison and parasiticide

tephrosin $C_{23}H_{22}O_7$ = 410 15 Hydroxydequelin A crystalline principle from *tephrosia, derris* and *cube*, q v Colorless, short, thick prisms, m 198, insoluble in water, soluble in alcohol, ether or glycerol

ter- A prefix derived from the Latin indicating thrice or threefold Cf *tri-*

teraconic acid $C_7H_{10}O_4$ = 158 12 *2*-isopropylidene butanedioic acid* The crystalline solid $Me_2C\ C(COOH)\ CH_2COOH$, soluble in water, alcohol or ether, m 162 (decomp)

teracrylic acid $C_7H_{12}O_2$ = 128 09 $\beta\gamma$-dimethylpentenic acid A liquid, m −18, b 218

teratolite A mixed, native oxide of iron and manganese, with decomposed feldspar

terbium Tb = 159 2 A rare earth metal and element, atomic number 65, discovered by Mosander in gadolinite **t chloride** $TbCl_3$ = 265 6 A colorless, crystalline powder, readily soluble in water or alcohol **t hydroxide** $Tb(OH)_3$ = 210 2 A colorless powder, soluble in dilute acids **t nitrate** $Tb(NO_3)_3$ = 345 2 A white powder, soluble in water, decomp by heat to Tb_2O_3 **t oxide** Tb_2O_3 = 366 4 An amorphous white powder, soluble in dilute acids **t sulfate** $Tb_2(SO_4)_3$ = 606 5 Colorless crystals, soluble in water

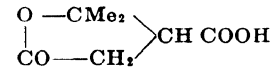
terchloride Trichloride

terebene $C_{10}H_{16}$ = 136 18 A mixture of terpenes from turpentine A yellowish, fragrant liquid, b 160–172, insoluble in water, soluble in alcohol, used as an antiseptic

terebenthene Turpentine

terebentylic acid $C_8H_{10}O_2$ = 138 12 A liquid, $d_0°$ 0 87, b 160

terebic acid $C_7H_{10}O_4$ = 158 1 Terebinic acid, *2 2*-dimethyl paraconic acid An oxidation-product of turpentine



Colorless crystals, m 175 Cf *terpenylic acid* **pyro-** Pyroterebic acid

terebinic acid Terebic acid

terebinthina Turpentine

terephthalal, terephthalyl The tetravalent radical, =CH C_6H_4 CH=

terephthalic Pertaining to p-phthalic acid **t acid** $C_8H_6O_4$ = 166 1 Benzene-p-dicarboxylic acid, $C_6H_4(COOH)_2$ The para-isomer of phthalic acid A white powder, sublimes when heated, insoluble in water, slightly soluble in alcohol, used as a reagent for alkali in wool **t aldehyde** $C_8H_6O_2$ = 134 1 Benzene-p-dialdehyde, $C_6H_4(CHO)_2$ Colorless needles, m 116, b 245, soluble in water or alcohol **t nitrile** $C_8H_4N_2$ = 128 1 p-Dicyano-benzene, $C_6H_4(CN)_2$ Colorless crystals, m 215, insoluble in water, slightly soluble in alcohol or ether

terephthalonic acid Carboxyformyl benzoic acid

terephthalyl alcohol $\alpha\alpha'$-*p*-Xylenediol

teresantalic acid $C_{15}H_{26}O_2$ = 143 1 An acid of the terpene series, in sandalwood oil

terlinguaite Hg_2ClO A native oxychloride of mercury

term A mathematical relation **D-** The diffuse lines in the spectrum **P-** the principal lines in the spectrum **S-** The sharp lines in the spectrum See *hydrogen atom, orbits, atomic structure, series*, and *state* **t system** See *quantum numbers*

terminal The end of an electric wire or electrode or a binding post for it

terminalia Myrobalan

terminology (1) A branch of science that deals with the construction, definition and arrangement of names and terms (2) A nomenclature **Geneva-** See *Geneva* **organic-** See *organic compounds, ring systems, radicals, structure symbols*

termolecular Trimolecular

ternary (1) Consisting of three (2) Tertiary **t compound** A molecule that consists of three different types of atoms **t steel** A steel consisting of iron, carbon and one other metal **t system** A system of three components

ternitrate Trinitrate

teroxide Trioxide

terpadiene A derivative of terpane (methane), containing two double bonds

terpadienone A derivative of terpanone containing two double bonds, generally $C_{10}H_{14}O$, as, carvone

terpane Methane

terpanone A saturated ketone, $C_{10}H_{18}O$, derived from terpenes, as, tetrahydrocarvone

terpene (1) A hydrocarbon of the general formula, $C_{10}H_{16}$, in essential oils, resins and other vegetable aromatic products Classification
A *Monocyclic*—cymene-group, isomers of hexahydrocymene or menthane, limonene
B *Bicyclic*—carene, pinene, camphene group
C *Acyclic*—aliphatic terpenes
Related to the terpenes are compounds with one-half, one and one-half, two or more times, the molecular weight of the terpenes These are

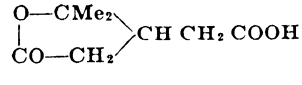
hemiterpenes as pentadiene, isoprene	C_5H_8
terpenes as bornylene, camphene, carene, dipentene, fenchene, geranene, limonene, myrcene, ocimene, phellandrene, pinene, sabinene, sylvestrene, terpinene, thujene	$C_{10}H_{16}$
sesquiterpenes as cadinene, cannibene, caryophyllene, cedrene, clovene, guajene, patchoulene, santalene, selinene, zingiberene	$C_{15}H_{24}$
diterpenes	$C_{20}H_{32}$
polyterpenes	$n(C_{10}H_{16})$

Cf *projection nucleus, symmetry* (2) A derivative of the related cyclic or unsaturated hydrocarbons, $C_{10}H_{14}$, $C_{10}H_{18}$ and $C_{10}H_{20}$, as, pinane, pinol, menthol, ionone (3) $C_{10}H_{16}$ = 136 1 Dipentene, d l-limonene, cinene, cajeputene, kautchin, diamylene A liquid hydrocarbon in the oils of bergamot, geranium, citronella, dill, caraway, wormseed and other essential oils A colorless liquid, d 0 85, b 181, insoluble in water, alcohol or ether, used for flavoring purposes, as an anthelmintic, antispasmodic and anodyne **t dihydrochloride** $C_{10}H_{16}$ 2HCl = 209 0 Dipentene dihydrochloride A colorless crystalline substance, m 50, insoluble in water, soluble in alcohol, ether or benzene **t hydriodide** $C_{10}H_{16}$ HI = 264 1 Dipentene iodide, terpene iodide A reddish-brown liquid, insoluble in water, soluble in alcohol, ether or benzene **t hydrochloride** $C_{10}H_{16}$ HCl = 172 6 Dipentene hydrochloride, pinene hydrochloride, artificial camphor, turpentine camphor A colorless crystalline mass, m 125, b 208, insoluble in water, soluble in alcohol, used medicinally as an antiseptic

terpenol A group of cyclic alcohols, $C_{10}H_{17}OH$, derived from the terpenes, as, carvestrol

terpenone A group of ketones, $C_{10}H_{16}O$, derived from terpanones, as, dihydrocarvone

terpenylic acid $C_8H_{12}O_4$ = 172 1 An oxidation-product of turpentine and the monobasic acid

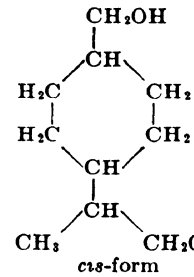


Colorless crystals, m about 90 (see *terebic acid*)

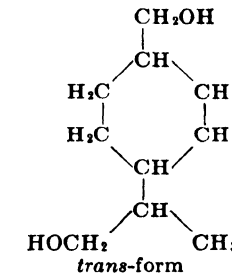
terpilene $C_{10}H_{16}$ = 136 1 Terpinylene A terpene obtained by dehydrating a terpene dihydrochloride solution A clear liquid, d 0 852, b 176 **t dihydrochloride** Eucalyptole

terpilenol Terpineol

terpin, terpine $C_{10}H_{20}O_2$ = 172 2 Dipentene-glycol, dihydroxymenthane A diatomic alcohol, two isomers



cis-form
m 104
b 258

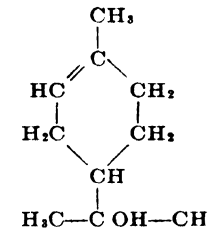


trans-form
m 156
b 263

t hydrate $C_{10}H_{20}O_2$ H_2O = 190 23 Colorless rhombic crystals, m 106, b 258, soluble in water, alcohol or ether It is obtained by oxidation of turpentine, used medicinally for whooping cough

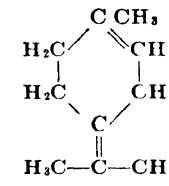
terpinene $C_{10}H_{16}$ = 136 2 A hydrocarbon from turpentine It exists in an alpha- and beta-form A colorless liquid, d 0 865, b 179, insoluble in water, soluble in alcohol or ether

terpineol $C_{10}H_{18}O$ = 154 2 Lilacin, terpilenol A clear, colorless liquid (α-) d 0 936, m 35, b 219 8, (β-) d 0 923, m 33, b 210, (γ-) d 0 936, m 70, b 218, insoluble in water, soluble in alcohol or ether It has a lilac odor, used in perfumery



terpinol A mixture of terpenes forming a colorless, oily liquid of hyacinth odor, insoluble in water, soluble in alcohol Used as an antiseptic, in perfumery, soap manufacture, and medicinally

terpinolene $C_{10}H_{16}$ = 136 2 The hydrocarbon,



A colorless liquid, m 15, b 183, insoluble in water, soluble in alcohol, ether or glycerol Cf *citral, citronellal*

terpinylene Terpilene

terpyridyl 2 6-di-2′-pyridyl pyridine A solution in HCl is a reagent for Co (orange color)

terra- A prefix indicating an earth or earthy origin **t alba** A white clay or kaolin **t cariosa** Rotten stone **t cotta** A coarse clay or plastic earth, baked and used for decorative purposes or utensils It is of better quality than brick **t rossa** A fossil red earth **t japonica** Pale catechu or gambir **t verde** Green earth A pale-green disintegration-product of hornblende minerals, used to fix basic dyes on textiles

terracoles A group of lichens

terrein $C_8H_{10}O_3$ = 154 0 A hydroxycyclopentanone produced by the mold *Aspergillus terreus*

tersulfate A sulfate containing three sulfate radicals

tert- An abbreviation and prefix indicating *tertiary*

tertiary Third in order of type **t alcohol** An organic compound of the type, $R_3C\,OH$ **t amine** An organic compound of the type, R_3N, as, trimethylamine Me_3N **t carbon atom** A carbon atom that is attached to three other carbon atoms **t epoch** A geologic period (q v) and system of strata deposited during the cenozoic era **t lipid** See *lipids* **t phosphate** The normal phosphate, M_3PO_4

tervalent Having three different valencies

tesseral Same as isometric or cubic (crystals) Cf *crystal system*

test (1) A qualitative trial, or reaction, *e g* , for the identification of a substance (2) A physical experiment designed to determine the physical properties of a substance or material **biological-** A serum reaction **generic-** q v **hot toddy-** An evaluation of *aroma*, by treating 10 cc liquors with 40 cc hot water and lightly smelling it in comparison with a standard, *flavor* sip and roll the liquid over the tongue without swallowing If many tests are to be made chew an olive between tests and breathe fresh air **layer-** Ring t **load-** The subjection of a material to different pressures or weights and temperatures, and measurement of the resulting deformation **negative-** q v **ordinal-** q v **ring-** A chemical reaction between two liquid layers, so that the reaction-products form a zone between them **slag-** An examination of refractories for their behavior towards slag penetration The slag should break from the walls cleanly **spalling-** The behavior of heated materials after repeated quenching in water **spot-** q v **streak-** q v **t glass** Test tube **t meal** See *test-meal* **t paper** A filter paper impregnated with a solution of a reagent or an indicator (see table) Used to determine (1) the presence of certain substances in a solution which must not be contaminated by the addition of the reagent itself, (2) the acid or basic character of a solution **t solution** T S A solution of reagent **t tube** A small cylindrical glass vessel of resistant glass, used for chemical reactions

TEST PAPERS

Congo Red	with OH^- red with H^+ blue (pH3–5)
Lead acetate	with H_2S black
Litmus blue	red with H^+
Litmus red	blue with OH (pH 4 5–8 3
Litmus neutral	red with H^+ (sensitive to 0 001N
	blue with OH^-
Methyl orange	red with H^+ yellow with OH^-, pH 3 1 4 4
Nitrazine	at pH 4 5—yellow 6 0—olive 6 5—green 7 5—blue
Phenolphthalein	red with OH white with H^+ pH 8 3 10
Potassium iodide	red with Hg salts
Potassium iodide-starch	blue with oxidizing agents
Starch	blue with iodine
Turmeric	red with OH (sensitive to 0 004N) or borates

testa A shell, as, testa ovi (egg shell)

testes The dried substance of the testes of the steer, used medicinally for neurasthenia and diabetes

test-meal The specially-prepared food that is eaten, withdrawn from the stomach after a certain time, and then analyzed

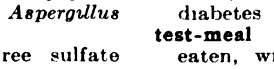
testosterone A male sex hormone, m 154, from testis tissue, or synthesized Cf *androsterone, cholane derivatives*

tetanics A poison that chiefly affects the spinal cord and produces spasmodic contractions of the muscles, as, nux vomica ignatia, thebaine

tetanine $C_{13}H_{30}O_4N_2$ = 288 2 A ptomaine from cultures of the tetanus bacillus

tetanotoxin $C_5H_{11}N$ = 85 1 A ptomaine from cultures of the tetanus bacillus

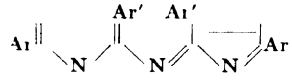
tetanthrene $C_{14}H_{14}$ = 182 11 Tetrahydrophenanthrene The aromatic hydrocarbon



tetartohedral A crystal form which exhibits only one quarter of the full number of faces required by the symmetry of the system

tethelin A principle obtained from the anterior lobe of the pituitary body It is supposed to control the growth of an organism

tetra- Quadri- A prefix derived from the Greek, indicating 'four" **t arylazadipyrromethines** Stable dyestuffs made by the progressive replacement of methine bridges in porphins to form azaporphins and finally phthalocyanines (q v) e g



tetrabasic Describing an acid that has four replaceable hydrogen atoms as H_4SiO_4

tetrabenzyl- A prefix indicating four benzyl radicals **t tin** $Sn(CH_2Ph)_4$ = 482 92 Colorless prisms, m 42 5, insoluble in water, soluble in organic solvents

tetraborane B_4H_{10} = 53 3 A boron hydride, q v

tetraborate A salt of tetraboric acid of the type, $M_2B_4O_7$, as, $Na_2B_4O_7$ borax or sodium tetraborate

tetraboric acid See *boric acid* (pyro-)

tetrabrom-, tetrabromo- A prefix describing a compound containing four bromine atoms in its molecule **t benzene** 1 2 3 5- or 1 3 4 5- $C_6H_2Br_4$ = 393 73 Soluble in ether, insoluble in alcohol m 98 5 b 329 **t cresol sulfonphthalein** Bromcresol green **t ethane** $C_2H_2Br_4$ = 345 8 Ethylene tetrabromide, $CHBr_2$-$CHBr_1$ A colorless liquid d 2 972, m −20 insoluble in water, soluble in alcohol or ether, used in organic synthesis **t fluorescein** Eosin **t phenolsulfonphthalein** Bromphenol blue

tetracarboxylic acid A tetrabasic organic acid containing four COOH radicals, as,
ethanetetracarboxylic acid or dimalonic acid $CH(COOH)_2\,CH(COOH)_2$
propanetetracarboxylic acid or methylenedimalonic acid, $CH(COOH)_2\,CH_2\,CH(COOH)_2$
butanetetracarboxylic acid, or ethylenedimalonic acid, $CH(COOH)_2\,CH_2\,CH_2\,CH(COOH)_2$

tetracetate A compound containing four acetate radicals, $(CH_3COO)_4M$

tetrachloro-, tetrachlor- A prefix describing a compound containing four chlorine atoms in its

molecule **t acetone** $C_3H_2OCl_4$ = 195 86 Di-dichlormethyl-ketone, $(CHCl_2)_2CO$ Colorless crystals, m 48 **t aniline** $C_6HCl_4NH_2$ = 230 9 **2 3 4 5-** 1-Amino-tetrachlorobenzene Colorless crystals, m 118, insoluble in water, soluble in alcohol or ether **2 3 5 6-** m 90 **t benzene** $C_6H_2Cl_4$ = 215 9 **1 2 3 4-** Colorless needles, m 45, b 254, insoluble in water, soluble in alcohol or ether **1 2 4 5-** Colorless monoclinic crystals, d 1 858, m 140, b 243 slightly soluble in water, soluble in alcohol or ether **1 2 3 5-** White needles, m 50, b 246 insoluble in water, soluble in alcohol **t ethane** $C_2H_2Cl_4$ = 167 87 Acetylenetetrachloride, ethylenetetrachloride **1 1 2 2-** or $\alpha\alpha\beta\beta$- CH_2Cl—CH_2Cl A colorless liquid, d 1 600, m −43 8 b 146 3, insoluble in water, miscible with alcohol or ether Used as a solvent for fats and waxes for airplane dope, for cleaning metals as a paint remover, spotting agent insecticide, and in organic synthesis **1 1 1 2-** or $\alpha\alpha\alpha\beta$- CH_2Cl—CCl_3 A colorless liquid, d 1 5825, b 129 **t ethylene** C_2Cl_4 = 165 84 Perchloroethylene CCl_2 CCl_2 A colorless liquid d 1 608, m −19 b 119, insoluble in water, soluble in alcohol or ether Used as a spotting and drying agent soap solvent, and solvent for fats and waxes **t methane** Carbon tetrachloride **t quinol** Chloranil

tetrachloride A compound that contains four chlorine atoms in its molecule as, $SnCl_4$

tetracid A base that contains four hydroxyl radicals, or an alcohol with four OH groups

tetracol Trade name for carbon tetrachloride

tetracosane $C_{24}H_{50}$ = 338 4 A hydrocarbon of the paraffin series Colorless crystals m 51 insoluble in water, soluble in alcohol or ether

tetracosanic acid* $C_{24}H_{48}O_2$ = 368 37 A fatty acid, m 84 2 from peanut oil **iso-** A fatty acid, m 80, from Swedish pine oil

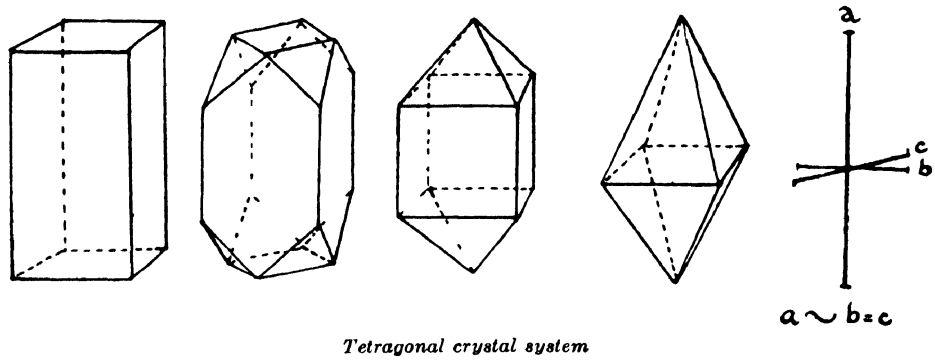
tetradymite Bi_2Te_3 Tellurbismuth A native bismuth telluride, which usually contains some sulfide

tetraedrite A native arsenic and copper sulfide, intermediate in composition between tennantite and tetrahedrite

tetraethyl- A prefix describing a compound containing four ethyl groups in its molecule **lead-** See tetraethyl *plumbane* and *tetraethyl gas* **t ammonium hydroxide** $C_8H_{21}ON$ = 147 1 NEt_4OH Colorless, hygroscopic, hairlike needles, m 50, soluble in water Used medicinally as an antirheumatic or uric acid solvent **t ammonium iodide** $C_8H_{20}NI$ = 257 2 NEt_4I Yellowish crystals soluble in water or alcohol **t benzene** $C_{14}H_{22}$ = 190 2 The aliphatic-aromatic hydrocarbon $C_6H_2Et_4$ **1 2 3 4-** A colorless liquid d 0 888, m 13, b 254, insoluble in water, soluble in alcohol, ether or benzene **1 2 4 5-** A colorless liquid, d 0 887, b 250 **t gas** A "knockless" gasoline for automobiles, which contains a small amount of lead tetraethyl Cf *knock* **t germanium*** $GeEt_4$ = 188 76 Colorless liquid, d 0 991 m −90, b 163, insoluble in water **t lead*** Tetraethyl *plumbane* **t tin*** $SnEt_4$ = 234 86 Ethylstannane Colorless liquid, d 1 187, m −112, b 181, insoluble in water **t urea** $C_9H_{20}ON_2$ = 172 18 $Et_2N\,CO\,NEt_2$ A colorless liquid, b 210, soluble in water or alcohol

tetragalloyl- A prefix indicating four $C_6H_2(OH)_3CO$— radicals, from gallic acid **t erythrite** $C_{32}H_{26}O_{16}$ = 730 2 $C_4H_6O_4[C_6H_2(OH)_3CO]_4$ White crystals, decomp 308, slowly soluble in water, alcohol, or acetone

tetragonal Describing a crystal having its three axes at right angles to each other, two of the axes are of equal length the third is shorter or longer (see illustration)



Tetragonal crystal system

tetrad (1) An atom or group of atoms that has a valency of four (2) In crystallography A crystal which exhibits four similar faces when rotated about its axis of symmetry through 360°

tetradecane* $C_{14}H_{30}$ = 198 24 A hydrocarbon of the methane series A colorless liquid, d 0 765, m 5, b 253, insoluble in water, soluble in alcohol or ether

tetradecanoic acid* Myristic acid

tetradecoic acid Myristic acid

tetradecyl The monovalent radical, $—C_{14}H_{29}$, derived from tetradecane

tetradecylene $C_{14}H_{28}$ = 196 29 A hydrocarbon, soluble in alcohol, m −12, b $_{15mm}$ 127

tetrahedral Pertaining to a tetrahedron, cf *tetrahedronal*

tetrahedrite Cu_2SbS_3, or $3Cu_2S\,Sb_2O_3$ Panabase, fahlerz, gray copper ore A native copper antimony sulfide Cf *aphthonite, schwatzite, tetraedrite*

tetrahedron A crystal of the isometric system, which has four equal faces, as, a pyramid

tetrahedronal Tetrahedral Resembling a tetrahedron **t atom** A static atom in which the electron octet is divided into four pairs of electrons which oscillate around centers located as the four corners of a tetrahedron Cf *Lewis atom* **t carbon** A model of the C atom, generally used to illustrate the directions of the bonds, as,

single bond tetrahedrons touching on corners, double bond tetrahedrons touching on edge, triple bond tetrahedrons touching on face, These correspond, respectively, with one, two, or three pairs of electrons held in common by the two C atoms

tetrahexahedron A crystal of the isometric system that has 24 equal faces, four on each face of a cube

tetrahydro- A prefix describing a compound that contains four hydrogen atoms in excess of the formula indicated by its suffix-name An unsaturated compound whose molecule has been saturated with four hydrogen atoms **t benzene** C_6H_{10} = 82 11 $C_6H_6H_4$ A colorless liquid, b 82 **t benzoic acid** See *benzoic acid* **t butene** Tetramethylene **t furan** Butylene oxide **t naphthalene** Tetralin **t naphthol** $C_{10}H_{12}O$ = 148 15 C_6H_8OH-$(CH_2)_4$ A solid, m 69 b $_{716mm}$ 264, fairly soluble in water, very soluble in alcohol or ether **t naphthylamine** $C_{10}H_{11}NH_2$ = 147 2 *alpha-* aryl- A colorless oil, b 277, soluble in alcohol *beta-* acyl- A colorless liquid, d 1 034 b 251, soluble in alcohol **t phenol** $C_6H_{10}O$ = 98 11 $C_6H_8OHH_4$ A liquid, b 166, soluble in water **t quinoline** $C_9H_{11}N$ = 133 1 A hydrogenation product of quinoline, C_6H_4 A colorless crystalline mass or liquid, d 1 063, m 20, b 251, soluble in water, alcohol or ether, used in organic synthesis *iso-* C_6H_4 A yellow liquid, b 232, soluble in water, alcohol or ether **t thiazoles** Thiazolidines **t tubanol** q v

tetrahydroform Trimethylenimine

tetrahydroxy- A prefix that indicates four hydroxy groups **t benzene** (1 2 4 5) C_6H_2-$(OH)_4$ = 142 1 Colorless leaflets, m 215, soluble in water, alcohol or ether **t benzoic acid** $C_6H(OH)_4COOH$ = 186 1 A solid, m-148 **t quinone** $C_6H_4O_6$ = 172 06 A soluble solid **t stearic acid** $C_{18}H_{36}O_6$ = 348 4 Sativic acid A white purgative powder in strophanthus oil

tetraiodo- A prefix that indicates four iodine atoms **t-ethylene** C_2I_4 = 531 73 CI_2-CI_2 An odorless, colorless, crystalline powder, m 187, used as an antiseptic **t phenolphthalein** $C_{20}H_8I_4N_4Na$ A bluish powder, soluble in water, used as a radiopaque medium **t pyrrole** Iodol

-tetraketone A suffix indicating four =CO groups, as, diphenyl t Cf *tetrone*

tetrakis hexahedron A form of the regular crystal system, (4-faced cube)

tetralin $C_{10}H_{12}$ = 132 15 Tetrahydronaphthalene A colorless liquid, d 0 917, b 205, insoluble in water, soluble in alcohol or ether Used as a solvent for resins, waxes, fats and oils, as a substitute for turpentine, and in motor fuels Cf *dekalin*

tetralite Tetryl

tetramethyl- A prefix that indicates the presence of four methyl groups **t ammonium** A group of organic compounds of the type, $N(CH_3)_4X$, as,

$N(CH_3)_4Br$—t bromide
$N(CH_3)_4Cl$—t chloride
$N(CH_3)_4OH$—t hydroxide
$N(CH_3)_4I$—t iodide

t ammoniumformate Forgenin **t ammoniumhydroxide** NMe_4OH = 91 13 A soluble solid, decomp by heat **t benzene** $C_{10}H_{14}$ = 134 1 The hydrocarbon, $C_6H_2Me_4$ **1 2 3 4-** A colorless liquid, d 0 882, m −4, b 204, insoluble in water soluble in alcohol, it is an isomer of prehenitol **1 2 4 5-** Durene **6 1 2 4-** Isodurene **1 2 3 5-** Isodurene **t diamino benzhydrol** *Michler's hydrol* **t diaminobenzophenone** See *Michler's ketone* **t diaminodiphenylmethane** See under *diphenylmethane* **t diaminotriphenylmethane** Leucomalachite green **t lead*** $PbMe_4$ = 267 31 A colorless liquid, d 1 995, m −27 5, b 110, insoluble in water **t oxamide** $(CONMe)_2$ White crystals, m 80 **t p-phenylene diamine** Wurster's blue **t tin*** $SnMe_4$ = 178 79 A colorless liquid, d 1 314, b 78, insoluble in water, soluble in organic solvents

tetramethylene (1) C_4H_8 = 56 06 Tetrahydrobutene Cyclobutane, cyclotetramethylene, Many derivatives are known

amino tetramethylene, $C_4H_7NH_2$, b 81
hydroxy tetramethylene, C_4H_7OH, b 123
methyl tetramethylene, C_4H_7Me, b 39
(2) 1 4-butylene The divalent radical —CH-$CH_2CH\ CH_2$—, as in
tetramethylene amine, $H(CH_2)_4NH_2$,
tetramethylene diamine, NH_2-$(CH_2)_4$—NH_2, putrescine
(3) compound containing four CH_2= radicals **t amine** Aminobutane **t diguanidine** Arcaine **t glycol** 1 4-Butanediol **t imine** Pyrrolidine **t oxide** Butylene oxide **t sulfide** Butylene sulfide

tetramethylethyleneketone Pinacone

tetramethylleucaniline $C_{23}H_{27}N_3$ = 345 25 $(Me_2NC_6H_4)_2CH\ C_6H_4NH_2$ Lustrous crystals m 151 soluble in alcohol, used in organic synthesis

tetramethylmethane C_5H_{12} = 72 1 *Tert*-pentane 2,2-dimethylpropane CMe_4 A colorless liquid and isomer of pentane

tetramethylurea $C_5H_{12}ON_2$ = 116 1 Me_2N-CO N Me

tetramido Containing four amino groups and one or more oxygen atoms

tetramine An organic compound containing four amino nitrogens, as, hexamethylenetetramine, $(CH_2)_6(NH_4)$ Cf *tetrammine, amines*

tetramino- A prefix indicating the presence of four amino groups $R(NH_3)_4$

tetrammine A metallic compound of the type $M(NH_3)_4X_3$, where M is a trivalent metal (as Co or Cr) and X a halogen Cf *tetramine, ammines*

tetramolecular A reaction of the fourth order, in which four molecules undergo a change

tetramorphism Crystallizing in four different crystal systems, as, phosphorus

tetrandrine (1) $C_{19}H_{22}NO_3$ = 313 19 An alkaloid, m 217 from *Stephania tetrandra*, a Menispermaceae Cf *codethyline* (2) $C_{38}H_{42}O_6N_2$ = 622 3 An alkaloid from the Chinese drug hanfengchi

tetrane Butane

tetranitrate A compound containing four —NO_3 radicals, as, erythroltetranitrate

tetranitro- A prefix indicating a compound containing four —NO_2 radicals **t aniline** C_6H_3-N_5O_8 = 273 06 T N A $NH_2C_6H(NO_2)_4$

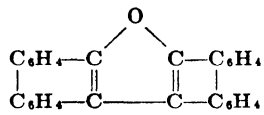
A high explosive d 1 89, m 170, exploding at 237 **t anthraquinone** Aloetic acid **t chrysazin** Chrysammic acid **t diphenyl** $C_{12}H_6(NO_2)_4$ = 334 1 Colorless crystals, m 140, insoluble in water, soluble in alcohol or ether It is used in organic synthesis **t diphenylmethane** $C_{13}H_8(NO_2)_4$ = 348 2 Yellow prisms, m 172, insoluble in alcohol or ether, used in organic synthesis **t methane** $C(NO)_4$ = 196 1 A colorless liquid, d 1 650, m 13, b 126 (decomp), insoluble in water, soluble in alcohol or ether It is a color reagent for unsaturation in organic compounds **t methylaniline** Tetryl **t naphthalene** $C_{10}H_4(NO_2)_4$ = 308 12 **1 4 5 8-** alpha- Yellow rhombic crystals, m 257 explodes when further heated, slightly soluble in water, alcohol or ether **1 3 6 8-** Long needles, m 203, explodes when further heated, insoluble in water **1 3 5 8-** Yellow tetragonal crystals, m 194 soluble in water, alcohol or ether, used in organic synthesis **t phenol** $C_6H(OH)(NO_2)_4$ = 274 1 1-hydroxy-2 3 4 6-tetranitro-benzene Yellow needles, m 130, explode when further heated, soluble in water, alcohol or ether **t phenosulfonphthalein** A pH indicator changing from yellow (acid) to magenta (alkaline)

tetranitrol Erythrol tetranitrate

tetranthera The bark of *Tetranthera citrata*, a Lauraceae

tetraphenyl Describing a compound containing four phenyl groups ($-C_6H_5)_4$, as, tetraphenylethane or lead tetraphenyl **t ethane** $C_{26}H_{22}$ = 334 3 The hydrocarbon $\alpha\alpha\beta\beta$-$CHPh_2$-$CHPh$ Colorless crystalline needles, d 1 182, m 209, b 360, insoluble in water, soluble in alcohol, ether or acetic acid **t ethylene** $C_{26}H_{20}$ = 332 2 The hydrocarbon, Ph_2C-CPh_2 Colorless monoclinic crystals m 221, b 415 insoluble in water, soluble in alcohol or ether **t lead*** $PbPh_4$ = 515 38 White needles, m 228, soluble in benzene **t methane** $C_{25}H_{20}$ = 320 15 CPh_4 Colorless crystals, m 285 b 431 **t silicon** $C_{24}H_{20}Si$ = 336 2 The silane $SiPh_4$ Colorless crystals, m 228, b 300, insoluble in water **t succinic acid** $C_{28}H_{22}O_4$ = 422 2 Tetraphenylethanedicarboxylic acid, $Ph_2C(COOH)$ $C(COOH)Ph_2$ Colorless crystals, m 261 **t tin*** $SnPh_4$ = 426 86 Tetragonal crystals, d 1 490, m 226, insoluble in water, soluble in organic solvents **t urea** $C_{25}H_{20}ON_2$ = 364 17 Ph_2N CO - NPh_2 Colorless crystals, m 183, insoluble in water

tetraphenylene Describing a compound containing four phenylene groups, $(=C_6H_4)_4$, as, tetraphenylene furfurane **t furfurane** $C_{28}H_{16}O_2$ = 368 2 The heptacyclic compound,

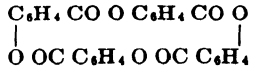


tetraphenyltin See *tin tetraphenyl*

tetraphosphorus monoselenide P_4Se = 203 34 An insoluble solid, m 166

tetrasaccharide A carbohydrate which can be hydrolyzed to four monosaccharides, as lupeose, stachyose

tetrasalicylide $C_{28}H_{16}O_8$ = 480 13



tetrasilane Si_4H_{10} = 122 32 A hydride of silicon, SiH_3 SiH_2 SiH_2 SiH_3 An unstable liquid, m −94, b 90

tetrathionate A salt of the type $M_2S_4O_6$, soluble in water, insoluble in alcohol

tetrathionic acid $H_2S_4O_6$ = 226 0 A polythionic acid obtained by the action of iodine on thiosulfates When heated it decomposes into sulfuric acid, sulfur dioxide and sulfur It can exist only in dilute solutions

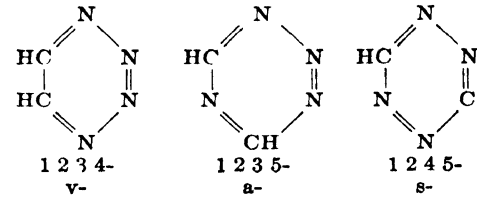
tetratomic Describing (1) A molecule consisting of four atoms, as, NH_3, (2) A compound that has in its molecule four hydroxyl groups, as, $M(OH)_4$ or $R(OH)_4$

tetravalent Describing an atom or group of atoms that has a valency of four (Cf *quadrivalent*)

tetrazone* A derivative of bihydrazine (q v) H_2N NH NH NH_2 (See *tetrazone, tetrazo-*)

tetrazene* A derivative of NH N NH NH_2 Cf *tetrazane*

tetrazine $C_2H_2N_4$ = 82 2 The heterocyclic compounds,

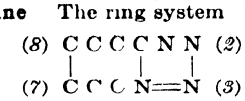


1 2 3 4- v- 1 2 3 5- a- 1 2 4 5- s-

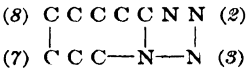
symmetric- Dark red prisms, m 99, insoluble in water, soluble in alcohol **vicinal-** Oxotetrazone, known only in its derivatives

tetrazo- Bisazo, bisdiazo A prefix indicating two azo groups, (—N - N—)$_2$, as, bisdiazoamine (tetrazoamine), bisdiazohydrazine (tetrazohydrazine)

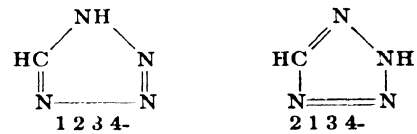
tetrazolazocine The ring system



tetrazolazonine The ring-system



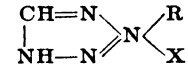
tetrazoles CH_2N_4 = 70 06 The heterocyclic compounds,



1 2 3 4- 2 1 3 4- (or 1 2 3 5-)

Soluble in water, alcohol or ether, m 156 (sublimes) Two types of derivatives **C-**, when the substituting radical is on the carbon atom, **N-**, when the substituting radical is on the nitrogen atom **azo-** q v **benzo-** q v **bis-** q v **diazo-** q v **phenyl-** q v **pyrro-** q v

tetrazolium A tetrazole derivative in which one nitrogen atom is pentavalent, as,

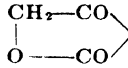


tetrazone An organic compound of the type, R_2N N N NR_2, obtained by the action of

yellow mercuric oxide on asymmetric dialkylhydrazines They are strong reducing agents in an acid solution Cf vicinal *tetrazine*

tetrazotic acid $(CH_2)N_4$, known only in derivatives Cf *tetrazole, tetrazyl*

tetrazyl The monovalent radical, $—HCN_4$, derived from tetrazole **t hydrazine** CN_4-$NH\ NH_2$ = 99 08 Yellow crystals, m 199

tetronic acid $C_5H_6O_3$ = 114 05 α-methyltetronic  Colorless crystals, n 189 (Cf *pentinic* and *hexinic acids*)

tetrodonine A curare-like poisonous principle, fugin, obtained from the roe of Japanese fishes of the genus, Tetrodon

tetrole Furan

tetrolic acid $C_4H_4O_2$ = 84 1 Butynoic acid* The unsaturated acid $MeC\ C\ COOH$ Colorless leaflets, m 76, b 203, soluble in water alcohol or ether **t a series** See *acetylene acids*

tetronal $C_9H_{20}S_2O_4$ = 256 3 Diethylsulfonediethylmethane, *3 3*-bisethylsulfonyl pentane*, $Et_2C(SO_2Et)_2$ Lustrous leaflets, m 85, slightly soluble in water soluble in alcohol or ether Used medicinally as a hypnotic and sedative, but it may cause hematoporphyrin to appear in urine

-tetrone A suffix indicating four =CO groups, as, anthracene t Cf *-tetraketone*

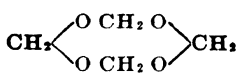
tetronerythrin A red pigment from the feathers of birds

tetronic acid $C_4H_4O_3$ = 100 03 The pentacyclic compound, Colorless crystals, m 141, soluble in alcohol **ethyl-** Pentinic acid **methyl-** Tetrinic acid **propyl-** Hexinic acid

tetrophan Trade name for dihydro benzacridine carboxylic acid

tetrose $C_4H_8O_4$— A group of monosaccharides that contain four carbon atoms Four isomers

d- and l-erythrose
d- and l-threose

tetroxane $C_4H_8O_4$ = 120 1 The heterocyclic compound, 

tetroxide A binary compound that contains four oxygen atoms

tetryl $C_7H_5N_5O_8$ = 287 08 Tetranitromethylaniline, methylnitropicramide, tetralite, *2 4 6*-trinitrophenylmethylnitramine, $(NO_2)_3C_6H_2$-$NMe\ NO_2$ Yellow powder, m 130, exploding 187 Used as an explosive in detonators and as a primer for less sensitive explosives

teucrin $C_{31}H_{24}O_{11}$ = 452 2 A glucoside from germander, *Teucrium frutrcans*, a labiate plant Used in the treatment of tuberculosis

teucrium (1) Cat thyme, Syrian mastic The dried herb of *Teucrium marum*, a Labiatae It contains an essential oil, camphor, resin and glucoside A sterilized extract is used in ampoule medication (2) *T chamaedris* Germander, q v (3) *T scordium* Water *germander*

textile A woven cloth or fabric **t chemistry** The methods of dyeing and finishing, and the chemical and microscopical examination of fabrics and yarns

TEXTILES, SOLUBILITY

	Per cent solubility in			
	Acetone	NaOH	H_2SO_4	Calcium thiocyanate solution
Wool	0	100	0	3
Silk	0	100	0	100
Cotton	0	3 5	100	2
Cotton mercerized	0	3 5	10	2
Acetate rayon	100	6	100	100
Viscose rayon	0	6	100	100

texture Coarse structure *E g*, the arrangement of rock particles and crystals that gives a stone its physical appearance, or of fibers in textiles or paper

tfol An argillaceous earth containing gelatinous silica, used in North Africa as a substitute for soap **t ointment** A mixture of 20 parts tfol and 100 parts tar, used medicinally as an antiseptic paste

Th The symbol for thorium **Th** Ω Hibernium **ThEm** Thoron **ThX** See *radioactive elements*

thalenite The mineral $2Y_2O_3,4SiO_2\ H_2O$

Thales of Miletus About 640–546 B C A Greek philosopher noted for his attempt to find a single material cause for all things To him is ascribed the saying that "Moisture is the principle of all life"

thalictrine $C_{20}H_{27}O_4N$ = 345 2 An alkaloid obtained from *Thalictrum macrocarpum*, or *T foliolosum* (Ranunculaceae) Colorless prismatic needles, m 208, insoluble in water and soluble in alcohol It is a cardiac poison and laxative

thalleoquine reaction A test for alkaloids in which a characteristic color is obtained on adding in succession chloroform, bromine water and sodium hydroxide

thallic Describing a compound containing trivalent thallium, Tl^{+++} (See *thallium compounds*) **t chloride** Thallium chloride (2)

thalline $C_{10}H_{13}ON$ = 163 2 Tetrahydro-p-quinanisol, tetrahydro-p-methoxyquinoline, C_9-$H_8N(OMe)\ H_4$ Colorless rhombic crystals, m 40, soluble in water, alcohol or ether It has a coumarin-like odor, and gives a deep green color with ferric chloride, hence its name (cf *thallium*) **t salicylate** $C_{10}H_{13}$-$ON\ C_7H_6O_3$ = 301 2 Reddish crystals, soluble in alcohol Used medicinally as an antiseptic and antipeptic **t sulfate** $(C_{10}H_{13}ON)_2\ H_2$-$SO_4\ 2H_2O$ = 460 4 Colorless crystals, m 110, soluble in water or alcohol, used medicinally as an antiseptic and antipyretic **t tartrate** $C_{10}H_{13}ON\ C_4H_6O_6$ = 313 2 White crystals, m 155, soluble in water, slightly soluble in alcohol Used medicinally as an antipeptic

thallium Tl = 204 39 A rare metal of the gallium-indium family, and element, atomic number 81 It is the lightest element having naturally-radioactive isotopes Cf *radioele-*

ments A bluish-white metal, d 11 862, m 303 5, b 1280, insoluble in water, soluble in nitric acid It was discovered in 1861 by Crookes and named from its green spectral line (Greek, thallein = green) It is widely distributed in nature, in small quantities, and is obtained from the lead chamber sludge by precipitation with zinc Thallium forms two series of compounds, and has valencies of one and three

Tl^{+}	Tl^{+++}
thallous-	thallic-

Its salts are all cumulative poisons In its chemical properties it is analogous to the alkali metals, lead, and aluminum The metal is used as a catalyst in the manufacture of azobenzene, as an antiknock compound, in optical glass, and as poison for ants and rodents Principal sources

crookesite (16–19 % Tl)	$(Cu, Tl, Ag)_2Se$
lorandite (59–60 % Tl)	$TlAsS_2$
hutchinsonite (18-25 % Tl)	$(Tl, Ag, Cu)_9S$
vrbaite (29–32 % Tl)	$TlAs_2S_5$

t acetate $TlC_2H_3O_2$ = 263 4 Thallous acetate Colorless hygroscopic crystals, d 3 68, m 110, soluble in water **t alcoholate** $TlOC_2H_5$ = 249 4 A saturated alcoholic solution of thallous oxide, d 3 55, the heaviest liquid known excepting mercury **t alloys** A mixture of thallium and other metals The m of some thallium alloys are

with	90 %Tl 10 %	80 %Tl 20 %	70 %Tl 30 %	60 %Tl 40 %	50 %Tl 50 %
Cd	235°C	210°C	230°C	245°C	258°C
K	305°C	208°C	240°C	220°C	215°C

t alkyls A group of organic compounds of the type, R_2TlX, as

thallium diethylchloride	Et_2TlCl,
thallium diethylhydroxide	Et_2TlOH,
thallium diethyliodide	Et_2TlI

t alum $Tl_2SO_4,Al_2(SO_4)_3,24H_2O$ = 1279 64 Soluble white crystals **t amalgam** An alloy of 8 5 % Tl and 91 5 % Hg, used in thermometers for low temperatures (−60°C) **t bromides** (1) TlBr = 284 3 Thallous bromide Colorless regular crystals d 7 54, m 450, insoluble in water (2) $TlBr_3$ = 444 1 Thallic bromide Yellow needles, soluble in water or alcohol, decomp by heat **t carbonate** Tl_2CO_3 = 468 8 Thallous carbonate Colorless monoclinic crystals, d 7 11, m 272 (decomp), soluble in water, insoluble in ether **t chlorides** (1) TlCl = 239 5 Thallous chloride Colorless cubic crystals, d 7 02, m 429, b 720, slightly soluble in water or hydrochloric acid, it is used as a getter (q v) in tungsten lamps, and is more stable than $TlCl_3$ (2) $TlCl_3$,-H_2O = 328 5 Thallic chloride Thallium sesquichloride A colorless, deliquescent, crystalline powder, occurring anhydrous or with 1, 4 and 7½ mol of H_2O Very soluble in water or alcohol, decomp 100 **t chloroplatinate** Tl_2PtCl_6 = 816 54 A yellow, sparingly-soluble solid, analogous to K_2PtCl_6 **t ethyl** $TlEt_3$ = 291 39 An "anti-knock" compound **t fluosilicate** $Tl_2SiF_6\,2H_2O$ = 382 48 Six-sided plates, very soluble in water **t formate** HCO_2Tl = 249 39 Thallous formate Colorless liquid, used for mineralogical solutions **t formate- malonate** A double salt, d 4 9, m 60, miscible with water, used as density liquid in mineralogy Cf *Clerici's solution* **t glass** A variety of flint glass in which lead is replaced by thallium It has a high refractive index **t hydroxides** (1) TlOH = 221 4 (+H_2O) Thallous hydroxide A pale yellow powder, soluble in water, alcohol or ether It contains $1H_2O$ and is a strong base, decomp 100 (2) $Tl(OH)_3$ = 255 4 or, TlO (OH) = 237 4 Thallic hydroxide Tl A dark orange powder, insoluble in water or caustic alkalis, soluble in acids or ammonium salt solutions, decomp 100 **t iodides** (1) TlI = 331 31 Thallous iodide A citron-yellow, crystalline powder, d 7 072, m 432, b 806, insoluble in water, alcohol or ether, soluble in aqua regia (2) TlI_3 = 585 15 Thallic iodide A yellow powder, slowly decomp in air, soluble in alcohol or ether **t ions** The monovalent Tl^{+} (thallous) or trivalent Tl^{+++} (thallic) ion **t mercurous nitrate** A saturated solution, d 5 3, used for the separation of minerals **t nitrates** (1) $TlNO_3$ = 266 2 Thallous nitrate Colorless rhombic crystals, d 5 55, m 205, soluble in water or alcohol, used as a reagent and indicator, and in pyrotechnics for green fires (2) $Tl(NO_3)_3$ + $3H_2O$ = 444 4 Thallic nitrate Colorless deliquescent crystals, decomp 100 **t oxides** (1) Tl_2O = 424 8 Thallous oxide A black powder, m 870, decomp 1865, soluble in water, slightly soluble in alcohol Used in the manufacture of flint, glass and artificial gems (2) Tl_2O_3 = 456 8 Thallic oxide A dark brown, hexagonal, crystalline powder d 9°5 56, m 759, decomp 875, insoluble in water and soluble in acids The oxides TlO or Tl O Tl O and Tl_3O_5 also exist **t oxysulfide** Tl_2SO A light-sensitive substance used in photoelectric cells (thalofide cell) **t ozone paper** A filter-paper that has been impregnated with a solution of thallium hydroxide It is colored brown by ozone **t peroxide** T oxide (2) **t phosphate** Tl_3PO_4 = 708 07 Thallous phosphate Colorless needles, d 6 89, soluble in water or in ammonium salt solutions, insoluble in alcohol or ether **t sesquichloride** Thallic chloride **t sulfates** (1) Tl_2SO_4 = 504 8 Thallous sulfate Colorless rhombic prisms, d 6 76, m 632, decomp by further heat, soluble in water, used as a reagent (2) $Tl_2(SO_4)_3,7H_2O$ = 823 1 Thallic sulfate Colorless crystals, decomp by heat, soluble in water It forms double-salts of the type, $MTl(SO_4)_2$, not isomorphous with $TlAl(SO_4)_2$ Used as poison for rodents, and insecticide **t sulfides** (1) Tl_2S = 440 8 Thallous sulfide Black tetragonal, lustrous crystals, d 8 0, m 448 (decomp), insoluble in water, alcohol or ether, soluble in acids (2) Tl_2S_3 = 505 0 Thallic sulfide A black mass, insoluble in water, decomp by heat **t trioxide** T oxide (2)

thallochlor The green coloring material of Iceland moss It differs from chlorophyll

thallofide cell Thalofide cell

thallophytes A class of cryptogamous plants that includes algae, fungi and single-celled plants (bacteria diatoms) Classification

1	*Perdineae*	flagellates
2	*Cyanophyceae*	blue-green algae
3	*Chlorophyceae*	green algae
4	*Rhodophyceae*	red algae
5	*Phaeophycetes*	brown algae
6	*Diatomae*	diatoms
7	*Schizomycetes*	bacteria
8	*Phycomycetes*	algal fungi
9	*Myxomycetes*	slime molds
10	*Eumycetes*	fungi
11	*Characeae*	stone worts

thallous Describing a compound of monovalent thallium **t compounds** See *thallium* **t formate** See *thallium formate*

thalofide cell A photoelectric cell in which thallium oxysulfide is the light-sensitive material, the ohmic resistance decreases when it is illuminated

thalviol Thujone

thanatol $C_8H_{10}O_2$ = 138 08 Guaethol, ajacol pyrocatechin monoethylether, $C_6H_4(OEt)OH$, ethoxyhydroxybenzene An oily liquid, m 27, b 215, insoluble in water, soluble in alcohol or ether, used medicinally

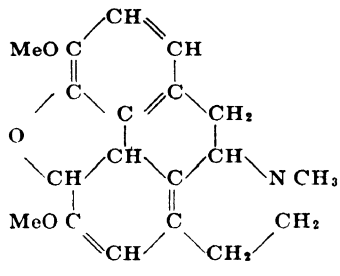
thapsic acid A fatty acid, m 124 from *Thapsia garganica*, an Umbelliferae, insoluble in water, soluble in alcohol

thawing (1) The liquefaction of ice by heat (2) The warming of frozen dynamite until it becomes soft and plastic

thea The Latin term for tea

theamin $C_7H_8N_4O_4$ NH C_2H_4OH Theophylline ethanolamine A white powder, used as a diuretic and vasodilator

thebaine $C_{19}H_{21}O_3N$ = 311 3 Paramorphine, dimethylmorphine An alkaloid from opium



Colorless glistening prisms, m 193, slightly soluble in water, soluble in alcohol or ether It is very poisonous, used medicinally similarly to strychnine **methyl-** $C_{20}H_{23}O_3N$ = 325 3 An alkaloid from opium Colorless crystals, insoluble in water

t hydrochloride (Tbn)HCl H_2O = 365 7 Colorless rhombic crystals, soluble in water, used in ampoule medication **t tartrate** (Tbn)$C_4H_6O_6$ H_2O = 479 36 A white crystalline powder soluble in water or alcohol

thebaol $C_{16}H_{13}O_3$ = 253 1. *3 6*-Dimethoxy-*4*-hydroxyphenanthrene A phenol from thebaine

theelin Oestrone

theelol Oestriol

theetsee A black varnish obtained by tapping the stems or trunks of *Melanorrhoea usitata*, an Anacardiaceae of Malaya

theine Caffeine

thelophoric acid $C_{20}H_{12}O_9$ = 396 1 A deep-red pigment from the fungus *Thelophora*, or from *Hydnum ferrugineum*

ThEm The symbol for thoron

Thénard, Louis Jacques 1777–1857 A French chemist, noted for his writings and the isolation of elementary boron **T's blue** The blue mass obtained by heating alum moistened with cobalt nitrate It consists of cobalt aluminate, $Co(AlO_2)_2$, and its formation is used as a blowpipe test for aluminum

thenardite Na_2SO_4 A native sodium sulfate

thenyl alcohol Thiophene carbinol

theobroma (1) Cocoa (2) A genus of plants, Sterculiaceae, that yield cacao **oil of-** Cacao-butter

theobromine $C_7H_8O_2N_4$ = 180 1 Cacaine, 3 7-dimethylxanthine, 3 7-dimethyl-2 6-dioxypurine An alkaloid from the leaves and seeds of *Theobroma* species an isomer of theophylline and paraxanthine A microcrystalline powder, m 337, slightly soluble in water or alcohol, soluble in ether Used as its salts medicinally, as a diuretic and nerve stimulant **iodo-** T sodium iodide **methyl-** Caffeine **uro-** Paraxanthine

t acetylsalicylate (Tbr)$C_9H_8O_4$ = 360 16 A white crystalline powder, insoluble in water, soluble in alcohol **t barium sodium salicylate** Barutine A white amorphous powder **t hydrochloride** (Tbr)HCl = 215 6 White crystals, soluble in water, used medicinally as a nerve stimulant **t lithium** $C_7H_7LiO_2N_4$ = 186 10 Theobromose Uropherin Colorless needles, soluble in water **t lithium benzoate** $C_7H_7LiO_2N_4$ $LiC_7H_5O_2$ = 314 14 Uropherin-B A white powder, soluble in water, used medicinally **t lithium salicylate** $C_7H_7LiO_2N_4$ $LiC_7H_5O_3$ = 330 14 Uropherin-S A colorless powder, soluble in water **t salicylate** (Tbr)$C_7H_6O_3$ = 318 15 Fine white needles, slightly soluble in water, used medicinally **t sodium acetate** $C_7H_7NaO_2N_4$ $NaC_2H_3O_2$ = 284 12 Theonacet, aguirin A hygroscopic white powder, used medicinally **t sodium benzoate** $C_7H_7NaO_2N_4$ $NaC_7H_5O_2$ = 346 14 A white crystalline powder, soluble in water **t sodium citrate** $C_7H_7NaO_2N_4$-$Na_3C_6H_5O_7$ = 460 40 Urocitral A white powder, soluble in water **t sodium formate** $C_7H_7NaO_2N_4$ $NaCHO_2$ H_2O = 288 12 Theophorine A white powder, soluble in water **t sodium iodide** $C_7H_7NaO_2N_4$ NaI = 352 02 Eustenin, iodotheobromine, sodium iodotheobromate A white hygroscopic powder, soluble in water

theobromose Theobrominelithium

theocine A brand of synthetic theophylline

theodolite An instrument for measuring angles in horizontal and vertical planes, used in surveying

theoforine Theobromine sodium formate

theoline C_7H_{16} = 100 1 An aromatic hydrocarbon from petroleum

theonacete Theobromine sodium acetate

theophorine Theobromine sodium formate

theophylline $C_7H_8O_2N_4$ H_2O = 198 2 1 3-Dimethylxanthine, 1 3-dimethyl-2 6-dioxypurine An isomer of theobromine, an alkaloid from tea leaves Colorless needles, m 264, slightly soluble in water, alcohol, or ether, used medicinally as a cardiac stimulant **t ethylene diamine** Euphylline A white crystalline powder, soluble in water **t sodium** C_7H_7-

NaO_2N_4 = 202 3 Colorless crystals, soluble in water **t sodium formate** $C_7H_7NaO_2N_4$-$NaCHO_2H_2O$ = 288 4 Theophorine An isomer of theoforine A white powder, soluble in water

theorem Theory

theory The reduction of data or facts to a principle, and the demonstration of their interrelations A doctrine or proposition capable of being demonstrated **atomic-** See *atom* **ionic-** See *ions, ionization* **phlogiston-** See *phlogiston* **quantum-** See *quanta, energy levels, orbits* **side-chain-** See *Ehrlich theory* **valency-** See *valency*

theotannin A tannin prepared from freshly-plucked, green tea leaves

thephorine Theophylline sodium formate Cf *theoforine*

therapeutic Pertaining to the art of healing **t agent** A remedy or substance used to alleviate disease, pain or injuries Therapeutic agents are classified according to their physiological actions

I *Internal remedies*
A Affecting nutrition —hematics, alkalis, acids, digestants, antipyretics, alteratives
B Affecting the nervous and muscular system
(a) The brain —cerebral excitants, cerebral depressants, narcotics, hypnotics, analgesics, anesthetics
(b) The spinal cord —motor excitants, motor depressants
(c) Nerve centers and ganglionic systems —antispasmodics, tonics, antiperiodics
(d) Heart and circulatory system —cardiac stimulants, cardiac sedatives, vascular stimulants, vascular sedatives
(e) Excretories —diuretics, renal depressants, vesical tonics, vesical sedatives, urinary sedatives, diaphoretics, sudorifics, anhidrotics, antilithics
C Affecting special organs
(a) Organs of respiration —expectorants, pulmonary sedatives, errhines, sternutatories
(b) Alimentary canal —sialagogues, emetics, purgatives, peristaltics, carminatives, astringents, stomachics
(c) The liver —hepatic stimulants, cholagogues, hepatic depressants
(d) Generative system —ecbolics, emmenagogues, aphrodisiacs, anaphrodisiacs
(e) Eyes (ciliary muscle) —mydriatics, myotics
II *External remedies*
A Irritants
rubefacients, epispastics, pustulants, escharotics
B Local sedatives
demulcents, emollients
III *Agents which act on organisms infecting the human body*
Antiseptics, disinfectants, antizymotics, anthelmintics, antiparasitics, antiperiodics

t index The ratio minimum fatal dose/minimum curative dose *chemical-* The ratio curative dose/tolerated dose

therapeutics. The teaching of the use of remedial measures, the science and art of curing disease

therapy A system of treatment, as

pharmacotherapy	action of drugs
specific chemotherapy	action of chemicals
immunotherapy	action of vaccines
organotherapy	action of glands

Cf *aero t , atmo t , hydro t , electro t , radium t*

therm (1) *Metric* Small calorie (2) *British* British Thermal Unit (B Th U), q v It equals 251 9 calories, and is the heat-producing capacity of 200 cubic feet of standard supply gas

thermae Natural warm springs

thermal Pertaining to heat or temperature **t capacity** The amount of heat necessary to change the unit mass of a body one degree centigrade, =M × spec heat, where M is the mass **t conductivity** The amount of heat that passes, in unit time, through a unit volume (one cubic centimeter) of a substance when the opposite faces of the cube differ by one degree centigrade **t constant** The heat in calories evolved during a particular reaction **t death point** The degree of temperature required to kill bacterial cultures when exposed for 10 minutes **t deformation** Pyro-electricity **t energy** Heat energy **t excitation** The transition of an electron to an excited orbit, caused by an increase in temperature According to Saha, the fraction, Y, of a gas which is excited at the absolute temperature, T, is $\log \frac{Y}{1-Y} = -\frac{5048E}{T}$, where E is the excitation potential **t expansion** The increase of volume due to heat It is relatively small for solids and liquids, but large for gases **t intensity** Temperature **t ionization** The loss of an electron by an atom due to an increase in temperature The fraction, X, of an element which is ionized at absolute temperature, T, is (Saha)

$$\log \frac{X}{1-X} = -\frac{5048I}{T} + \frac{5}{2}\log T - \log p_e - 6\,5,$$

where I is the ionization potential and p_e the electron pressure in atmospheres **t radiations** Heat radiations, q v **t unit** Therm

thermel Thermocouple

thermic Pertaining to heat

thermifugin $C_9H_8(CH_3N\,COONa)_3$ = 404 1 Sodium methyltrihydroxyquinoline carbonate A pale yellow powder, soluble in water, used medicinally as an antipyretic

thermin $C_{10}H_{11}NH_2\,HCl$ = 183 6 Tetrahydro-β-naphthylamine hydrochloride Pale-rose, crystalline powder, m 237, soluble in water, alcohol or ether, used medicinally as a mydriatic

thermion The ions which carry current through a vacuum in a thermionic tube They may be positive (positively-charged atoms), or negative (electrons)

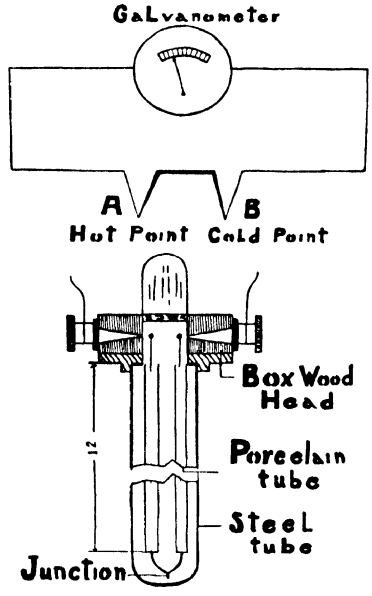
thermionic effect The loss of electrons from a heated body maintained at an electric potential It is the foundation of the thermionic valve or tube used for radio reception or transmission, and may be used to rectify or to amplify currents

thermit(e) A mixture of aluminum and ferric oxide (Fe_3O_4) It is ignited by a primer (magnesium powder) and reacts violently

with liberation of heat and formation of aluminum oxide and molten iron Used in the thermite process and incendiary bombs, and attains a temperature of about 3000°C **t process** Goldschmidt's process Thermo-reduction (1) A method of obtaining a high temperature and molten iron by igniting a mixture of aluminum and ferric oxide, used in welding steel, rails, steam-ship shafts, etc (2) A method of obtaining metallic chromium or manganese by mixing their oxides with powdered aluminum and igniting the mixture with a primer, the aluminum combining with the oxygen of the oxide to form Al_2O_3

hermo- A prefix derived from the Greek, indicating "heat"

hermochemistry The study of the relations of heat and chemical reactions (See *thermodynamics*)



Thermocouple

hermocouple Thermopile, thermel, thermoelement, thermojunction A sensitive device for measuring temperature by the production of a thermo-electric current at the junction of two different metallic wires embedded in clay or porcelain One wire is kept at constant low temperature, the other at the temperature to be measured

Couple	Maximum temperature	E M F
copper-constantan	500°C	25 54 millivolts
chromel-copel	550	
silver-constantan	600	32 50
iron-constantan	600	32 75
chromel-alumel	1200	
Pt—(*90%* Pt+*10%* Rh)	1600	18 00
Ni—nickel chrome	1090	41 80

By using a sensitive galvanometer and a t of Bi and Sb wires the heat radiations from stars or planets are measured Cf *radiometer, pyrometer, bolometer*

hermocross Thermocouple

thermodin $C_{13}H_{17}O_4N$ = 251 2 Phenacetin urethane, acetyl-p-ethoxyphenylurethane, EtO - C_6H_4 N(COMe)COOEt Colorless crystals, m - 87, slightly soluble in water, used medicinally as an antipyretic

thermodynamic concentration Activity **t potential** Gibb's function, thermo-potential "*The differential coefficient of the energy with respect to the variable expressing the quantity of the substance*" (Gibbs)

thermodynamics The study, founded on experiment, of the empirical relations between heat energy and other forms of energy **First law of-** *Conservation of energy,* "Heat and work are equivalent" Thus, a definite quantity of heat gives a fixed amount of mechanical energy, and, *vice versa,* a definite quantity of mechanical energy yields a fixed quantity of heat This is also expressed by the statement that any change or transformation produced in a body is proportional to the *heat equivalent,* hence, the change in the energy content of a body depends on the difference between the original and final states, and is independent of any intermediate states The maximum net amount of work obtained from a given process, changing at constant temperature and pressure from a higher to a lower state, is the *free energy* **Second law of-** *Degradation of energy* It is impossible, when unaided by any external agency, to convey heat from one body to another at a higher temperature, therefore in all changes, the *entropy* or amount of irreversible energy of the participating bodies increases **Third law of-** Every substance has a finite positive entropy and, at absolute zero temperature, the entropy value is zero in the case of pure crystalline substances Cf *entropy*

thermoelectric Pertaining to electricity produced by heat **t current** An electric current produced from a thermo-couple **t power** The thermoelectromotive force produced at the junction of two metals by a temperature-difference between the two metals of one degree centigrade

thermoelectromotive force Thermoelectric power

thermoelement (1) Thermocouple (2) Thermopile

thermograph A self-recording thermometer

thermojunction Thermocouple

thermokalite A mixture of trona, thenardite, thermonatrite and sodium bicarbonate

thermolabile Decomposed or destroyed by heat

thermoluminescence Luminescence caused by a slight increase in the temperature of a body, without the production of incandescence

thermolysis Dissociation or decomposition produced by heat

thermomagnetic effect A difference in magnetic properties caused by heat, as, the Leduc effect, Nernst effect

thermometamorphism A change in allotropic forms produced by heat

thermometer A device for determining the temperature or the intensity of heat of a body Three types *Mechanical-* Consists of a substance that expands and contracts with alterations of temperature

Electrical- Involves measuring the change in or production of an electric current or resistance caused by a change of temperature, as, resistance thermometers, electrical thermocouples

Optical- Involves examining the light of an

incandescent body, as, optical pyrometer, radiation thermometer

THERMOMETERS

Classification according to Rimbach and Behar

A	Indicating Thermometers (visible scales)		
1	Liquid-in-glass (visible column)		
	mercury	− 38 to 540°C	
	pentane	−180 to 20°C	
	alcohol	− 70 to 120°C	
	thallium amalgam	− 60° to 100°C	
	gallium in quartz	31 to 1000°C	
2	Pressure-spring (dials)		
	mercury expansion	− 38 to 530°C	
	non-mercury liquids	− 50 to 400°C	
	vapor pressure	− 30 to 370°C	
	gas filled	−130 to 540°C	
3	Solid expansion		
	bimetallic	up to 550°C	
	metal and refractory	up to 650°C	
4	Electrical resistance		
	nickel	−180 to 120°C	
	platinum	−180 to 1000°C	
B	Indicating Pyrometers (graphic pointers)		
1	Thermoelectrical		
	thermocouples	up to 1600°C	
2	Optical		
	optical pyrometer	600 to 2500°C	
3	Radiation		
	radiation pyrometers	500 to 2000°C	
4	Fusion and melting		
	Seger cones	600 to 2000°C	

C Controlling thermometers (thermostats, q v)

angle- An L-shaped t for insertion in the vertical side of a vessel **armored-** A t surrounded by a metal casing **Beckmann-** See Beckmann **kata-** q v **ultra-** Beckmann t

t conversion To change a thermometer reading from one scale to another

To change °C to °F—Multiply the °C by nine, divide by five, and add 32

To change °F to °C—Subtract 32 from the °F, multiply by five and divide by nine

t scales

(1) °C = degree centigrade or degree Celsius

$$t°C = \frac{9}{5}t + 32°F = \frac{4}{5}t°R = t + 273°A$$

(2) °F = degree Fahrenheit

$$t°F = \frac{5}{9}(t - 32)°C = \frac{4}{9}(t - 32)°R$$

(3) °R = degree Réaumur

$$t°R = \frac{5}{4}t°C = \frac{9}{4}t + 32°F = \frac{5}{4}t + 273°A$$

(4) °A = degree absolute

$$t°A = t - 273°C$$

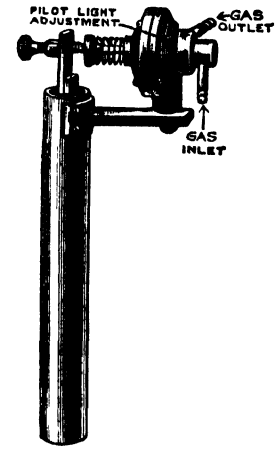
thermonatrite $Na_2CO_3 H_2O$ A native monohydrated sodium carbonate

thermoneutrality The absence of a heat change when dilute solutions of neutral salts are mixed, and no precipitate forms

thermonuclear reaction A reaction which proceeds at high temperatures (*e g*, in the interior of a star) and results in transmutation of elements by bombardment by α-particles, protons, electrons, etc

thermophore A device for retaining or holding heat, as, a hot water bag

thermopile A thermoelement which consists of a series of soldered metal plates or bars arranged in series so as to produce a cumulative effect, when heated at their junctions an electric current results



Thermoregulator for gas-heated thermostats

thermoplastic Rendered soft and moldable by the action of heat Cf *plastics*

thermopotential Thermodynamic potential

thermoreduction Thermite process

thermoregulator A device for mechanically regulating temperature by controlling the source of heat (See *thermostats* and illustration)

thermosetting Rendered hard by heat, as, certain plastics q v

thermostabile, thermostable (1) Refractory or heat-resisting (2) In biochemistry, not affected by temperatures above 55°C, or below 100°C

thermostat A device for regulating the heat of an oven, incubator, retort or other apparatus automatically

thermotaxy (1) A form of orthotaxy (q v) produced by the influence of heat (2) The directional tendency of regular groupings in crystalline substances due to heat

thermotension The subjection of a red-hot metal to high tensile stress during cooling

thermotropic Caloritropic Stimulated by or responding to a change of temperature

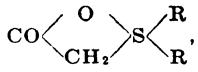
thermsilid An acid-resisting alloy of 84 % iron and 16 % silicon

°C	°F	°R	°A	°C	°F	°R	°A	°C	°F	°R	°A	°C	°F	°R	°A
1000	1832	800	1273	45	113	36	318	95	203	76	368	−5	23	−4	268
900	1652	740	1173	40	104	32	313	90	194	72	363	−10	14	−8	263
800	1472	640	1073	35	95	28	308	85	185	68	358	−15	5	−12	258
700	1292	560	973	30	86	24	303	80	176	64	353	−17 8	0	−14 2	255 2
600	1112	480	873	25	77	20	298	75	167	60	348	−20	−4	−16	253
500	932	400	773	20	68	16	293					−30	−22	−24	243
400	752	320	673	15	59	12	288	70	158	56	343	−40	−40	−32	233
300	572	240	573	10	50	8	283	65	149	52	338	−50	−58	−40	223
200	392	160	473	5	41	4	278	60	140	48	333	−100	−148	−80	173
150	302	120	423	0	32	0	273	55	131	44	328	−200	−328	−160	73
100	212	80	373	−1	30 2	−0 8	272	50	122	40	323	−273	−459 4	−218 4	0

Besides these common scales there are (5) °K = degree Kelvin, practically the same as °A (6) °Ra = degree Rankine which is absolute Fahrenheit or °F based on absolute zero −459°F = 0°Ra 0°F = 459°Ra, 212°F = 671°Ra

theta The Greek letter θ, Θ See *T*

thetine Thiobetaine, sulfinate A group of organic compounds derived from the heterocyclic compound,



e g, dimethylthetine, where R is —CH_3 **dimethyl-** $OSMe_2CH_2CO$ = 120 12 *2 2*-dihydro-*2 2*-dimethyl-*1 2*-oxathietan-*4*-one Deliquescent crystals, decomp by heat

theveresin $C_{48}H_{70}O_{17}$ = 918 7 A white amorphous powder a split-product of thevetin

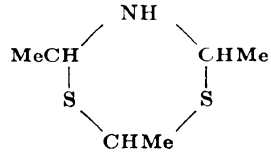
thevetin $C_{54}H_{48}O_{24}$ = 1100 5 A crystalline glucoside from the seeds of yellow oleander, *Thevetia nerufolia*, an Apocynaceae of Central America Small colorless crystals, m 215, $[\alpha]_D$ −39 2°, slightly soluble in water, soluble in alcohol Cf *theveresin*

thiacetamide Thioacetamide

thiacetic Thioacetic acid

-thial* The suffix for a thioaldehyde, as, ethanethial*, CH_3CHS

thialdine $C_6H_{13}NS_2$ = 163 26

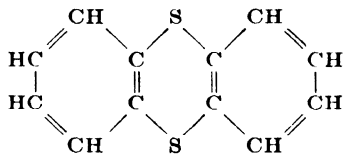


Colorless crystals, d 1 92, m 43 (decomp), soluble in water, alcohol or ether, used medicinally as a heart stimulant

thiamide An organic compound of the type, R—C S (NH_2) **iso-** An organic compound of the type, R—C NH (SH)

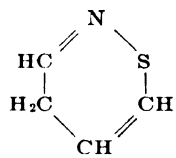
thiamin Vitamin B_1

thianthrene $C_{12}H_8S_2$ = 216 24 Diphenylene disulfide, dibenzo-*p*-dithin The heterocyclic compound,

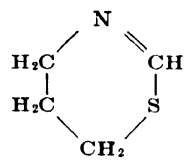


m 159, b 365, insoluble in water, soluble in alcohol or ether

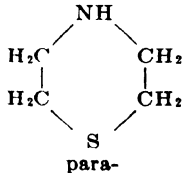
thiazine A group of sulfur-containing heterocyclic compounds



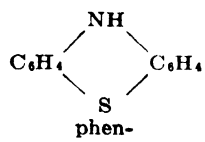
ortho-



meta-

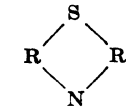


para-



phen-

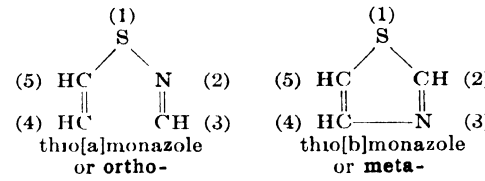
Cf *benzo-t*, *benziso-t*, *pheno-t* **t dyes** A group of aniline dyes derived from thiazines and containing the grouping,



as in thionine, toluidine blue, methylene blue, methylene violet

thiazole C_3H_3NS = 85 1 Metathiazole, thio[o]-monazole A colorless liquid, d 1 200, b 117, insoluble in alcohol, soluble in ether **t purple** $C_{19}H_{17}BrN_2S_2$ A carbocyanine dye *1 1'*-dimethyl thiocarbocyanine bromide, used as photographic sensitizer

thiazoles A group of organic compounds derived from



thio[a]monazole or **ortho-**

thio[b]monazole or **meta-**

The derivatives are named according to position, thus

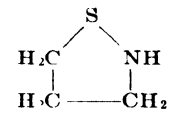
1—s—(sulfur)	1—s—(sulfur-)
2—n—(nitrogen)	2—μ— (median-)
3—γ—(gamma)	3—n—(nitrogen-)
4—β—(beta)	4—β—(beta-)
5—α—(alpha)	5—α—(alpha-)

as in

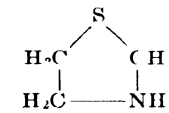
μ-amidothiazole, C_3H_2NS NH	m 90
α-methylthiazole, C_3H_2NS Me	b 232
μ-methylthiazole	b 128
$\alpha\mu$-dimethylthiazole, C_3HNSMe_2	b 143
trimethylthiazole, C_3NSMe_3	m 167

dihydro- Thiazoline **tetrahydro-** Thiazolidine

thiazolidine C_3H_7NS = 89 1 Tetrahydrothiazoles The saturated heterocyclic compounds



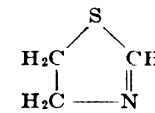
ortho-



meta-

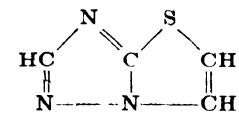
4-keto-2-thio-m- Rhodamine

thiazoline C_3H_5NS = 87 1 Dihydrothiazoles A group of organic compounds derived from the heterocyclic compound,



μ-methylthiazoline, C_3H_4NSMe	b 145
μ-phenylthiazoline, C_3H_4NSPh	b 276

thiazoltriazol $C_4H_3N_3S$ = 125 1 The heterocyclic compound,

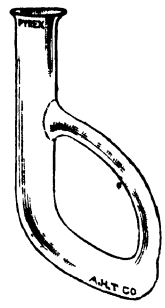


thiazyl (1) The monovalent radical, C_3H_2NS—, derived from thiazole (2) The monovalent N_3S_4— radical **t chloride** N_3S_4Cl = 205 77 **t nitrate** $N_3S_4NO_3$ = 232 32

thicken (1) To evaporate to a greater viscosity (2) To expand the ends of a metal rod

thickness (1) The degree of viscosity or fluidity (2) The width of a plate (3) The radius or gage of a wire

Thiele tube A specially-shaped test-tube (see illustration) which if heated at the base insures the circulation of the liquid in it, and thus, an even distribution of heat Used in making melting-point determinations, a melting-point tube and thermometer being inserted in it

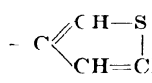


Thiele tube

Thiel-Stoll solution A saturated solution of lead perchlorate, $Pb(ClO_4)_2$, d 2 6, used for determining the specific gravity of minerals by the suspension method

thienone Thienylketone **aceto-** Thienylmethylketone

thienyl The monovalent radical, —C_4H_3S, derived from thiophen



t diphenylmethane $C_{17}H_{14}S$ = 250 1 $(C_4H_3S)CHPh$ Colorless crystals, m 63, b 335, soluble in alcohol **t ketone** $C_9H_6OS_2$ = 194 17 Thienone *2 2'*-dithienylketone, $(C_4H_3S)_2CO$ White needles m 87, b 326 insoluble in water **t methylketone** C_6H_6OS = 126 1 Acetothienone $(C_4H_3S)COMe$ A colorless liquid, b 213 **t phenylketone** $C_{11}H_8OS$ = 188 1 $(C_4H_3S)COPh$ Colorless crystals, m 55, b 360, soluble in alcohol

Thies process A method of extracting gold from ores by adding chloride of lime and sulfuric acid to the crushed ore

thigenol A dark brown solution of sodium sulfo-oleate used medicinally as an antiseptic

thimble A porous cup made of filter paper or alundum used for extracting materials *e g*, in a Soxhlet apparatus

thinner A liquid which is used to thin out or dilute a solution of a paint or lacquer but which is not itself necessarily a solvent for it (cf *vehicle*)

thinolite A tufa or native calcium carbonate, forming layers of interlaced crystals It occurs in Nevada and California in large deposits

thio- A prefix derived from the Greek "theion" —sulfur It indicates the replacement of oxygen in an acid radical by sulfur having a negative valence of two Cf *sulfo-*

thioacetal Mercaptal

thioacetaldehyde $(CH_3CHS)_3$ = 180 31 A solid, m 45, b 205, soluble in alcohol, insoluble in water or ether

thioacetamide C_2H_5NS = 75 1 Thiacetamide $MeCSNH_2$ Colorless leaflets, soluble in water or alcohol, m 109 Its derivatives are thiamides

thioacetanilide C_8H_9NS = 151 2 The thiamide, $MeCSNHPh$ Colorless needles, m 75, decomp by further heat, insoluble in water, soluble in alcohol or alkalis, used in organic synthesis

thioacetic acid C_2H_4OS = 76 1 Thiacetic acid, thiolacetic acid The thiolic acid, $MeCOSH$ A colorless liquid, d 1 074, b 93, soluble in water, alcohol or ether

thioacetin $C_8H_{10}O_3S$ = 150 15 Akcethin

thioacid An organic compound in which divalent sulfur has replaced some or all of the oxygen atoms of the carboxyl group, as,

$RCOSH$	thiolic acids* or carbothiolic acid*
$RCSOH$	thionic acids* or carbothionic acid*
$RCSSH$	dithionic acids* or carbodithioic acid*

If structure is uncertain

$RCSOH \rightleftharpoons RCOSH$	thioic acid* or carbothioic acid*, *e g*,
CH_3COSH or CH_3CSOH	ethanethioic acid* or methane carbothioic acid*

If structure is certain

CH_3COSH	ethanethiolic acid* or methane carbothiolic acid*
CH_3CSOH	ethanethionic acid* or methane carbothionic acid*
CH_3CSSH	ethanethionothiolic acid* or methane carbodithioic acid*

They differ from sulfo-acids in which sulfur is tetra- and hexavalent See *polythionic acids*, *carbylic acid*

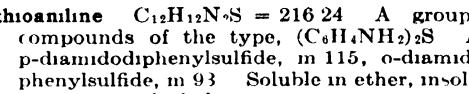
thioalcohol Hydrosulfide

thioaldehyde A group of organic compounds containing the monovalent -CHS radical They have the suffix -thial*, q v

thioamides A group of organic compounds of the type $RCSNH_2$

thioanhydride An anhydride of a thioacid

Three types



thiolic anhydride *thionic* anhydride *dithionic* anhydride

thioaniline $C_{12}H_{12}N_2S$ = 216 24 A group of compounds of the type, $(C_6H_4NH_2)_2S$ *E g*, p-diamidodiphenylsulfide, m 115, o-diamidodiphenylsulfide, m 93 Soluble in ether, insoluble in water or alcohol

thioantimonate A salt of the unknown orthothioantimonic acid, H_3SbS_4 or $Sb_2S_5,3H_2S$ See *Schlippe's salt*

thioantimonites Salts of the type R_3SbS_3, $R_4Sb_2S_5$ and RSb_2, known only in solution

thioarsenate A salt of the type, M_3AsS_4

thioarsenite A salt of the type, M_3AsS_3

thiobacteria A group of bacteria that reduce or oxidize sulfur compounds

thiobenzaldehyde PhCHS = 122 14 **alpha-** A solid, m 160, decomp by further heat Soluble in alcohol or benzene, insoluble in water **beta-** A solid, m 225, soluble in acetic acid

thiobenzamide C_7H_7NS = 137 1 The thiamide, $PhCSNH_2$ Colorless crystals, m 116

thiobenzanilide $C_{13}H_{11}NS$ = 213 2 The thiamide, $PhCSNHPh$ Colorless crystals, m 98

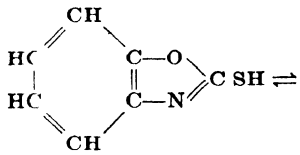
thiobenzimidazolone Phenylene thiourea

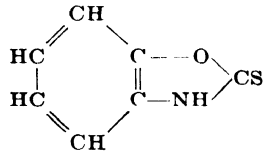
thiobenzoic acid C_7H_6OS $\frac{1}{2}H_2O$ = 147 15 The thiolic acid, $PhCOSH$ Colorless crystals,

m 24 insoluble in water, soluble in alcohol or ether Cf *sulfobenzoic acid*

thiobenzophenone $C_{13}H_{10}S$ = 198 14 Ph CS - Ph Colorless crystals, m 146 5

thiobenzoxazole C_7H_5ONS = 151 1 The heterocyclic tautomeric compound

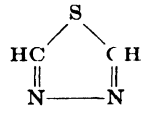




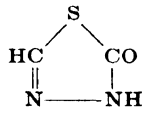
Colorless crystals, m 193

thiobetaine Thetine

thiobiazoline $C_2H_2N_2S$ = 86 1 Thio-bb'-diazole The heterocyclic compound,



thiobiazolone $C_2H_2ON_2S$ = 102 1 The heterocyclic compound,



thiocacodylate A salt of thiocacodylic acid containing the Me_2AsOS— radical

thiocarbamic acid CH_3NS_2 = 93 16 $CS(NH_2)$-SH, soluble in water, alcohol or ether **t ester** An organic compound of the type, R_2N CS OR, *e g*, diphenylthiocarbamic phenyl ester, Ph_2N - CS OPh

thiocarbamide Thiourea

thiocarbanilide Sulfocarbanilide

thiocarbimide Isothiocyanic acid

thiocarbin A mercaptan prepared by boiling glycerol with sodium thiosulfate, used as photographic emulsion ripening accelerator, and as an analytical reagent

thiocarbonate (1) A salt of trithiocarbonic acid of the type, M_2CS_3 (2) A salt of one of the thiocarbonic acids

thiocarbonic acids (1) A group of thioacids derived from carbonic acid by substitution of one or more of its oxygen atoms

monothiocarbonic acid (thiouic arbonic acid)	$CS(OH)_2$
carbonylmonothio acid (thiolcarbonic acid)	$CO(SH)OH$
dithiolcarbonic acid (carbonyl-dithio acid)	$CO(SH)_2$
dithiocarbonic acid (See *xanthic* acid)	$CS(SH)OH$
trithiocarbonic acid	$CS(SH)_2$

(2) H_2CS_3 = 110 6 An insoluble liquid, cf *sulfocarbonic acid* **ortho-** $C(SH)_4$ Known only in esters **per-** H_2CS_4 = 142 2 A red oily liquid, decomp to CS_2, H_2S and S **t ester** An ester of a thiocarbonic acid, as,

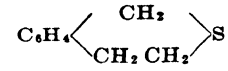
diphenyl-*thio*carbonic ester, PhO CS OPh
diphenyl*thiol*carbonic ester, PhO CO SPh

thiocarbonyl The divalent >CS radical, analogous to >CO

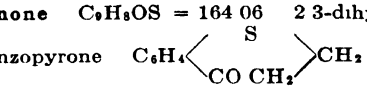
thiocarbonylchloride Thiophosgene

thiocarburyl chloride Thiophosgene

thiochroman $C_9H_{10}S$ = 150 08 Dihydrobenzothiopyran



thiochromanone C_9H_8OS = 164 06 2 3-dihydro-1 4-benzopyrone

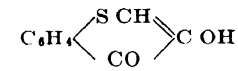


thiochrome A fluorescent quinochrome (q v) which contains sulfur It is an oxidation product of vitamin B_2 (q v), and is used to determine it

thiochromene 1 2-Benzothiopyran

thiochromone 1 4-Benzothiopyrone **2 3-dihydro-** Thiochromanone **3-hydroxy-** Thiochromonol **2-phenyl-** Thioflavone **2-phenyl-4-keto-** Thioflavone

thiochromonol $C_9H_6O_2S$ = 178 1 3-hydroxybenzothiopyrone, hydroxythiochromone

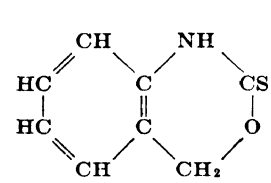


thiocol Registered trademark for a preparation of potassium guaiacol sulfonate Cf *thiokol*

thiocoumarin 1 2-Benzothiopyrone

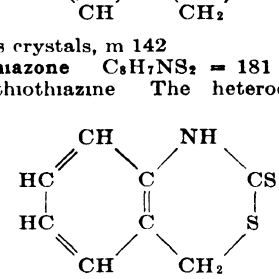
thiocresol MeC_6H_4SH = 124 16 **ortho-** m 15, b 193 A solid **meta-** A liquid **para-** A solid, m 4 3, b 191 It stimulates cell proliferation and granulation of tissue

thiocumazone C_8H_7ONS = 165 14 Benzodihydrothiometoxazine The heterocyclic compound,



Colorless crystals, m 142

thiocumothiazone $C_8H_7NS_2$ = 181 21 Benzodihydrothiothiazine The heterocyclic compound,



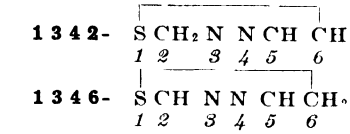
Colorless crystals, m 166

thiocyanate* A salt of thiocyanic acid, which contains the monovalent radical, —SCN Thiocyanate is the term preferred for thiocyanide, sulfocyanate, sulfocyanide, rhodanate, rhodanide

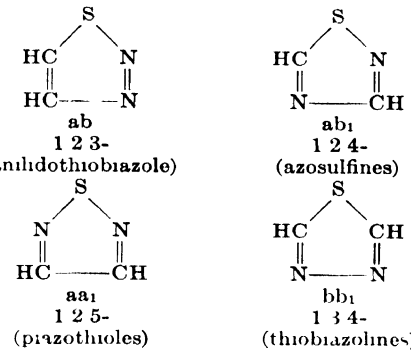
thiocyanic acid HSCN = 59 1 Sulfocyanic acid, rhodanic acid HS C N A colorless liquid, m 5, decomp 200, soluble in water, alcohol or ether **t ester** An ester of thiocyanic acid of the type, R—SCN *E g*, methylthiocyanate, MeSCN, ethylthiocyanate, EtSCN

thiocyanide Thiocyanate

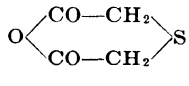
thiocyano The monovalent radical NCS—
t dyestuffs Dyestuffs produced from nuclear-substituted t derivatives or aromatic amines and phenols They are deeper in shade than the corresponding non-substituted compound
thiocyanogen $C_2N_2S_2$ = 116 0 NCS—SCN, white rhombic crystals, m −2, unstable, particularly in light It behaves like a halogen
t value An analogue of the iodine number (q v) in which the thiocyanate radical replaces iodine Cf *thiocyanometry*
thiocyanometry Rhodanometry Volumetric analytical methods using thiocyanates, as, determination of silver, the halogen-absorbing capacity of unsaturated compounds, etc
thiocyanuric acid $C_3N_3S_3H_3$ = 177 25 Yellow needles, decomp 200, soluble in alcohol, water or ether
thiodialkylamine An organic compound of the type, R_2NSNR_2, as, thiodiethylamine, Et NSN Et_2
thiodiazine Diazthines Derivatives of the heterocyclic compounds



thiodiazoles $C_2H_2N_2S$ = 86 2 A group of heterocyclic compounds



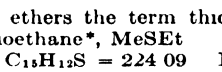
dihydro- Thiodiazoline **tetrahydro-** Thiodiazolidine
thiodiazolidine $C_2H_6N_2S$ = 90 2 Tetrahydrothiodiazole A group of heterocyclic compounds derived by saturating thiodiazoles
thiodiazoline $C_2H_4N_2S$ = 88 2 Dihydrothiodiazole A group of heterocyclic compounds derived by partially saturating thiodiazoles
thiodiglycol Dioxyethylene sulfide S(CHOH - $CH_2OH)_2$
thiodiglycollic anhydride $C_4H_4O_3S$ = 132 10 The heterocyclic compound



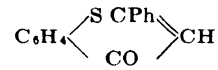
Colorless crystals, m 103, b 159
thiodiphenylamine Phenothiazine
thioether Alkylsulfide, sulfur ether An organic compound of the type, R S R , obtained from alkylhalides and alkalisulfides, and forming colorless volatile liquids that can be oxidized to sulfones *E g* ,

methylsulfide	Me_2S, b 37
ethylsulfide	Et_2S, b 91
n-propylsulfide	Pr_2S, b 130°
n-butylsulfide	Bu_2S, m 182
vinylsulfide	$(CH_2\ CH)_2S$, b 101
allylsulfide (oil of garlic)	$(CH_2\ CH\ CH_2)_2S$, b 140

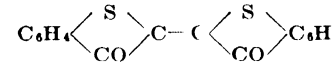
In mixed ethers the term thio* is used, thus, methylthioethane*, MeSEt
thioflavol $C_{15}H_{12}S$ = 224 09 Phenylbenzothiopyran The heterocyclic compound,



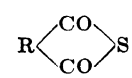
thioflavone $C_{15}H_{10}OS$ = 238 09, 4-keto-2-phenyl-1 4-benzothiopyrone



thioform A basic bismuth dithiosalicylate, used as a dental antiseptic
thioformanilide C_7H_7NS = 137 14 The thioaldehyde Ph NH CSH Colorless crystals, m 137
thiofuran Thiophen
thiogenic dyes Sulfur dyes
thioglycerol $C_3H_8O_2S$ = 108 12 **1-** CH_2SH - CHOH CH_2OH A colorless liquid, d 1 295, decomp by heat **2-** $(CH_2OH)_2CHSH$ *1 2-* **di-** $C_3H_8OS_2$ = 124 19 A thick liquid, d 1 342, decomp 130 **tri-** $C_3H_8S_3$ = 140 26 A heavy odorous liquid, d 1 391 They are all used to treat skin diseases
thioglycollic acid $C_2H_4O_2S$ = 92 04 CHSH - COOH White crystals, used as reagent for iron (1 10 million)
thiohydantoic See *hydantoic*
thiohydroquinone $C_6H_4(SH)_2$ = 142 20 A solid, m 98
thiohydroxy Hydrosulfide, q v Cf *thiol**
thioindigo $C_{16}H_8O_2S_2$ = 296 20



Used as a permanent purple dye
thioindigotic acid Sulfindigotic acid
thioketone A compound of the type R_2CS Their suffix is -thione*, as, *2*-butanethione*, MeCSEt or CH_3 CS CH_2 CH_3
thiokol Polyethylene tetrasulfide A synthetic rubber, d 1 60, obtained from sodium polysulfide and ethylene dichloride Cf *thiocol*
thiol* The monovalent radical, —SH Cf *hydrosulfide, thiols*
thiolacetic acid (1) Thioacetic acid (2) Thioglycollic acid (incorrect use)
thiolic acid An organic compound containing the monovalent radical, -CO SH **t anhydride** A compound of the type



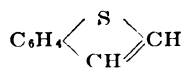
thiols Mercaptans, hydrosulfides A compound of the type R SH methanethiol*, CH_3SH, ethanedithiol*, CH_2SH CH_2SH, propanetrithiol*, $(CH_2SH)_2CHSH$
thion Pertaining to divalent sulfur Cf *thione*
t dyes Sulfur dyes **t kudor** A red-yellow solution of sulfur in boiling milk of

lime It contains the calcium polysulfides, CaS_2 to CaS_7

thionalid Thio-glycollic-β-amino-naphthalide, used as a reagent

thionamic acids An organic compound of the type, R NH S O OH, in which sulfur replaces the carbon of the COOH group *E g* ethyl-thionamic acid, EtNH SOOH, diethylthio-namic acid, Et_2N SOOH Cf *carbamic acid*

thionaphthene C_8H_6S = 134 1 Benzothio-phene, benzothiofuran The heterocyclic com-pound,



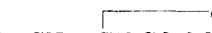
Colorless leaflets, m 31, b 221, soluble in alcohol

thionate Thiosulfate **di-** A salt of the type $M_2S_2O_6$ **penta-** A salt of the type $M_2S_2O_6$ **tetra-** $M_2S_4O_6$ **tri-** $M_2S_3O_6$

thion dyes Sulfur dyes

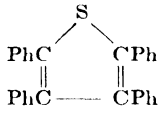
-thione* The suffix for a thioketone, as, propanethione*, CH_3 CS CH_3 Cf *thion*

thioneine $C_9H_{16}N_3O_2S$ = 230 12 Thionene thiazine, ergothioneine, sympectothiene,



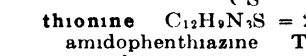
A constituent of blood and certain plants Cf *histidine*

thionessal $C_{28}H_{26}S$ = 388 2 The heterocyclic compound,



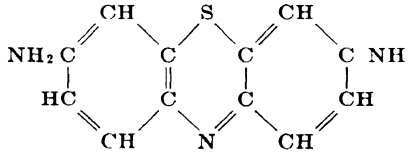
Colorless crystals m 184

thionic acid (1) An organic compound contain-ing the monovalent —CS OH radical (See *thioacids, polythionic acids*) (2) A compound of the type, $H_2S_nO_6$, where n varies from 2 to 5 See *sulfuric acids* **t anhydride** A compound



of the type R

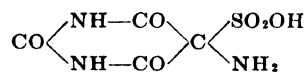
thionine $C_{12}H_9N_3S$ = 227 2 Lauth's violet, amidophenthiazine The heterocyclic com-pound,



A greenish-black powder of metallic luster, soluble in water with violet color Used as a nuclear stain in microscopy, and as a hydrogen-ion indicator Cf *thioneine, leucothionine, methylene blue*

thiono The divalent radical, =CS Cf *thio-carbonyl, thione**

thionuric acid $C_4H_5O_6N_3S$ = 223 14 Sulfami-dobarbituric acid The heterocyclic compound



thionyl Sulfinyl The divalent group, =SO, from sulfurous acid Cf *sulfoxide, thienyl*

t amines An organic compound of the type, R N SO *E g*, thionylmethylamine, Me-N SO, b 58, thionylethylamine, EtN SO, b 75

t aniline C_6H_5ONS = 139 1 PhN SO A colorless liquid, d 1 236, b 200, used in organic synthesis

t benzene $C_{12}H_{10}OS$ = 202 1 Diphenylsulfoxide, Ph_2SO Colorless crystals, m 70

t bromide $SOBr_2$ = 207 91 A red liquid, b $_{40mm}$ 68

t chlorobromide SOClBr = 163 45 A yellow liquid, b 115

t chloride $SOCl_2$ = 118 9 A colorless, pungent liquid, b 79, used in organic synthesis

t dialkylamine An organic compound of the type, R_2N SO NR_2, as thionyldiethylamine, $(Et_2N)_2SO$, b 118 They may be considered as carbamides (ureas) in which the carbon atom is replaced by a tetravalent sulfur atom, or as substituted amides of sulfurous acid Cf alkyl *sulfamide*

t fluoride SOF_2 = 86 07 A colorless gas, b −32 It forms with ammonia the compounds, $2SOF_2\ 5NH_3$ and $2SOF_2$-$7NH_3$

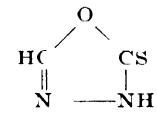
t hydrazine An organic compound of the type, R_2N N SO *E g*, thionyldiethyl-hydrazine, Et_2N NSO

t imide SONH = 63 2 A colorless liquid, m −85, prepared by the action of ammonia on t chloride It polymerises at −70°C to a yellow transparent resin, soluble in alcohol or acetone, insoluble in most other organic solvents or water

t toluidines C_7H_7ONS = 153 1 Me C_6H_4N-S O ortho-, b 184, meta-, b 220, para-, m 7, b 224 Used in organic synthesis

thio-oxamide $(CSNH_2)_2$ = 120 18 A solid, soluble in alcohol or ether, decomp by heat

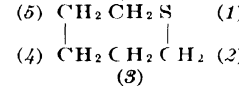
thio-oxybiazoline The heterocyclic compound



It is known only in the form of its derivatives, as, n-naphthyl-amido-, NH_2—C_2ON S—$C_{10}H_7$

thio-oxydiphenylamine Sulfaminol

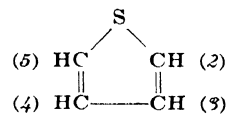
thiophane $C_5H_{10}S$ = 92 15 The heterocyclic compound



Cf *pyrane*

thiophanes $C_nH_{2n}S$ A group of sulfurated hydrocarbons from crude petroleum

thiophen(e) C_4H_4S = 84 11 Thiofuran The heterocyclic compound,



A colorless, benzene-like liquid, $d_{15°}$ 1 071, m −37, b 84 insoluble in water, soluble in alcohol or ether It forms numerous deriva-tives, used in organic synthesis Cf *thienyl*

amino- Thiophenine **benzo-** Thionaphthene **methyl-** Thiotolene **nitro-** q v **tetrahydro-** Butylene sulfide **tetraphenyl-** Thionessal

t alcohol C_4H_3S CH_2OH = 114 13 A liq-uid, b 207 **t carboxylic acids** A group of acids derived from thiophen

$C_4H_3S\,COOH$ = 128 12

2-thiophen carboxylic acid	m 126, b 260
3-thiophen carboxylic acid	m 136

$C_4H_2S(COOH)_2$ = 172 2

2 3-thiophen dicarboxylic acid	m 260
2 4-thiophen dicarboxylic acid	m 118
2 5-thiophen dicarboxylic acid	b 30

t biniodide $C_4H_2I_2S$ = 336 0 Thiophen diiodide Yellow leaflets m 40, insoluble in water, soluble in alcohol, ether or chloroform Used as an iodoform substitute and antiseptic **t sulfonate** $C_4H_3S\,HSO_3$ = 164 1 Colorless crystals, insoluble in water The sodium salt is used as an antiseptic **t tetrabromide** C_4Br_4S = 400 0 A yellow crystalline powder, m 112, b 326 insoluble in water, soluble in alcohol It is used medicinally as an antiseptic

thiophenine C_4H_5NS = 99 1 Aminothiophen, $C_4H_3S\,NH_2$ A yellow, oily liquid, insoluble in water

thiophenol C_6H_6S = 110 1 Phenthiol, phenylmercaptan, phenylthiol* phenylsulfhydrate, PhSH A colorless liquid, d 1 078, b 168, insoluble in water, soluble in alcohol or ether, used in organic synthesis **ethenylamino-** q v

thiophenyl The monovalent radical PhS—, derived from thiophenol Cf *phenoxy* **t acetone** A colorless liquid, m 3, b 266, soluble in alcohol

thiophosgene $CSCl_2$ = 115 0 Thiocarbonyl chloride, carbonthionyl chloride A red liquid, d 1 508, b 73, insoluble in water, soluble in alcohol or ether

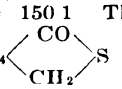
thiophosphates A group of compounds derived from phosphoric acids by substituting divalent sulfur for one or more oxygen atoms, as,

*mono*thiophosphates	M_3PO_3S
*di*thiophosphates	$M_3PO_2S_2$
*tri*thiophosphates	M_3POS_3
*tetra*thiophosphates	M_3PS_4

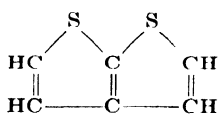
thiophosphoric acid $PS(OH)_3$ = 114 12 A solid, decomp by water, soluble in alcohol **t anhydride** Phosphorus pentasulfide

thiophosphorous anhydride Phosphorus trisulfide

thiophosphoryl The trivalent radical, PS≡ derived from thiophosphoric acid **t bromide** $PSBr_3$ = 302 86 A yellow solid, d 2 85, m 38 decomp by further heat and by water **t chloride** $PSCl_3$ = 169 5 A colorless liquid $d_0°$ 1 68, b 126, decomposed by water **t triamide** $PS(NH_2)_3$ = 111 18 A white solid, decomp by heat or water, d 1 7

thiophthalide C_8H_6OS = 150 1 The heterocyclic compound,  Colorless crystals, m 60

thiophthene $C_6H_4S_2$ = 140 10 Bithiophene The heterocyclic compound,



A colorless liquid, b 225, insoluble in water soluble in alcohol

thiopyrophosphoryl bromide $P_2S_3Br_4$ = 477 94 A yellow liquid, decomp by water or heat

thioresorcinol $C_6H_4(SH)_2$ = 142 19 A yellowish-gray powder, m 27, b 243, insoluble in water, used medicinally as an antiseptic

thiosemicarbazide CH_5N_3S = 91 1 $H_2N\,CS\text{-}NH\,NH_2$ Colorless needles, m 181, soluble in water, used in organic synthesis, and as reagent for aldehydes and ketones

thiosinamine Allylsulfocarbamide **t ethyliodide** $C_4H_8N_2S\,C_2H_5I$ = 272 1 Tiodine Colorless crystals, soluble in water or alcohol, used in medicine

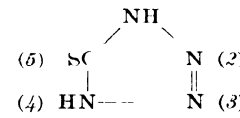
thiostannates A salt of thiostannic acid, M_2SnS_3

thiostannic acid H_2SnS_3 = 216 9 Yellow unstable crystals

thiosulfate A salt of thiosulfuric acid of the type $M_2S_2O_3$ Cf *sodium t*, *thionate*

thiosulfuric acid $H_2S_2O_3$ = 114 0 An unstable acid decomp readily to sulfur and sulfurous acid

thiotetrazoline The heterocyclic compound,



known in its compounds, *e g*, 1-phenylthiotetrazoline, $Ph(CHN_4S)$, m 142

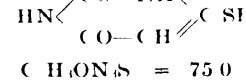
thiotolene C_5H_6S = 98 13 Methylthiophen A homolog of thiophen, C_4H_3MeS

2- or alpha-	m 13 b 113
3- or beta-	b 120

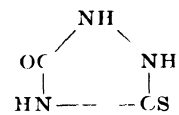
thiotriazole CHN_3S = 87 1 The heterocyclic compounds

1 2 3 4-triazsulfole 1 2 3 5-

thiouramil $C_4H_4O_2N_2S$ = 141 1 The heterocyclic compound,



thiourazole $C_2H_4ON_2S$ = 75 0 The heterocyclic compound,



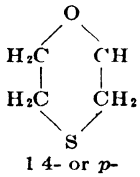
Colorless crystals, m 177, soluble in alcohol

thiourea CH_4N_2S = 76 1 Sulfourea, sulfocarbamide, thiocarbamide, $NH_2\,CS\,NH_2$ or $NH_2\,CNH\,SH$ Colorless prisms d 1 42, m 180, slightly soluble in water, alcohol or ether Used in organic synthesis, and as reagent for bismuth **allyl-** See *allylsulfocarbamide* **benzoyl-** q v **benzyl-** q v **diethyl-** q v **dimethyl-** q v **diphenyl-** Sulfocarbanilide **ethyl-** q v **glycol-** q v **phenyl-** q v **pseudo-** $NH_2\text{-}CNH\,SH$ Cf pseudo-*urea*

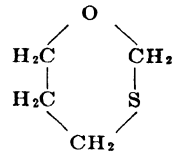
thiourethane C_3H_7ONS = 105 14 The solid, $NH_2\,CO\,SEt$, m 108 (sublimes), insoluble in water, soluble in alcohol or ether

thioxalic acid $C_2H_2O_2S_2$ = 122 08 $(CO\,SH)_2$ Cf *rubeane*

thioxane C_4H_8OS = 104 1 The heterocyclic compounds,

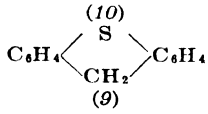


1 4- or *p*-



1 3- or *m*-

thioxanthene $C_{13}H_{10}S$ = 198 1 Methylenediphenylenesulfide,

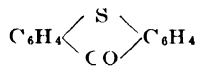


(*10*)

(*9*)

Colorless crystals, m 128, b 340, used in organic synthesis

thioxanthone $C_{13}H_8OS$ = 212 1 Benzophenone sulfide



Colorless crystals, m 207, b 340

thioxene C_6H_8S = 112 13 Dimethylthiophen, $C_4H_2Me_2S$ A homolog of thiophen, four isomers

2 3-	b 136	2 5-	b 135
2 4-	b 138	3 4-	b 145

thiozon An allotrope of sulfur, q v

third law of thermodynamics See *thermodynamics entropy*

third order See *reactions, tertiary*

thiuram (1) The radical $R_2N\,CS$ — (2) $C_6H_{12}N_2S_4$ = 240 35 Bis(dimethylthiocarbamyl)-disulfide, $(Me_2N\,CS\,S)_2$ Yellow crystals, d 1 29, m 155 **ethyl-** $C_{10}H_{20}N_2S_4$ = 296 41 Bis(diethylthiocarbamyl)-disulfide, tetraethylthiuramdisulfide, $(Et_2N\,CS\,S)_2$ Yellow crystals m 70 **t disulfide** A compound of the type $R_2N\,CS\,S\,S\,CS\,NR_2$ **t monosulfide** A compound of the type $R_2N\,CS\,S\,CS\,NR_2$ Cf *xanthogenate*

thiurea Thiourea

thiuret $C_6H_7N_3S_2$ = 185 2 A colorless crystalline powder, insoluble in water, soluble in alcohol or ether, used medicinally as an iodoform substitute

thixotrope A colloid whose properties are changed by mechanical treatment, as, clay

thixotropic Pertaining to thixotropy **t viscosity** The anomalous viscosity of sols which are about to gel

thixotropy The property of certain gels of becoming fluid on shaking, and coagulating again when left at rest, as, a suspension of ferrous hydroxide It is explained by the mechanical destruction of the zones (q v) of oriented molecules

Thomas, Sidney Gilchrist 1850–1885 An English technologist noted for his improvement of the Bessemer process **T meal** Basic slag **T process** The use of burned dolomite as a converter lining, which reacts with the phosphorus of the pig iron **T slag** The finely-powdered basic slag obtained in the Thomas process It consists of phosphates, and is used as a fertilizer

Thompson, Benjamin See *Rumford*

Thompson process Welding by means of an electric arc with the metal as an electrode

Thomsen, Hans Peter Jürgen Julius 1826–1909 A Danish chemist, noted for his work in thermochemistry **T process** The manufacture of soda and alumina by heating powdered cryolite with lime leaching out the sodium aluminate, and decomposing the latter into aluminum hydroxide and sodium carbonate by means of carbon dioxide

thomsenolite $NaCaAlF_6\,H_2O$ A native fluoride of aluminum, calcium, and sodium

Thomson, Sir Joseph John 1856–1940 An English physicist noted for work in theoretical physics, discoverer of the electron and Nobelist in 1906 **T, Thomas** 1773–1852 An English chemist noted for his textbooks **T, William** Lord Kelvin

thomsonite A variety of zeolite sometimes used as a gem It is a hydrous aluminum sodium calcium silicate

thoria Thorium oxide

thorianite A complex mineral which contains 70 % thorium oxide, 10–12 % uranium oxide, and rare earths

thorite $ThSiO_4$ A native thorium silicate, containing Ca, Fe, Mn, and V, varieties are freyalite and orangite

thorium Th = 232 12 A metal and element atomic number 90 It occurs in monazite and thorite, and was discovered in 1828 by Berzelius A gray, amorphous or crystalline, soft mass, readily burning in air to thorium oxide, d 11 2 m 1700 insoluble in water, alcohol, alkalis or acids, soluble in aqua regia Thorium is radioactive and disintegrates into a series of elements Cf *radioactive elements isotopes* **meso-** See *mesothorium* **radio-** See *radiothorium*

t Ω Hibernium **t anhydride** T oxide **t chloride** $ThCl_4$ = 374 2 Colorless, deliquescent plates, d 4 59, m 820 (sublime), soluble in water alcohol or ether, used in the manufacture of incandescent burners **t dioxide** T oxide **t emanation** Thoron, Tn A radioactive gas, a disintegration-product of thorium **t hydroxide** $Th(OH)_4$ = 300 4 A colorless, gelatinous substance, insoluble in water or alcohol Formed on adding a hydroxide solution to thorium salt solutions **t lead** ThD See *radioactive elements* **t nitrate** $Th(NO_3)_4\,3H_2O$ = 534 2 A white, hygroscopic, crystalline or granular powder, soluble in water, decomp to thorium oxide by heat Used extensively in the manufacture of Welsbach mantles **t oxalate** $Th(C_2O_4)_2$ = 408 12 White crystals, d 4 637, insoluble in water, soluble in ammonium oxalate solution *hexahydrate-* $Th(C_2O_4)_2\,6H_2O$ = 516 21 White amorphous powder **t oxide** ThO_2 = 264 1 Thoria, t dioxide A white amorphous, infusible powder, d 9 9, insoluble in water or acids, it constitutes a large proportion of the white ash of incandescent gas mantles Used medicinally as substitute for bismuth subnitrate in taking x-ray pictures **t picrate** $Th(C_6H_2N_3O_7)_4\,10H_2O$ = 1324 43 A yellow powder, highly explosive **t series** See *radioactive elements* **t sulfate** $Th(SO_4)_2\,4H_2O$ = 496 2 Colorless crystals, slightly soluble in water **t x** ThX A radioactive substance produced from thorium, through the three intermediate products, Mesothorium I and II, and radiothorium (See *radioactive series*)

thornapple Stramonium

thorogummite $UO_2\,3ThO_2 3SiO_2\,6H_2O$ A native hydrous silicate of thorium and uranium

thoron Tn = 220 Thorium emanation, ThEm An isotope of radon (niton), and member of the thorium series (See *radioactive elements*)

thorotrast A colloidal preparation of thorium oxide

thoroughwort Eupatorium

Thorpe, Jocelyn Field 1872–1940 An English chemist noted for organic synthesis, author and co-editor of *Thorpe's Dictionary of Applied Chemistry* **T, Thomas Edward** 1845–1925 An English chemist noted for atomic weight determinations, and studies on gold

thortveitite A mineral, consisting chiefly of scandium silicate

Thoulet's solution A concentrated solution of potassium and mercuric iodides in water, d 3 17, used to determine the density of minerals by the suspension method

thread (1) A string, q v (2) A unit of worsted yarn measure, 36 inches

three-dimensional Pertaining to the three dimensions length, width and height **t diagram** A graph showing the relationships along the x, y and z axes of coordinates, q v

threonic acid $C_4H_8O_5$ = 136 1 The hydroxy-acid, $CH_2OH(CHOH)_2COOH$ from threose

threonine α-Amino-β-hydroxy butyric acid

threose $C_4H_8O_4$ = 120 1 A tetrose and isomer of erythrose It occurs in d- and l-forms

threosic acid $C_4H_6O_5$ = 134 1 The aldehyde-hydroxy acid, $CHO(CHOH)_2COOH$ from threose

threshold (From the German schwellen weit) Liminal value

thrombase Thrombin, zymoplasm The coagulating enzyme of the blood that transforms fibrinogen to fibrin, thus causing the coagulation of the blood

thrombin Thrombase

thrombocytes Blood platelets

thrombogen Serozyme A substance of the blood that gives the enzyme, thrombase, with thrombokinase

(serozyme) thrombogen + (cytozyme) thrombokinase → thrombase (enzyme)

thrombokinase Thrombozym A substance in the blood cells that causes the formation of thrombase, and thence the clotting of blood Cf *coagulen, fibrinogen*

thromboplastin An extract of cattle brain Used, in physiological salt solutions, as a hemostatic, and also in surgery

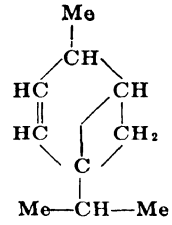
thrombosis The formation of clots or plugs in the blood vessels

thrombozym Thrombokinase

throwing power The efficiency of an apparatus or electrolyte for the electro-deposition of metals It is measured by $(L - M)100/(L + M - 2)$, where L is the ratio of the distance between the anode and two half-cathodes in the liquid, and M is the ratio of the weights of metal deposited on the two half-cathodes

thuja Thuya Arbor vitae, white cedar, tree of life The dried, leafy young tops of *Thuja occidentalis*, a Pinaceae of North America and Europe It contains an essential oil and tannin, which is used medicinally as a diuretic and sudorific **t oil** Oil of white cedar An essential oil from thuja It has a sharp, camphor-like odor and taste, d 0 925, b 190, insoluble in water, soluble in alcohol It contains pinene, fenchene, thujone and carvone

thujene $C_{10}H_{16}$ = 136 2 Tanacetene A terpene obtained from thuja oil,



hydroxy- Thujol

thujetic acid $C_{28}H_{22}O_{13}$ = 566 2 A compound obtained by heating thujin with barium hydroxide

thujetin $C_{14}H_{14}O_8$ = 310 1 A colorless, crystalline substance formed by hydration of thujigenin It resembles quercitrin

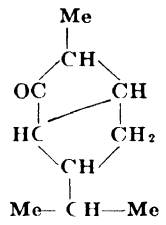
thujigenin $C_{14}H_{12}O_7$ = 292 1 A decomposition product of thujin Cf *thujetin*

thujin $C_{20}H_{22}O_{12}$ = 454 18 A glucoside and coloring matter of thuja Yellow crystals, insoluble in water, soluble in alcohol It hydrolyzes to thujigenin

thujoid The combined principles of thuja, used medicinally

thujol $C_{10}H_{16}O$ = 152 2 Absinthol Hydroxythujene An alcohol in thuja oil

thujone $C_{10}H_{16}O$ = 152 2 Thalviol, 6-keto-sabinane salviol, tanacetone The dextrorotatory ketone,



A colorless liquid, d 0 913 b 203, from the essential oil of *Thuja* and *Salvia* species, insoluble in water, soluble in alcohol

thujorhodin Rhodoxanthin

thujyl The monovalent radical, $C_{10}H_{17}$—, derived from sabinane

thulite Zoisite

thulium Tm (or Tu) = 169 4 A rare earth metal and element, atomic number 69 It has a valency of three, and was discovered by Cleve in 1879 and independently by Soret Its salts are greenish white **t chloride** $TmCl_3$ = 275 8 Colorless crystals, soluble in water **t oxalate** $Tm_2(C_2O_4)_3\,6H_2O$ = 710 89 Greenish white precipitate, soluble in alkaline oxalate solutions **t oxide** Tm_2O_3 = 386 8 A white amorphous powder, insoluble in water

thuringite $4(AlFe)_2O_3,7FeO,6SiO_2,9H_2O$ An amorphous mineral

thus Olibanum

thuya Thuja

thymacetin $C_6H_2MeC_3H_7(OEt)NHC_2H_3O$ Thymol-phenacetin A white crystalline pow-

der, slightly soluble in water, soluble in alcohol, used medicinally as a hypnotic and analgesic

thymamine $C_{22}H_{40}O_5N_6$ = 468 2 A protamine isolated from the thymus gland

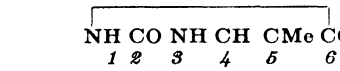
thyme Thymus The dried tops of *Thymus vulgaris*, (garden thyme) a Labiatae Used, as the fluid extract, as an aromatic carminative, also in cooking as a flavoring **t camphor** Thymol **t oil** The volatile oil of t , d 0 894–0 930, soluble in alcohol and occurring in many grades

thymegol See *egol*

thymene $C_{10}H_{16}$ = 136 2 A terpene from thyme oil A colorless aromatic liquid, d 0 868, b 160, insoluble in water, soluble in alcohol, used as an antiseptic Cf *thymine*

thymidol Methylpropylphenylmenthol A condensation-product of thymol and menthol, used as an antiseptic mouth wash

thymine $C_5H_6O_2N_2$ = 126 06 5-Methyluracil,



Colorless crystals, decomp 335, a constituent of nucleic acids Cf *thymene*

thyminic acid Solurol

thymiodol Thymol iodide

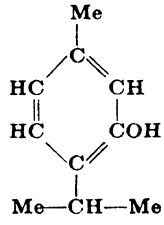
thymipin A dialyzate of *Thymus vulgaris*, *Drosera rotundifolia* and *Pinguicula alpine* Used in the subcutaneous treatment of whooping cough

thymodin Thymol iodide

thymoform $C_{21}H_{28}O_2$ = 312 3 A condensation-product of thymol and formaldehyde, CH_2 - $(C_6H_3Me_3CH_7O)_2$ A yellow powder, insoluble in water, soluble in alcohol or ether Used as an antiseptic dusting powder

thymohydroquinone $C_{10}H_{14}O_2$ = 166 16 A solid, m 140, b 290, slightly soluble in water, soluble in alcohol or ether

thymol $C_{10}H_{14}O$ = 150 2 Thyme camphor, p-propyl-m-cresol, 3-methyl-6-iso-propylphenol, 3-hydroxy-*p*-cymene, 1-methyl-3-hydroxy-4-isopropyl-benzene



Colorless crystals, d 0 979, m 50, b 230, slightly soluble in water, soluble in alcohol or ether Used as a reagent for indican, and medicinally, as an antiseptic **acetyl-** q v **diiodo-** T iodide **hexahydro-** Menthol

t blue $C_{27}H_{30}O_5S$ = 466 23 T sulfonphthalein A black powder, used as pH indicator, changing from pink (1 5) to yellow (2 8–8) to blue (9 6) **brom-** See *indicators*

t cambamate $C_{11}H_{15}O_2N$ = 193 2 Thymol urethane, thymotal, tyratol, thymolcarbamic ether, $C_{10}H_{13}OCO\ NH_2$ A colorless crystalline powder, slightly soluble in water, decomp by hydroxides, used medicinally as an intestinal antiseptic **t iodide** $(C_{10}H_{13}OI)_2$ = 552 Diiodothymol, aristol, annidalin, thymotol, iodohydromol, iodosol, thymiodol, thymodin A reddish-brown powder, obtained by the treatment of thymol with iodine in alkaline solution, insoluble in water, soluble in alcohol, used medicinally as an iodoform substitute and antiseptic **t phenacetin** Thymacetin **t phthalein** A pH indicator changing at 9 8 from colorless (acid) to blue (basic) **t salicylate** Salithymol **t sulphonphthalein** T blue **t urethane** T carbamate

thymoquinone $C_{10}H_{12}O_2$ = 164 15 Colorless crystals, m 46, b 232, soluble in water, alcohol or ether

thymotal Thymol carbamate

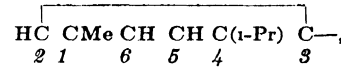
thymotic acid $C_{11}H_{14}O_3$ = 194 27 $C_6H_2(Me)$-$C_3H_7(OH)COOH$ Colorless crystals, m 127° (sublime), soluble in alcohol or ether **t. alcohol** Methyl-2-propyl-benzyl alcohol **t anhydride** $C_{11}H_{12}O_2$ = 176 15 Colorless crystals, m 174

thymotol Thymol iodide

thymovidin A hormone from thymus

thymus (1) Thyme (2) A lymph-gland in the neck and chest of an infant or young animal, which disappears before maturity is reached Cf *thymamine* **t histon** A protein from t , mol wt = 6000, which lowers the pressure and coagulability of blood

thymyl The monovalent radical,



derived from thymol

thynnin A protamine (75 % arginine) from the sperm of *Thymnus thynnus*, the tunny fish of the Pacific Ocean

thyraden A dried extract of the thyroid gland, used medicinally for rickets and cretinism

thyratron A gas-filled, hot-cathode, grid-controlled valve rectifier and self-amplifier

thyresol $C_{15}H_{22}OMe$ = 234 21 Santalol methyl ester A colorless liquid, used medicinally as a santalol substitute in urethritis

thyroglobulin A pseudoglobulin containing thyroxine and diiodotyrosine, it is considered to be the thyroid hormone

thyroid Thyroideum siccum The dried thyroid glands of animals A yellowish powder, slightly soluble in water, used medicinally as an alterative **t gland** A large gland in front and on either side of the windpipe of man and animals, it produces thyroxine

thyroidectin The dried blood of animals from which the thyroid gland has been removed, used medicinally in goiter

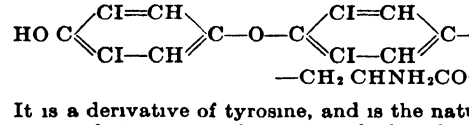
thyroidine A crystalline iodine-free substance obtained from thyroid

thyroiodine Thyroxine

thyro-oxindole Thyroxine

thyrotrophin The active principle of the anterior lobe of the pituitary gland, it acts on the thyroid gland

thyroxine $C_{15}H_{11}O_4NI_4$ = 776 8 Thyro-oxyindol, iodothyroglobulin, thyroiodine,



It is a derivative of tyrosine, and is the natural or synthetic active hormone of the thyroid gland Colorless crystalline needles, m 250, insoluble in water Used medicinally for goiter, cretinism and myxedema

Ti The symbol for titanium

tiemannite HgSe Native mercurous selenide

tiglaldehyde C_5H_8O = 84 06 Guaiol, tiglic aldehyde, *2*-methyl-*2*-butenal*, MeCH CMe-CHO A colorless liquid, d 0 870, b 116 5

tiglic Pertaining to tiglium **t acid** $C_5H_8O_2$ = 100 1 Methylcrotonic acid, iso-angelic acid, cevadic acid, *2*-methyl-*2*-butenoic acid* An unsaturated, monobasic acid, which occurs in two isomeric forms in croton oil and chamomile oil

cis- or *tiglic acid* trans- or *angelic acid*, q v

Colorless prisms, d 0 964, m 64, b 198, slightly soluble in water, soluble in alcohol or ether Its isomer is angelic acid (q v) **t aldehyde** Tiglaldehyde

tiglium Croton seeds The dried seeds of the croton oil plant, *Croton tiglium*, an Euphorbiaceae of the East Indies and Philippines It contains croton oil, tiglic acid and crotonol, used as a drastic purgative

tikitiki Darak

tile ore Cuprite

tilia Linden flowers, lime flowers The dried flowers of *Tilia europea*, a Tiliaceae of Europe It contains an essential oil, used as an antispasmodic and tonic

Tillmans' reagent *2 6*-Dichlorophenol indophenol, which is a quantitative reducing agent for ascorbic acid

timbo The bark of *Serjania curassavica*, a Sapindaceae of Brazil, it contains an alkaloid and is used by natives as a fish-poison

timbonine An alkaloid from timbo

time (1) The fourth dimension, a measure of duration of an object, phenomenon or event The standard unit is the second, *i e*, 1/86,400 part of a mean solar day, 1 second equals 1000 σ Sensitive measurements of time are made with a tuning fork (registers $\frac{1}{10}\frac{1}{00}$ to $\frac{1}{50}\frac{1}{00}$ second) Longer periods are measured in days (q v) and years, q v The velocity of light per meter is 10^{-8} second (See table) (2) The relative hour of a day, which depends on geographical longitude and the position of the earth relative to the sun Cf *year*

MAGNITUDES IN TIME

Sun diminishing one half its mass		$1\ 5 \times 10^{19}$ sec
Thorium, average life	25,000 000 000 yrs	$7\ 7 \times 10^{17}$ sec
Uranium, average life	6,300,000,000 yrs	$1\ 9 \times 10^{17}$ sec
Earth age (He in rocks)	2,000 000,000 yrs	6×10^{16} sec
Universe, doubling in size	1,400 000,000 yrs	$4\ 3 \times 10^{16}$ sec
Earth Proterozoic era	850,000,000 yrs	$2\ 6 \times 10^{16}$ sec
Earth Paleozoic era	420,000,000 yrs	$1\ 3 \times 10^{16}$ sec
Sun period in Milky Way	200,000 000 yrs	$6\ 2 \times 10^{15}$ sec
Earth, Quaternary period	1,500,000 yrs	$4\ 6 \times 10^{13}$ sec
Ionium average life	120 000 yrs	5×10^{12} sec
Dawn of history	6,000 yrs	$1\ 9 \times 10^{11}$ sec
Birth of Christ	1,943 yrs	6×10^{10} sec
Pluto period around sun	282 yrs	$8\ 7 \times 10^{9}$ sec
Neptune period around sun	164 7 yrs	5×10^{9} sec
Steam engine invented	162 yrs	$4\ 9 \times 10^{9}$ sec
Oxygen discovered	162 yrs	$4\ 9 \times 10^{9}$ sec
Urea synthesized	107 yrs	$3\ 1 \times 10^{9}$ sec
Man, average life	42 yrs	$1\ 3 \times 10^{9}$ sec
Radium and x-ray discovered	35 yrs	1×10^{9} sec
1 year = 31,536,000 sec		$3\ 1 \times 10^{7}$ sec
Earth period around sun	365 2 days	$3\ 1 \times 10^{7}$ sec
Mercury period around sun	87 96 days	$7\ 6 \times 10^{6}$ sec
Uranium X^1 average life	35 4 days	3×10^{6} sec
Moon period around earth	27 8 days	$2\ 3 \times 10^{6}$ sec
Sun rotation	24 6 days	2×10^{6} sec
Radium E, average life	7 days	6×10^{5} sec
1 day = 86 400 sec		$8\ 6 \times 10^{4}$ sec
Earth rotation, 23h 56m	4 sec	$8\ 6 \times 10^{4}$ sec
1 hour = 3 600 sec		$3\ 6 \times 10^{3}$ sec
Radium A, average life, 4 5 sec		270 sec
1 minute = 60 seconds		60 sec
1 second = 1 000 sigmas (σ)		1 sec
Motion-picture image on screen	64σ	$6\ 4 \times 10^{-2}$ sec
Engine wheel period (1 500 r p m)	40σ	4×10^{-2} sec
Alternating current cycle	10σ	1×10^{-2} sec
Sound vibration (C_3)	4σ	4×10^{-3} sec
Sound vibration (C_4)	2σ	2×10^{-3} sec
Photographic shutter, fastest	1σ	1×10^{-3} sec
1 sigma (σ) = 1,000 millisigma ($m\sigma$)		1×10^{-3} sec
Chromatine image	$100\ m\sigma$	1×10^{-4} sec
Oscillograph	$1\ m\sigma$	1×10^{-6} sec
Radium C', average life	$1\ m\sigma$	1×10^{-6} sec
1 millisigma ($m\sigma$) = 1 000 microsigma ($\mu\sigma$)		1×10^{-6} sec
High frequency cycle	$100\ \mu\sigma$	1×10^{-7} sec
Radio oscillation	$80\ \mu\sigma$	8×10^{-8} sec
Lingering period of excited atom	$1\mu\sigma$	1×10^{-9} sec
Thorium C' average life	$1\mu\sigma$	1×10^{-9} sec
1 microsigma ($\mu\sigma$) = 0 000 000 001 second		1×10^{-9} sec
Yellow light oscillation		5×10^{-14} sec
Cosmic ray oscillation		1×10^{-22} sec

tin Sn = 118 70 Stannum A metal and element, atomic number 50 A silver-white, rhombic or tetragonal metal, d 7 29, m 232, b 2270, insoluble in water, decomp in dilute acids or concentrated alkalis Crystalline forms

$Sn\beta$ gray tin d 5 85 brittle	18°C ⇋	Sn_α tetragonal d 7 29 malleable	170°C ⇋	Sn_γ rhombic d 6 56 brittle

Tin has a valency of two and four, and forms two series of compounds

valency	2	4
cations	Sn^{++}, stannous	Sn^{++++}, stannic
anions	SnO_2^{--}, stannites	SnO_3^{--}, stannates

The tin-organic compounds are derived mainly from tetravalent t It is used as a metal, in alloys for t foils, solders, utensils, type metal, dental alloys, and in the manufacture of tin salts The World output in 1941 was 237,000 long tons, produced chiefly in the Federated Malay States > Dutch East Indies > Bolivia > Thailand > China > Nigeria

alpha- White t **beta-** Gray t **black-** A treated t ore which contains 60–70 % SnO_2 **block-** Cassiterite **butter of-** Stannic chloride **cry of-** The sound heard on bending a stick of tin **flowers of-** Stannic oxide **gray-** Beta t, β-tin An enantiotropic form of white t produced as a gray powder when the white t is cooled to −40°C, the transition point is 18°C It is the cause of tin disease, q v **stream-** Tinstone, occurring in an alluvial deposit **tetraphenyl-** See *t tetraphenyl* **white-** Alpha-, ordinary-, α-tin The usual form of malleable tin

t acetate Stannous acetate **t alkyls.** A compound of the type SnR_4 See *stannanes, t tetraethyl, t tetramethyl, etc* **t alloys** A mixture of tin and other metals The melting points of some binary alloys are

with	90 % Sn 10 %	80 % Sn 20 %	70 % Sn 30 %	60 % Sn 40 %	50 % Sn 50 %
Al	540°C	560°C	570°C	590°C	605°C
Ag	300°C	375°C	420°C	450°C	495°C
Sb	255°C	310°C	350°C	395°C	430°C
Cu	440°C	530°C	580°C	630°C	680°C
Pb	216°C	200°C	185°C	190°C	220°C
Ni	800°C	1060°C	1230°C	1305°C	1290°C

Cf tables under *Al, Co, Pb, Ni, Ag,* also *babbitt, Britannia, pewter, rhine-metal, solder* **t ammonium chloride** Pink salt **t anhydride** Stannic oxide **t ash** Stannic oxide **t bath** Molten tin into which metals are dipped, and so coated with a film of tin **t bichloride** (1) Stannic chloride (2) Sodium stannic chloride, Na_2SnCl_6 **t bisulfide** T disulfide **t bronze** Stannic sulfide **t chlorides** (1) Stannous chloride (2) Stannic chloride **t chloride solution** A solution of 5 pts stannous chloride in 1 pt hydrochloric acid A slightly yellow, refractive liquid, d 1 9, used as a reagent **t chromate** See *stannic* or *stannous chromate* **t citrate** Stannous citrate **t dichloride** Stannous chloride **t diethyl** * $Sn(C_2H_5)_2$ = 176 8 Stannous ethide An oily liquid, d 1 654, decomp by heat, insoluble in water, soluble in alcohol **t dioxide** Stannic oxide **t disease** The transformation into grey t and the resulting brittleness and loss of metallic luster **t disulfide** Stannic sulfide **t foil** A thin sheet of tin or tin alloy, used for wrapping food and other articles to prevent them drying out **t glass** (1) A glass that contains tin, as, certain flint glasses (2) An obsolete name for bismuth **t glaze** An opaque glaze formed on pottery by tin salts **t hydroxide** Stannic hydroxide **t iodide** Stannic iodide **t minerals** The chief ore of tin is the oxide, cassiterite Others are

cassiterite	SnO_2
stannite	Cu_3FeSnS_4
teallite	$PbSnS_2$
cylindrite	$Pb_3FeSn_4Sb_2S_{14}$
nordenskioldine	$CaSnB_2O_6$

t monosulfide Stannous sulfide **t monoxide** Stannous oxide **t mordant** A tin salt used in dyeing, as, stannous chloride or stannic chloride **t oxalate** Stannous oxalate **t oxide** See *stannous oxide, stannic oxide* **t oxychloride** Stannous chloride **t oxymuriate** Commercial stannic chloride, $SnCl_4 5H_2O$ **t peroxide** Stannic oxide **t pickling** The process of immersing iron in diluted acids prior to a tin bath **t plate** A sheet iron or steel covered with a film of tin **t protochloride** Stannous chloride **t protoxide** Stannous oxide **t pyrites** Stannine **t salt** Stannous chloride **t spar** Cassiterite **t sponge** Argentine **t stone** Cassiterite **t sulfate** Stannous sulfate **t tetraethyl** * $Sn(C_2H_5)_4$ = 234 9 Stannic ethide A colorless liquid, d 1 187, b 181, insoluble in water, soluble in alcohol **t tetramethyl** * $Sn(CH_3)_4$ = 178 81 Stannic methide A colorless liquid, d 1 314, b 78, insoluble in water, soluble in alcohol **t tetraphenyl** * $Sn(C_6H_5)_4$ = 426 7 Stannic phenide Colorless crystals, m 226, b 420, soluble in ether **t triethyl** * $Sn_2(C_2H_5)_6$ = 411 7 Distannic ethide, $Et_3Sn—SnEt_3$ A colorless liquid, b 270, insoluble in water or alcohol **t triethylhydroxide** $Sn(C_2H_5)_3OH$ = 222 7 Stannic ethylhydroxide, Et_3SnOH Colorless crystals, m 66, b 272

tincal Borax

tincture A medicated liquid made by extraction of a drug and generally weaker in strength than a fluid extract **alcoholic**- A solution made by percolating 10 gms of a drug with 100 cc of alcohol, or macerating the same quantity of a resinous drug **aqueous**- An extract made with water

t of iodine A solution of 7 gm iodine and 5 gm potassium iodide in 5 cc water made up to 100 cc with alcohol, used medicinally as an antiseptic

tinder Inflammable charred linen or wood used for lighting furnaces

tinkal Borax

tinning Coating with a film of tin, as, tin plate

tinstone Cassiterite

tint A shade of a color

tintometer A colorimeter or device for estimating the intensity of a colored solution by comparison with standard solutions, or colored glass slides

tiodine Thiosinamine ethyliodide

tissue In biology, a structure composed of cells and cell products

titan yellow Clayton yellow, thiazol yellow A yellow dye made from dehydrothio-*p*-toluidine, used for detection of caustic alkalis (red) and magnesium (red) Cf *titanellow*

titanate A salt of titanic acid, as, M_2TiO_3—metatitanate, M_4TiO_4—orthotitanate

titanellow Yellow titanium oxide, used for making ivory shades in dental porcelain, for dental cements and for yellow tiles Cf *titan yellow*

titania Titanium dioxide

titanic Pertaining to tetravalent titanium **t acid** (1) H_2TiO_3 = 97 9 *meta-* $TiO(OH)_2$ A colorless precipitate obtained by boiling titanium sulfate solution, insoluble in water or acids, soluble in alkalis with the formation of salts (2) H_4TiO_4 = 115 9 *ortho-* $TiO(OH)_4$ A white precipitate obtained by adding acids to metatitanates, soluble in excess of acid or alkali and forming with the latter, the titanyl radical **t anhydride** Titanium oxide **t chloride** Titanium tetrachloride **t hydroxide** Titanic acid **t iron** Ilmenite **t oxide** Titanium dioxide

titaniferous Containing titanium, (mineralogical) **t iron ore** Ilmenite

titanite Sphene

titanium Ti = 47 90 A metallic element of the carbon group, atomic number 22, discovered by Gregor, 1789 It is a dark gray, amorphous metal, d 4 9, m 1800, insoluble in water, soluble in warm hydrochloric acid Used (as ferrotitanium) as a cleaning and deoxidizing agent for molten steel, and in alloys with copper, bronze and other metals Cf *konel* It has a valency of 2, 3, and 4 and forms several ions

Ti^{+++}	titanous ion
Ti^{++++}	titanic ion
TiO_3^{--}	m-titanate ion
TiO_4^{----}	o-titanate ion
TiO^{++}	titanyl ion

t bromide $TiBr_4$ = 367 8 Orange crystals, d 2 6, m 39, b 230, decomp by water **t**

chlorides See *t dichloride, t trichloride t tetrachloride* **t dichloride** $TiCl_2$ = 119 0 Titanous chloride A black, hygroscopic powder, decomp by water and burns when heated in air **t dioxide** TiO_2 = 80 1 Titania Colorless to black tetragonal or rhomic crystals d 3 70–4 26, m 1560, insoluble in water, soluble in alkalis or concentrated sulfuric acid In its pure state it is used as a white pigment for paint, water colors, inks, shoe polish, soap, rubber goods and for ceramic glazes, and as a filler for paper **t hydroxide** (1) $Ti(OH)_3$ = 98 9 Titanous hydroxide A blue black powder insoluble in water (2) $Ti(OH)_4$ = 115 9 Titanic hydroxide A white, insoluble solid **t iodide** TiI_4 = 555 8 Titanic iodide, Red octahedral crystals, m 150, b 330, soluble in water or alcohol **t minerals** Titanium is widely diffused in igneous and sedimentary rocks

ilmenite	$FeTiO_3$
pseudobrookite	$Fe_4(TiO_4)_3$
perofskite (perowskite)	$CaTiO_3$
titanite	$CaTiSiO_5$
rutile, brookite, anatase, octahedrite	TiO_2

t nitrate Titanyl nitrate **t nitride** Ti_2N_2 = 123 8 A dark powder prepared from rutile and nitrogen in the electric furnace used for dusting moulds previous to casting steel **t oxalate** $Ti_2(C_2H_4)_3\ 10H_2O$ = 539 97 Yellow prisms, soluble in water **t oxides** See *t sesquioxide, t dioxide, t trioxide* **t peroxide** T trioxide **t sesquioxide** Ti_2O_3 = 143 8 A black amorphous powder, insoluble in water soluble in concentrated acids **t sulfates** (1) $Ti(SO_4)_2$ = 240 1 Colorless crystals, soluble in water (2) $Ti_2(SO_4)_3$ = 384 0 Green crystals, insoluble in water, soluble in dilute acids It is an antiseptic **t trichloride** $TiCl_3$ = 154 5 Dark violet crystals, decomp 440, soluble in water, alcohol or acids, used as a reducing agent in analytical chemistry **t trioxide** TiO_3 = 95 9 Titanellow, q v A yellow powder **t tetrachloride** $TiCl_4$ = 189 9 Titanic chloride A colorless liquid, d 1 76 m −26 b 136, soluble in water used as a mordant in dyeing **t white** A white pigment composed chiefly of t dioxide

titanous Pertaining to trivalent titanium **t chloride** Titanium trichloride

titanox A mixture of titanium oxide and barium sulfate (3 1) kneaded with linseed oil and turpentine, and used for paints **t B** 25 % TiO_2 with 75 % $BaSO_4$ **t C** 30 % TiO_2 with 70 % $CaSO_4$

titanyl The divalent radical, TiO== **t nitrate** $TiO(NO_3)_2$ = 188 1 Titanium nitrate Colorless crystals soluble in water **t sulfate** $TiOSO_4$ = 160 1 White crystalline needles, soluble in acidic water, used as a mordant in dyeing

titer (1) A standard test for oils and waxes in which the sample is completely saponified, and the solidifying-point (or titer) of the resulting separated and washed fatty acids determined (2) The number of cc per liter by which a normal solution differs from a true standard (3) The normality of a solution as determined by titration with a standard (4) The number of grams of an element, radical or compound in one cc of a standard solution

titrant The standardized solution used for titration

titrate (1) To analyze by a volumetric method (2) The solution being titrated

titrating The process of titration Cf volumetric *analysis*

titration The volumetric determination of a constituent in a known volume of a solution by the slow addition of a standard reacting solution of known strength until the reaction is completed The end-point of the reaction is indicated by a change of color (indicators) or by galvanometric measurements **differential-** The t of equal portions of the test solution in such a way that one always contains the same volume of the titrating solution in excess of that in the other At the end-point the potential difference between the solutions in a maximum **t error** The ratio of the concentration of active ions at the end-point to the initial concentration

titre Titer

titrimeter A line-operated vacuum tube device for potentiometric titrations, in which the potential changes of the system are followed continuously and automatically on a microammeter, which may be calibrated to read e m f directly Cf *potentiometer, sectrometer*

titrol Tea tree oil The volatile oil of *Melaleuca alternifolia*, a Myrtaceae of Australia, an antiseptic Cf *melasol*

Tl Symbol for thallium, element No 81

Tm Symbol for thulium element No 69

Tn Symbol for thoron, isotope of No 86

tn Abbreviation for ton

T N A An abbreviation for trinitroaniline

T N B An abbreviation for trinitrobenzene

T N T An abbreviation for trinitrotoluene

T N X An abbreviation for trinitroxylene

tobacco Tabacum The dried leaves of *Nicotiana tabacum*, a Solanaceae It contains nicotine, nornicotine nicotianine nicotelline and other alkaloids, used medicinally as a relaxant, and in large quantities for smoking and as a fumigant and insecticide **Indian-** Lobelia **t stems** The ground waste-products of t , used as fertilizer 1 2-3 3 % N_2, 4–9 % K_2O

Tobias acid *2*-Naphthylamine-*1*-sulfonic acid, used as an intermediate

Tobin bronze An alloy of 55 pts copper, 43 pts zinc and 2 parts tin

tocopherols See *vitamins E*

toddy (1) The fermented sap of the coconut and other palms (2) A hot tea containing some spirituous liquor **t test** See *test*

Toison solution A staining solution for the red blood corpuscles 0 025 gm methyl violet (6B), 1 0 gm sodium chloride, 8 0 gm sodium sulfate, 30 cc glycerin in 300 cc water

tolamine Chlorazene

tolane $C_{14}H_{10}$ = 178 2 Bibenzyl, diphenylacetylene The unsaturated hydrocarbon, PhC CPh Colorless crystalline leaflets, m 60, b 275, insoluble in water, soluble in alcohol or ether **t sulfide** $C_{14}H_{10}S$ = 210 1 Tollalylsulfide PhC = CPh Colorless crystals,

m 174

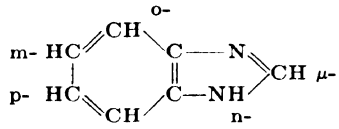
tolerance (1) The capacity to withstand the effects of a continued use of a drug (2) The limit of error permitted in the graduation of measuring instruments, as, standardized burets, or, in general, of any standardized product

tolidine $C_{14}H_{16}N_2$ = 212 22 Dimethylbenzidine, 4 4′-diamino-3 3′-dimethyldiphenyl, $NH_2MeC_6H_3\ C_6H_3MeNH_2$ **3 3′ 4 4′ -** Colorless

scales, m 129, slightly soluble in water, soluble in alcohol or ether **2 2′ 4 4′-** m 109 **1 1′ 4 4″-** m 128, a reagent **t sulfate** $C_{14}H_{16}N_2 \cdot H_2SO_4$ = 310 3 A white or reddish crystalline powder, slightly soluble in water or alcohol

olil $C_{16}H_{14}O_2$ = 238 11 Dimethylbenzil A group of ketones, $MeC_6H_4CO\ COC_6H_4Me$

olimidazole $C_7H_6N_2$ = 118 1 The heterocyclic compound,



olite Trinitrotoluene

ollalyl sulfide Tolane sulfide

'ollens, Bernhard 1841– A German agricultural chemist, noted as author **T reagent** An ammoniacal solution of silver oxide, used in testing for aldehydes and ketones

oloxy Cresoxy The monovalent radical, $Me\text{-}C_6H_4O$— or methylphenoxy group, from cresol

olu Balsam of Tolu The resinous exudation of *Myroxylon toluifera*, or *Toluifera balsamum*, a Leguminosae of tropical America, used medicinally as a stimulant and stomachic **t oil** Albahaca oil

olualdehyde C_8H_8O = 120 06 Toluic aldehyde **α-** Phenylacetaldehyde, $PhCH_2CHO$ A liquid, d 1 027, b 194 **o-** Methylbenzaldehyde, $Me\ C_6H_4CHO$ A liquid, d 1 039, b 195 5 **m-** d 1 019, b 195 **p-** d 1 020, b 204

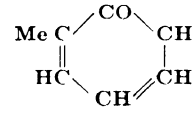
oluamide C_8H_9ON = 135 1 (1) Carbamyltoluene $Me\ C_6H_4\ CONH_2$ **ortho-** Colorless needles, m 139, slightly soluble in water, soluble in alcohol or ether **meta-** Colorless crystals, m 94, slightly soluble in water **para-** Colorless needles, m 158, slightly soluble in water, soluble in alcohol or ether, used in organic synthesis (2) α-Phenylacetamide $C_6H_5CH_2CONH_2$

oluanilide $C_{14}H_{13}NO$ = 211 11 α-phenylacetanilide, $PhNHCOCH_2Ph$ Colorless crystals, m 117

oluene C_7H_8 = 92 1 Toluol, methylbenzene, phenylmethane, PhMe A colorless, benzene-like liquid, d_{15}° 0 871, m −93 2, b 111, insoluble in water, soluble in alcohol or ether It is obtained from coal tar and is used extensively as a solvent, in organic synthesis, in the manufacture of benzoic acid derivatives, and coal-tar products For derivatives see *benzal*, *benzenyl*, *benzyl*, *benzylene*, *tolyl*, *tolylene* **amino-** Toluidine **aminohydroxy-** Cresidine **bromo-** C_7H_7Br = 171 1 Monobromtoluene, MeC_6H_4Br (1) *ortho-* A colorless liquid, d 1 41, b 182, soluble in alcohol, ether or benzene (2) *para-* Pale red crystals, soluble in alcohol or benzene *alpha-* Benzylbromide **chloro-** C_7H_7Cl = 126 6 Monochloro-p-toluene A colorless liquid, d 1 073, b 161, soluble in alcohol or ether *alpha-* Benzylchloride **cyano-** C_8H_7N = 117 1 Toluic nitrile, $CN\ C_6H_4Me$ (1) *para-* A yellow crystalline powder, m 28, b 218, soluble in alcohol, ether or benzene (2) *ortho-* A brown liquid, b 203, soluble in alcohol, ether or benzene *alpha-* Benzylcyanide **diacetylamidoazo-** Dimazon **dihydroketo-** Toluenone **isopropyl-** Cymene **nitro-** q v **nitroso-** C_7H_7ON = 121 1 Nitrosomethylbenzene, $NO\ C_6H_4\ M$ *ortho-* m 72, *meta-* m 53, *para-* m 48 **oxy-** Cresol **phenyl-** q v **trichloro-** Benzotrichloride **trinitro-** q v **trinitro-*tert*-butyl-** Artificial musk

t sulfonic acid $C_7H_8O_3S$ = 172 1 $Me\ C_6H_4\ SO_2OH$ Cf *tosyl* *ortho-* $2H_2O$ = 208 2 Colorless crystals, b 129, soluble in water or alcohol *meta-* H_2O = 190 1 Colorless needles, soluble in water, alcohol or ether *para-* $4H_2O$ = 244 1 Colorless leaflets, m 107, soluble in water, alcohol or ether *hydroxy-* Cresol sulfonic acid **t sulfonic amide** $C_7H_9O_2NS$ = 171 18 $Me\ C_6H_4\ SO_2NH_2$ *ortho-* m 155, *meta-* m 107, *para-* m 137 **t sulfochloride** $C_7H_7O_2SCl$ = 190 61 $MeC_6H_4SO_2Cl$, used as a reagent for amines **t sulfonylchloride** T sulfochloride *ortho-* m 10, b $_{10mm}$ 126, *meta-* m 12, *para-* m 66, b $_{15mm}$ 145

toluenone C_7H_8O = 108 1 The carbocyclic ketone,



toluenyl The radical C_6H_5CH= Cf *toluylene* *tolylene*

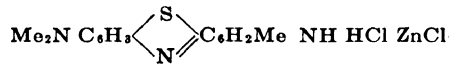
toluic acid $C_8H_8O_2$ = 136 10 Methylbenzoic acid The monobasic homolog of benzoic acid, $Me\ C_6H_4\ COOH$, three isomeric forms *ortho-* Colorless needles, m 102, b 259, soluble in water, alcohol or ether *meta-* Colorless prisms, m 110, b 263, slightly soluble in water, soluble in alcohol or ether *para-* Colorless needles, m 176, b 275, soluble in water, alcohol or ether, used in organic synthesis **alpha-** α- Phenylacetic acid, $Ph\ CH_2\ COOH$ Crystals, d 1 078, m 76 7, b 265 5 ***o*-carboxy-** Homophthalic acid **dihydroxy-α-** Homogentisic acid **α-hydroxy-α-** Mandelic acid **α-methyl-α-** Hydratropic acid **methyl-** Xylic acid

t aldehyde α-Tolualdehyde **t anhydride** $C_{16}H_{14}O_3$ = 254 2 o-Toluic acid anhydride, $(Me\ C_6H_4CO)_2O$ Colorless crystals, m 36, b 325, soluble in water **t nitrile** Cyano-*toluene*

toluidide One of a class of compounds derived from the toluidines by replacing one of the amino H atoms by an acyl radical, *e g*, $MeC_6H_4NHCOMe$, acetotoluidide

toluidine C_7H_9N = 107 12 Aminotoluene, $Me\ C_6H_4\ NH_2$ *ortho-* Colorless liquid, d 1 003, b 198 *meta-* Colorless liquid, d 0 989, b 203 *para-* Colorless leaflets, m 43, b 200, slightly soluble in water, soluble in alcohol or ether, used extensively in the synthesis of dyes and medicines **acetyl-** Acetotoluide **diethyl-** q v **methyl-** Xylidine **nitro-** q v **thionyl-** q v

t blue $C_{15}H_{16}N_2SCl\ ZnCl_2$ A double salt of zinc chloride and dimethyltoluthionine



A dark green powder with a blue luster, soluble in water, used technically in dyeing textiles Cf *methylene blue*, *thiazine dyes*, *thionine* **t hydrochloride** $C_7H_9N\ HCl$ = 143 6 Pale red crystals, soluble in water or alcohol **t sulfate** $C_7H_9N\ H_2SO_4$ = 205 1 Yellowish crystals, soluble in water or alcohol

toluido The monovalent radical MeC_6H_4NH— derived from toluidine

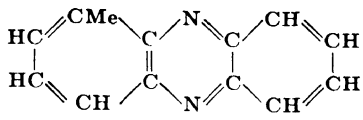
toluino Toluido

tolunitrile Cyano*toluene* **α-** Benzylcyanide

toluol Commercial toluene

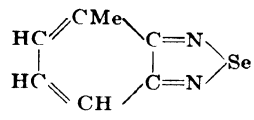
toluoyl Toluyl

toluphenazine $C_{13}H_{10}N_2$ = 194 1 The heterocyclic compound,



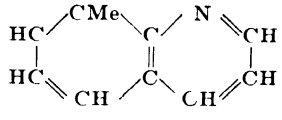
Colorless crystals, m 117 **dimethyldiamino-** Neutral red

tolupiaselenole $C_7H_6N_2Se$ = 197 2 The heterocyclic compound,

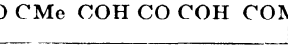


Colorless crystals, m 73, b 267

toluquinoline $C_{10}H_9N$ = 143 1 The heterocyclic compound,



toluquinone $C_7H_6O_2$ = 122 08 The solid, $MeC_6H_3O_2$, m 67 (sublimes), soluble in alcohol or ether, insoluble in water **methoxydihydroxy-** $C_8H_8O_5$ = 184 0

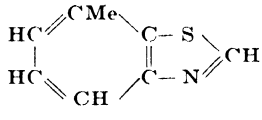


A pigment produced from glucose by the fungus *Penicillium spinulosum*

toluresitannol $C_{16}H_{14}O_3OCH_3OH$ A constituent of tolu balsam

tolurin Vitamin B_1

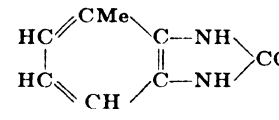
tolythiazole C_8H_7NS = 149 1 The heterocyclic compound,



toluyl Toluoyl The monovalent radical, C_7H_7CO— or MeC_6H_4CO— (methylbenzoyl) Three isomers o-, m-, p- **alpha-** The monovalent radical, $PhCH_2CO$—

t aldehyde C_8H_8O = 120 10 MeC_6H_4CHO *ortho-* A liquid, b 200 *meta-* A liquid b 199 *para-* A liquid, b 204 **t azo-β-naphthol** Scarlet R

toluylene (1) Tolylene, cresylene (6 isomers) The bivalent radical, $CH_3C_6H_3$=, derived from toluene (2) Stilbene **t blue** An oxidation-reduction indicator, q v **t diamine** $C_7H_{10}N_2$ = 122 1 The diamine, $CH_3C_6H_3(NH_2)_2$ **2 4-** Asymmetric diaminotoluene Colorless needles, m 99, b 280, soluble in water, alcohol or ether **2 3-** Colorless scales, m 61, b 255, soluble in water, used in organic synthesis **2 5-** m 64, b 273 **2 6-** m 104 **t diamine indophenol** An oxidation-reduction indicator, q v **t red** Neutral red **t hydrate** Stilbene hydrate **t urea** $C_8H_8N_2O$ = 148 1 The heterocyclic compound,



Colorless crystals m 290

tolyantipyrine Tolypyrine

tolyl (1) The monovalent radical, $CH_3C_6H_4$—, or C_7H_7— derived from toluene, three isomers o-, m-, and p- **alpha-** Benzyl

t acetic acid $C_9H_{10}O_2$ = 150 1 The monobasic acid, $CH_3C_6H_4CH_2COOH$ *ortho-* Colorless needles, m 88, soluble in water *para-* Colorless needles, m 91, b 266, slightly soluble in water **t alcohol** T carbinol **t bromide** Bromo*toluene* **t carbinol** $C_8H_{10}O$ = 122 1 The monatomic alcohol, $CH_3C_6H_4CH_2OH$ *ortho-* Colorless needles, d 1 023, m 34, b 223, soluble in water, alcohol or ether *meta-* A colorless liquid, d 1 036, m −20, b 217, soluble in water or alcohol *para-* Colorless needles, m 59, b 217, soluble in water, alcohol or ether **t chloride** (1) Chloro*toluene* (2) C_8H_9Cl Xylyl chloride **t hydrazine** $C_7H_{10}N_2$ = 122 08 Hydrazomethylbenzene $CH_3C_6H_4NHNH_2$ *ortho-* Colorless leaflets, m 56, soluble in water, alcohol or ether *meta-* A liquid, b 245 *para-* Colorless tablets, m 65, b 240, soluble in water, alcohol or benzene **t hydrochloride** $C_7H_{10}N_2$ HCl H_2O = 176 57 The hydrochloride of tolyhydrazine *ortho-* Reddish crystals, soluble in water or alcohol *para-* A brown powder, soluble in water or alcohol, used in organic synthesis **t hydroxylamine** C_7H_9ON = 123 1 $CH_3C_6H_4NHOH$ *ortho-* Colorless leaflets, m 94, soluble in water, alcohol or ether, used in organic synthesis **t mercuric chloride** C_7H_7HgCl = 327 12 Rhombic crystals, m 233, insoluble in water **t mustard oil** C_8H_7NS = 149 2 Thiocyanomethyl-benzene, $CH_3C_6H_4NCS$ *ortho-* A yellowish liquid, b 238, insoluble in water, soluble in alcohol or ether *para-* Colorless crystals, m -26, b 242, insoluble in water, soluble in alcohol or ether **t phenylketone** Phenyltolylketone

tolylene The bivalent radical, —$C_6H_4CH_2$—, which occurs in six isomers **alpha-** Benzal Cf *toluylene*

t diamine $C_7H_{10}N_2$ = 122 09 A group of isomeric compounds, as methylphenylene diamine, NH_2CH_2\ /NH_2 C_6H_4, or diaminotoluene, $Me\,C_6H_3(NH_2)_2$

tolypyrine $C_{12}H_{14}ON_2$ = 202 2 Tolyantipyrine, p-tolyldimethylpyrazole, $MeC_6H_4N(NMe\text{-}CMe\ CH\ CO)$ Colorless crystals, m 136, soluble in water or alcohol, insoluble in ether Used medicinally as an antipyretic **t salicylate** Tolysal

tolysal $C_{12}H_{14}ON_2$ = 202 2 Tolypyrine salicylate, $CH_3C_6H_4N(CO\ CH)NMe\ CMe$ Small colorless crystals, m 101, insoluble in water, soluble in alcohol Used medicinally as an antipyretic

tombak Any copper and zinc alloy

ton Unit of weight 1 short ton = 2000 pounds = 907 18486 kg (In common use in U S) 1 long ton = 2240 pounds = 1016 047 kg (In common use in Britain) 1 metric ton (tonne) = 0 9842 long tons = 1 1023 short tons = 1000 kg (in use in Continental Europe and non-English-speaking World) **assay-** See *assay*

refrigeration- The quantity of heat required to melt 2000 pds of pure solid ice into water at 32°F, it equals 288,000 B Th U

onalite A group of quartz, orthoclase and feldspathic rocks

onga A mixture of the barks of *Rhaphidophora vitiensis* (Araceae) and *Premma taitensis*, (Verbenaceae) from the Pacific Islands It contains tongine and an essential oil, is used as fluid extract for neuralgia Cf *tonka*

ongine An alkaloid from tonga

ongs A laboratory appliance for holding hot objects, such as crucibles, test-tubes or flasks

Tongs

onic An agent that increases vitality or restores vigor as, iron, arsenic or gentian

onite An explosive prepared from wet gun-cotton pulp (54 %) and barium nitrate (46 %)

onka Tonka bean, snuff bean The dried seeds of *Coumarouna odorata* or *Dipteryx odorata*, a Leguminosae tree of Northern Brazil and Guiana It contains coumarin and is used medicinally, as the fluid extract, as a cardiac stimulant, as an ingredient of perfumery and flavoring extracts, and in the manufacture of coumarin Cf *tonga*

:onne Metric ton

:onquinol $C_{11}H_{13}O_6N_3$ = 283 13 A colorless crystalline powder, used in perfumery as a substitute for musk

:oot poison Tutin

:opaz $Al_2SiO_4F_2$ A native aluminum fluosilicate representative of a group of silica minerals (q v), and occurring in colorless or variously colored crystals The transparent yellow variety is used as a precious stone **false-** Quartz **oriental-** Corundum

opazolite A yellow variety of iron garnet, q v

:opochemical (1) Referring to localized reactions which take place in the inner or outer fields of force of crystalline matter, as, ageing processes, or the building of crystals on a limited surface due to local supersaturation (2) Reactions occurring in zones

opochemistry The study of localized reactions, as in colloidal systems Cf *zone, protoplasm*

oramin The ammonium salt of trichlorbutyl-malonate, used medicinally as a substitute for opium

orbanite A variety of cannel coal (q v), having a high ash

orbernite A hydrated copper, uranium phosphate Cf *chalcophyllite*

ori seed oil Mustard seed oil

:ormentil Tormentilla, septfoil The dried rhizome of *Potentilla tormentilla*, a Rosaceae of Europe and Northern Asia It contains a red coloring matter, tormentil tannic acid, and quinovic acid, used for tanning leather and medicinally, as an astringent Cf *five-finger glass* **t tannic acid** $C_{26}H_{22}O_{11}$ = 510 2 A constituent of tormentil, an amorphous red brown powder, used in tanning

ornesite A chlorinated rubber product White powder, turning brown at 150°C , and resistant to common solvents and reagents

torque The force of or resistance to a twisting motion

Torricelli, Evangelista 1608–1647 An Italian inventor, assistant of Galilei noted for construction of barometers, microscope and telescope

torsion The act of producing a strain by twisting or rotating at right angles to the length of a material

torula Mycoderma A variety of yeast (fungi imperfecti) having a chain-like cell formation, in milk and beer

torulin Vitamin B_1

tosyl Abbreviation for the p-toluene sulfonyl radical

totaquina An anti-malarial evolved by the Malaria Commission of the League of Nations, which contains at least 75 % of crystallisable cinchona bark alkaloids, including at least 15 % quinine It is equal in efficiency to, but much cheaper than quinine

touch The sense of feeling **hard-** A t like that of crystals of inorganic salts **soft-** A t like that of phthalic anhydride or bees-wax **slippery-** The effect produced by alkali hydroxides **unctuous-** A fatty feel due to substances such as soapstone or ointments

touchstone (1) Jasper (2) A hard black stone on which a streak is made with a gold alloy It is treated with hydrochloric and nitric acids and water in succession, and the resultant streak compared with a standard streak gives an approximate value of the alloy Cf *streak test*

Toulet's solution A concentrated solution of mercury potassium iodide, d 3 17, used for the separation of minerals

tourmaline Brazilian sapphire, schorl, rubellite A group of aluminum silicates in various colors containing boron and lithium (Cf *silica minerals*) The red, blue, green and colorless t are used as gems Tourmalines are mixtures of aluminum borate with alkali, magnesium or iron silicates and frequently contain chromium, manganese, calcium and fluorine They are doubly refractive and are used in optical instruments (polariscopes) See *aphrizite, achroite, indicolite* **artificial-** Herapathite

tower A tall structure used for absorption, scrubbing, cooling or distilling

towsagis Mountain gum A Russian plant used for making rubber

toxalbumin A poisonous albumin *e g* , in cobra venom Cf *sozalbumin*

toxamins A group of substances of unknown chemical composition that exist in minute quantities in different foods and are harmful to well-being Antonym *vitamins*

toxemia Blood-poisoning, or poisoning caused by substances produced by body-cells or microorganisms

toxic Poisonous or pertaining to poisons **t dose** A dose that produces the characteristic symptoms of poisoning **t equivalent** The smallest amount of a substance required to kill an animal, divided by the weight of the animal

toxicarol (1) $C_{23}H_{22}O_7$ = 410 19 Yellow crystals optically-inactive m 219, from the roots of *Tephrosia (Cracca) toxicaria*, of South America, used as a fish poison (2) A second, unnamed principle $C_{23}H_{22}O_6$ = 394 19 Greenish crystals, m 171, occurring also in derris (q v) and cube, q v Cf *rotenone*

toxicity The degree of being poisonous, the ratio between the smallest amount that will cause the

death of an animal and the weight of the animal (toxic equivalent)

toxicodendrol A poisonous liquid from toxicodendron

toxicodendron The dried poisonous leaves of *Rhus toxicodendron* (see *rhus*)

toxicology A branch of science that deals with the actions, detection and treatment of poisons and poisonings

toxigenes Chemical products which, when injected into an animal, are not poisonous until modified by the vital activity of the cells, as ptomaines Cf *toxins*

toxin(e) The soluble substances produced during bacterial growth that stimulate the formation of antitoxins (cf *toxigenes*) **t formation** , The production of poisonous substances from proteins of the living body by the action of bacteria (1) *Phytotoxins* or *vegetable* toxins, such as abrin, crotin ricin and pollen (2) *Zootoxins* or *animal* toxins, as t of the toad, spider snake, scorpion or bee (3) *Bacteriatoxins* or toxins proper as, t produced by diphtheria, tetanus, botulism cholera or coli bacteria **t immunity** The production in the living body of antitoxins that counteract the effects of vegetable or animal toxins (See *Ehrlich side-chain theory*)

toxiphore Toxophore

toxisterol A sterol produced by irradiation of calciferol

toxoid A toxin that has been deprived of its poisonous toxophore (See *Ehrlich side-chain theory*) It is a degenerated toxin chemically modified so as to produce immunity, but not disease

toxone A toxin made less poisonous by partial combination with an antitoxin, a mixture of toxins with neutralized toxins (*toxoids*)

toxophore The poisonous radical in a toxin molecule that reacts with the living protoplasm and forms a stable compound (*paraplasm*) Cf *constellation*

trace A very small quantity of a substance usually when present in a concentration of less than 5γ per gm

tracer A mixture of calcium resinate with magnesium rare earth nitrates and glue, used in projectiles to make their path visible **t element** A radioactive indicator, q v

tracheid Fiber An elongated cell from woody plants, containing varying amounts of lignin and characterised by bordered pits or discoid markings which vary according to its origin

track The path described by a particle (*e g* , as α-, β-rays, or protons, electrons, ions or molecules) made visible in a cloud chamber Cf *Wilson tracks, Brownian movement*

tractive force The power of pulling or drawing, as, of a magnet

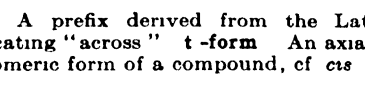
tragacanth Gum dragon The gummy exudation from the stems of *Astragalus gummifer* and other Astragalae species of the Leguminosae family native to Asia Minor It contains bassorin, pectin and starch, used as an emulsifier and adhesive in pharmacy, the textile industry and by cigar makers Cf *bandoline xylan-bassoric acid* **Indian-** Sterculia gum

tragacanthin Vegetable mucus The carbohydrate of tragacanth, a polysaccharide hydrolyzing to pentosans

tragon Locust kernel gum from carob beans

train A connected arrangement of several chemical instruments, as, the combustion train in organic analysis

trans- A prefix derived from the Latin and indicating "across" **t -form** An axially-stereoisomeric form of a compound, cf *cis*



trans-form *cis*-form

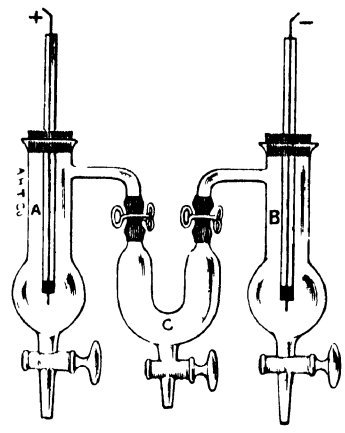
transamination The reversible transference of amino groups by enzymes (transaminase, aminopherases, q v) into ammodical boxylic acids and keto-acids

transaudient Permitting sound waves to pass through

transcalent Permitting heat waves to pass through

transcrystallization The formation of crystals so that their principal axes are perpendicular to the direction of flow of heat

transfer The conveyance of matter or energy from one location to an other **t number** Transport number **t pipet** A pipet that measures one definite volume of liquid It has only one graduation mark and differs from measuring pipets, which have many graduations



Transference cell

transference Transfer **t cell** Hittorf cell An electrolytic cell with a detachable center portion, used to determine the change of concentration of an electrolyte during electrolysis **t numbers** Transport numbers

transformation A change in form, structure or internal arrangement of atoms Cf *nuclear reaction radio-elements* **radioactive-** See *radioactivity*

t constant The fraction of radioactive material that disintegrates each second **t series** See *radioactive* disintegration **t theory** Electromagnetic radiations have corpuscular aspects (*e g* , Compton effect, light pressure), and the motion of matter has undulatory aspects (*e g* , electron scattering, where $\lambda = h/mv$) Cf *Planck's constant, mass-energy cycle, quantum*

transformer A device for changing the electric potential or nature of an electric current, as, *step-down* transformer (higher to a lower potential) and *step-up* transformer (lower to a higher potential) It may also change the phase of the current, or convert it from alternating to direct, or the reverse Cf *rectifier*

transition A change from one state or form to another state or form, as, melting, boiling or a

change from one to another crystalline, allotropic or enantiomorphic form **t elements** The three trios of elements in the periodic table which are grouped together, and connect the odd series 4, 6, and 8 with the following even series, viz (*A*) Fe, Co, Ni, (*B*) Ru, Rh, Pd, (*C*) Os, Ir, Pt **t interval** The pH range over which the color change of an indicator takes place Cf *pT* **t point** The temperature at which a transition occurs

translucent Semi-transparent, permitting the partial passage of light Cf *radiolucent, opaque, transparent*

transmissibility The capacity of a substance to allow the passage of light, the absorption by it of light of certain wave-lengths It may be qualitative (color-screens) or quantitative (translucence)

transmutation (1) A change of one element into another element, as, in radioactive disintegration or in alchemical notions In the latter case transmutation always indicated a change from a base to a noble metal (gold) Cf *atom building* (2) Artificial A change from one element into another by bombardment with fast-moving protons, deutons or alpha-particles, q v Cf *radioelements, nuclear reactions, proton bombardment, neutron*

transparency The property of permitting the passage of rays of radiations, *e g*

glass—transparent to visible light,
rock-salt—transparent to heat, visible, and ultra-violet rays,
white fluorite—transparent to infra-red, visible, and ultra-violet rays,
paraffin—transparent to Hertzian rays,
thin metals—transparent to gamma rays (Al to x-rays, Ag to ultra-violet rays, etc)

Antonym *opacity*

transparent Describing a substance through which one can see, or which permits the passage of rays of the visible spectrum Antonym opaque Cf *radiopaque, translucent*

transpiration The exhalation of water vapor by a plant or animal through its surface tissue or skin Cf *respiration*

transport number Transference number, Hittorf number (n) The relative migration-velocities of the anion and cation of an electrolyte If u and v are the migration velocities of the anion and cation, respectively, then the corresponding transport numbers are

$$n(\text{anion}) = v/(u + v),$$
$$(1 - n)(\text{cation}) = u/(u + v)$$

During electrolysis the ratio of the fall in concentration round the anode to that round the cathode is $n/(1 - n)$

transposition An atomic displacement within a molecule by which one atom changes place with another atom of the same molecule

transudate Liquid which has passed through a living tissue Cf *osmosis*

transuranium The elements, unknown so far, of atomic weights higher than that of uranium It is calculated that 98 % of the universe consists of these elements, and that the known elements of our earth and those found by spectrum analysis constitute only 2 % They are supposed to exist in the interior of stars Cf *hypon* By bombardment of uranium, ekarhenium and ekaosmium, (q v) have been synthesized (1935)

trapezeum A plane figure bounded by four straight lines, no two of which are parallel

trapezohedron A crystal of six, eight, or twelve faces, having unequal intercepts on all the axes

trapezoid A plane figure bounded by four straight lines, one pair of which are parallel

trass A natural pozzolana, q v

Traube J 1860– A German chemist noted for work in colloids and capillary phenomena **T stalagmometer** A stalagmometer (q v) for determination of the surface tension of fluids, used in biochemical investigations **T 's rule** The adsorption of organic substances from aqueous solutions increases strongly and regularly in a homologous series with an increasing number of carbon atoms

traumatol C_7H_7OI = 234 3 Iodocresol, iodocresine $CH_3C_6H_3I\,OH$ A purplish-red powder, used as an iodoform substitute

traversal The path of a particle made visible by a track, q v

traversellite Augite which contains Al_2O_3

travertine $CaCO_3$ Calcareous sinter, onyx A native calcium carbonate, usually banded similarly to marble Cf *tufa*

treacle Molasses

Treadwell, Frederick P 1857–1918 An English chemist, noted for analytical methods

treble Triple

trehalase An enzyme of fungi that hydrolyses trehalose

trehalose $C_{12}H_{22}O_{11}$ = 342 2 A disaccharide from manna, yeast, mushrooms (trehala) and ergot White crystals, m 210, $[\alpha]_D$ + 197° It hydrolyzes to glucose and is used to differentiate paratyphoid bacteria Cf *mycose*

treibgas Calorgas

tremolite $3MgO,SiO_2,CaSiO_3$ A white or green native amphibole, a silica mineral, q v

trephone Secretions from leucocytes which stimulate tissue repair in the healing of wounds

trester The residue remaining after pressing grapes **t fermentation** The fermentation of diluted grape-residues, with or without addition of sugars

tri- A prefix derived from the Latin indicating "three" See *ter-*

triacetamide $N(C_2H_3O)_3$ = 143 11 A solid, m 78, soluble in ether

triacetate A compound whose molecule contains three acetate radicals, $(CH_3COO—)_3$

triacetin $C_9H_{14}O_6$ = 218 2 Glyceryltriacetate, $(MeCOO)_3C_3H_5$ An oily liquid from cod-liver oil, butter and other fats, d 1 161, b 258, slightly soluble in water soluble in alcohol or ether Cf *acetin*

triacetonediamine $C_9H_{20}N_2O$ = 172 2 *2 6*-Diamino-*2 6*-dimethylheptanone-4, bis (*2*-aminoisobutyl) ketone, $(NH_2CMe_2\,CH_2)_2CO$ A reaction-product of ammonia and acetone

triacontane $C_{30}H_{62}$ = 422 5 A solid hydrocarbon isolated from the roots of *Oenanthe crocata*, an umbelliferous plant, m 66

triad (1) A group of three related elements or compounds, as, the triad Cl, Br, and I, or a group of three tautomeric compounds (2) A trivalent atom or radical (3) In crystallography, a crystal which shows 3 similar faces as it is rotated about its axis of symmetry through 360°

triallylamine $C_9H_{15}N$ = 137 1 The tertiary amine, $N(C_3H_5)_3$ A colorless, oily liquid

triamido Triamine

triamine A compound of the type, $R(NH_2)_3$ It differs from the tertiary amine, NR_3

triaminoazobenzene $C_{12}H_{13}N_5$ = 227 2 Aniline brown, Manchester brown, Vesuvin, Bismarck brown, $NH_2C_6H_4N{:}NC_6H_3(NH_2)_2$ A red or dark brown powder, m 143, soluble in water, alcohol or ether Used as dye for leather, cotton or wool, as a bacteriological stain, and for determining the decolorizing power of charcoal

triaminobenzene $C_6H_9N_3$ = 123 1 $C_6H_3(NH_2)_3$ **1 2 3-** m 103, b 330 **1 2 4-** m below 100, b 340 Both are very soluble in water, alcohol or ether

triamorph A substance that crystallizes into three different types of crystals, described as trimorphous

triamylamine $C_{15}H_{33}N$ = 227 1 $N(C_5H_{11})_3$ A white solid, used as an antioxidant, solvent, in the rubber industry and for flotation

triangle A plane figure, bounded by three straight lines, pairs of which meet at three points **reference-** See *diagram*

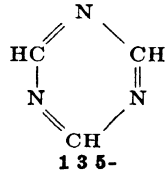
triatomic Describing (1) A molecule that consists of three atoms (2) An acid that has three replaceable hydrogen atoms (3) A base, alcohol or phenol that has three hydroxyl groups

triazane (1) Hydrazoamino The monovalent radical —NH NH NH_2 (2) Prozane, NH_2-NH NH_2 in which the H is replaceable by hydrocarbon radicals Cf *hydronitrogen*

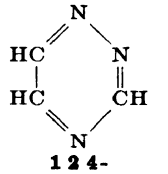
triazene (1) The monovalent radical —NH N-NR (2) Diazoamine, NH_2,N NH, in which the H is replaceable by hydrocarbon radicals Cf *hydronitrogen*

triazeno The monovalent radical, NH_2N N—

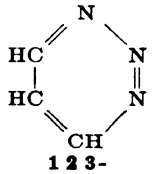
triazine $C_3H_3N_3$ = 81 03 The heterocyclic compounds,



1 3 5- s(ymmetric)- (kyanidine)



1 2 4- a(symmetric)-



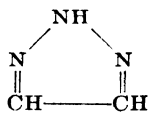
1 2 3- v(icinal)-

t triol Cyanuric acid

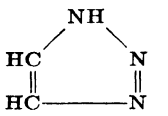
triazinyl The monovalent radical, $C_3H_2N_3$—, derived from triazine

triazo Azide Trinitride The monovalent group —N **t benzene** Phenyl azide

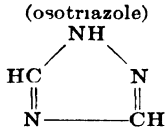
triazole $C_2H_3N_3$ = 69 06 Pyrrodiazole The heterocyclic compounds,



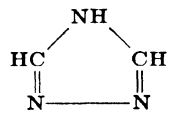
1 2 5- (osotriazole)



1 2 3- v(icinal)

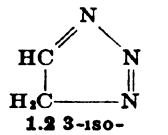


1 2 4- a(symmetric)-

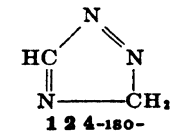


1 3 4- s(ymmetric)-

1 2 4- Common triazole pyrro-[ab'']-diazole Colorless needles, m 120, b 260, soluble in water or alcohol **benzo-** See *benzotriazole* **diphenyl-** See *diphenyltriazole* **iso-**

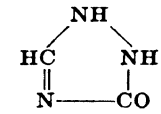


1.2 3-iso-



1 2 4-iso-

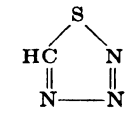
triazolone $C_2H_3ON_3$ = 85 1 Ketotriazole The heterocyclic compound,



1-phenyl-	m 183
1-phenyl-5-methyl-	m 167, b 300
1-phenyl-5-ethyl-	m 192

triazolyl The monovalent radical, $C_2H_2N_3$—, derived from triazole

triazsulfole CHN_3S = 87 11 Thio [a,b,b'] triazole The heterocyclic compound,



E g, 5-ethylamido-, $Et_2N(CN_3S)$, m 67, 5-allylamido-, $C_3H_5N(CN_3S)$, m 54

tribasic Describing a molecule that has three replaceable hydrogen atoms, or produces three hydrogen ions in solution

tribenzal Indicating 3 benzal radicals, Ph CH=

tribenzo-p-diazine Naphthophenazine

tribenzoylmethane $C_{22}H_{16}O_3$ = 328 24 $(PhCO)_3CH$ Colorless crystals, m 225 (sublime), soluble in water, alcohol or ether

tribenzyl Indicating the presence of 3 benzyl radicals, Ph CH_2— **t amine** $C_{21}H_{21}N$ = 287 28 The solid, $N(C_6H_5CH_2)_3$, m 91, soluble in water or ether, slightly soluble in alcohol **t ethyl tin** $EtSn(CH_2Ph)_3$ = 420 90 White crystals, m 31, soluble in organic solvents **t tin chloride** $(PhCH_2)_3SnCl$ = 427 32 White needles, m 142, insoluble in water **t tin hydroxide** $(PhCH_2)_3SnOH$ = 408 87 Rhombic crystals, m 120, soluble in organic solvents

tribenzylidene diamide Hydrobenzamide

tribo- A prefix derived from the Greek, indicating "friction" or "rubbing"

triboelectric series An arrangement of substances in a list so that any substance, when rubbed by a substance following it in the list, becomes positively electrified (+) asbestos, hair (rabbit s fur), glass, wool, calcite, silk, cotton, magnalium, wood, amber, slate, ebonite, sulfur, celluloid, rubber, (—) Cf *electromotive series*

triboluminescence The phenomenon shown by substances, especially crystals, of emitting light when crushed, rubbed, or mechanically pressed together Cf *luminescence*

tribromide A binary compound that contains three bromine atoms in the molecule

tribromo-, tribrom- A prefix indicating that a compound contains three bromine atoms in its molecule **t acetaldehyde** Bromal **t acetic acid** $C_2HO_2Br_3$ = 296 78 CBr_3COOH Colorless leaflets, m 135, decomp 250, soluble in water, alcohol or ether Used in organic

synthesis **t aniline** $C_6H_4NBr_3$ = 329 83 Aniline-tribromide, 1-amino-2 4 6-tribromo-benzene, $NH_2C_6H_2Br_3$ Small needles, m 119, b 300, insoluble in water, soluble in alcohol or ether, used medicinally for neuralgia **t benzene** $C_6H_3Br_3$ = 314 8 Symmetrical, or **1 3 5-**tribrombenzene Colorless needles, m 119, b 278, insoluble in water, slightly soluble in alcohol **1 2 3-** m 87, **1 3 4-** m 44, b 275 **t ethane** $C_2H_3Br_3$ = 266 77 **1 1 2-** or β- $BrCH_2CHBr_2$ A liquid, d 2 579, m −26, b 188 **t ethanol** Avertine **t ethylene** C_2HBr_3 = 264 76 BrCH CBr_2 A liquid, d 2 708, b 164 **t hydrine** Allyltribromide **t methane** Bromoform **t -β-naphthol** $C_{10}H_4Br_3OH$ = 380 9 A gray crystalline powder, soluble in alcohol or ether, used medicinally as a disinfectant **t phenol** $C_6H_3Br_3O$ = 330 8 (2 4 6-) Bromol Soft, white, colorless needles, m 92 (sublime), slightly soluble in water, soluble in alcohol, ether or benzene Used as a disinfectant and antiseptic **t phenol bismuth** Xeroform **t phenyl salicylate** Cordol **t resorcinol** $C_6H(OH)_2Br_3$ = 346 81 Colorless needles, m 112, slightly soluble in water, soluble in alcohol or ether **t salol** $C_{13}H_7O_3Br_3$ = 450 7 Cordol, tribromphenylsalicylate, $C_6H_4OHCOOC_6H_2Br_3$ Colorless crystals slightly soluble in water, used medicinally as an antiseptic

tributylamine $C_{12}H_{27}N$ = 185 3 The tertiary amine, NBu_3 A colorless liquid, d 0 778, m −71, b 216, insoluble in water, soluble in alcohol or ether **iso-** $N(CH_2CHMe_2)_3$ A colorless liquid, d 0 766, m −22, b 191

tributyrin Butyrin

tricalcium phosphate See *calcium phosphate*

tricaprin $C_{33}H_{68}O_6$ = 560 48 Glyceryl tricaprinate $(C_9H_{21}COO)_3C_3H_5$ Triclinic crystals, d 0 921, m 31, insoluble in water

tricaproin $C_{21}H_{38}O_6$ = 386 27 Glyceryl tricapronate, $(C_5H_{11}COO)_3C_3H_5$ A colorless liquid, d 0 988, m −25, insoluble in water

tricaprylin $C_{27}H_{50}O_6$ = 470 39 Glyceryl tricaprylate, $(C_7H_{15}COO)_3C_3H_5$ Colorless liquid, d 0 954, m 8, insoluble in water

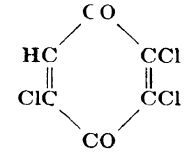
tricarballylic acid $C_6H_8O_6$ = 176 1 Propane tricarboxylic acid, CH_2COOH $CHCOOH$ CH_2COOH Colorless rhombic crystals, in beet molasses, m 166, decomp by further heat, soluble in water, alcohol or ether **β-hydroxy-** Citric acid

tricetin $C_{15}H_{10}O_7$ = 302 1 *5 7 3′ 4′ 5′*-Pentahydroflavone A pigment from wheat

trichinae A race of food parasites

trichloride Terchloride A binary compound that contains three chlorine atoms in its molecule

trichloro-, trichlor- A prefix indicating that a compound contains three chlorine atoms in its molecule **t acetal** $C_6H_{11}O_2Cl_3$ = 221 5 $(EtO)_2CH$ CCl_3 (1) A colorless liquid, d 1 288, b 197 soluble in water, alcohol or ether (2) A solid, m 83, b 230 **t acetamide** $C_2H_2ONCl_3$ = 162 4 CCl_3CONH_2 Colorless leaflets m 141, b 239, insoluble in water, soluble in alcohol or ether **t acetic acid** $C_2HO_2Cl_3$ = 163 4 CCl_3COOH Colorless rhombic crystals, $d_{60°}$ 1 630, m 57, b 195, soluble in water, alcohol or ether Used as a reagent, as a general test for unsaturated compounds and also in organic synthesis **t acetylchloride** C_2OCl_4 = 181 8 CCl_3COCl A colorless liquid, b 118, soluble in alcohol, used in organic synthesis **t aldehyde** Chloral **t benzenes** $C_2H_3Cl_3$ = 181 43 Colorless solids or liquids, insoluble in water, soluble in alcohol or ether **1 3 5 -** (asymmetric) m 63, b 209, **1 2 4 -** $d_{10°}$ (liq) 1 466, m 17, b 213 **1 2 3 -** m 52, b 219, $d_{10°}$ (solid) 1 574 **t butylalcohol** Chloretone **t butylaldehyde** Butylchloral **t butylmalonate** Toramin **t ethane** $C_2H_3Cl_3$ = 133 41 *alpha-* Methylchloroform, $MeCCl_3$ A colorless liquid, d 1 325, b 75, insoluble in water, soluble in alcohol or ether, used medicinally as an anesthetic *beta-* $CHCl_2CH_2Cl$ A colorless liquid, d 1 478, b 114, insoluble in water, soluble in alcohol or ether **t ethanol** $C_2H_3Cl_3O$ = 149 4 Trichlorethylalcohol, CCl_3CH_2OH Colorless rhombic tablets, m 18 b 151, slightly soluble in water, soluble in alcohol or ether **t ethylalcohol** Trichlorethanol **t ethylene** C_2HCl_3 = 131 4 1-chloro-2-dichloroethylene $CHCl$ CCl_2 A colorless liquid, d 1 459, m −70, b 87, insoluble in water, soluble in alcohol or ether Used in organic synthesis, dry cleaning and degreasing, as a refrigerant, in the manufacture of perfumes, paints and varnishes for the extraction of fats, caffeine and nicotine, and as an inhalation anesthetic, particularly for angina pectoris **t ethylurethane** Voluntal **t hydrin** $C_3H_5Cl_3$ = 147 4 Allyltrichloride trichloropropane glycerylchloride, glyceryltrichlorohydrin CH_2Cl $CHCl$ CH_2Cl A colorless liquid, d 1 417, b 158, insoluble in water, used medicinally as a hypnotic and anesthetic **t hydroquinone** $C_6H_3O_2Cl_3$ = 213 4 $C_6H(OH)_2Cl_3$ Colorless prismatic crystals, m 134, soluble in water, alcohol or ether **t lactic acid** $C_3H_3O_3Cl_3$ = 193 42 $CCl_3CHOHCOOH$, m 116, and soluble in water, alcohol and ether **t methane** Chloroform **t methylchloroformate** $C_2O_2Cl_4$ = 197 8 Diphosgene $ClCOOCl$ A colorless liquid, b 127 A lung-irritant poison gas **t phenol** $C_6H_3OCl_3$ = 197 43 $C_6H_2(OH)Cl_3$, 1-Hydroxy-2 4 6-trichlorbenzene Colorless rhombic crystals, m 68, b 244 soluble in water, alcohol or ether, used medicinally as an antiseptic and disinfectant **1 2 3 5-** m 53, b 252 Slightly soluble in water, very soluble in alcohol or ether **t propane** Trichlorohydrin **t quinone** $C_6HO_2Cl_3$ = 211 5



Yellow leaflets, m 165, insoluble in water, soluble in alcohol or ether **t toluene** Benzotrichloride **t triethylamine** $N(C_2H_4Cl)_3$ = 204 5 An irritating liquid, causing blisters

trichodesmine $C_{18}H_{27}NO_6$ = 353 2 An alkaloid, m 202 (decomp), from *Trichodesma incanum*, a Boraginaceae

trichroism A phenomenon shown by certain minerals or crystals of having three different colors when viewed at different angles

trichromatic Three colors (q v) **t analysis** The matching of colors in terms of three primary components red, green and blue

tricin $C_{17}H_{14}O_7$ = 330 1 *5,7,4-*Trihydroxy-*3′ 5′*-dimethoxy flavone A dimethylether of tricetin, a pigment in the leaves of wheat,

especially the variety khopli, *Triticum dicoccum* Yellow needles, m 292, insoluble in water or benzene, soluble in alcohol, ether and acetic acid

triclene Trade name for trichloroethylene

triclinic Anorthic, asymmetric A crystal that has three unequal, long axes at oblique angles to one another See *crystal system, prisms, pyramids*

tricosane $C_{23}H_{48}$ = 324 37 The hydrocarbon, $Me(CH_2)_{21}Me$ A crystalline solid, d 0 779, m 47 7 b 320 7

tricosanoic acid See *cosanic acids*

tricosanol See *cosanols*

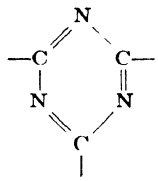
tricosoic acid A group of isomers, $C_{22}H_{45}COOH$ **n-** Tricosanoic acid

tricresol A mixture of *o-*, *m-*, and *p-* cresols

tricresyl Indicating the presence of 3 cresol radicals **t phosphate** $C_{21}H_{21}O_4P$ = 368 19 Lindol, tri-*p*-cresylphosphate, $(C_6H_4Me)_3PO_4$ Colorless odorless liquid, d 1 18, m exceeds −25 (if pure m 77°C), b exceeds 340, used as a plasticizer for lacquers, dopes, coating solutions, waterproofing paper and fabrics, and for softening resins and rubber It causes "ginger paralysis"

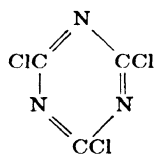
tricyanic acid Cyanuric acid

tricyano- Describing members of a group of compounds that contain, in their molecules, the ring,



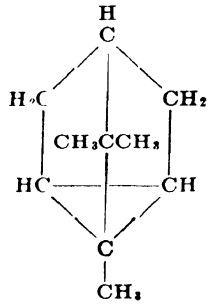
They are derived from cyanocompounds by polymerisation

tricyanogen chloride $C_3N_3Cl_3$ = 184 4 Cyanuric chloride The heterocyclic compound,



Colorless crystals, m 146, b 190, slightly soluble in water, soluble in alcohol or ether It is a polymer of cyanogen chloride

tricyclene $C_{10}H_{16}$ = 136 12 A tricyclic terpene



tricyclic Describing (1) A molecule that contains three rings of atoms, as, anthracene, diphenylbenzene (2) A ring of three atoms

tridecane $C_{13}H_{28}$ = 184 3 A saturated hydrocarbon of the methane series Colorless liquid, d 0 757, m −6, b 234, insoluble in water, soluble in alcohol or ether

tridecanoic acid $C_{13}H_{26}O_2$ = 214 20 Tridecylic acid, *n*-tridecoic acid, ficocerylic acids $C_{12}H_{25}COOH$, in figs and coconuts Colorless crystals, m 51, b $_{100mm}$236

tridecanol Tridecyl alcohol

tridecoic acid An isomer of $C_{12}H_{25}COOH$ **n-** Tridecanoic acid **cyclopentyl-** Chaulmoogric acid

tridecyl The monovalent radical, $C_{13}H_{27}$—, derived from tridecane **t alcohol** $C_{13}H_{28}O$ = 200 22 *n*-Tridecanol, $C_{13}H_{27}OH$ Crystals, d 0 822, m 30 5, b $_{15mm}$156 **t amine** $C_{13}H_{29}N$ = 199 23 *n*-Aminotridecane Crystals, m 27, b 265

tridecylene $C_{13}H_{26}$ = 182 3 An unsaturated hydrocarbon of the ethylene series A colorless liquid, d 0 845, b 233, insoluble in water, soluble in alcohol or ether

tridecylic acid Tridecoic acid

tridiphenylmethyl The 'free radical' compound, $(Ph\ C_6H_4)_3C$, occurring in colorless crystals that form a colored solution

tridymite SiO_2 A native, hexagonal, crystalline form of silica (quartz), d 2 26, stable below 1470°C It is also formed when quartz or cristabolite is heated at 870–1470°C, it has three crystalline forms

trieline Trichloromethylene

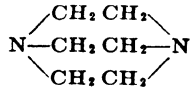
-triene Suffix indicating three double bonds

triethanolamine $C_6H_{15}NO_3$ = 149 12 $\beta\beta'\beta''$-Trihydroxytriethylamine, $N(C_2H_4OH)_3$ A colorless liquid, d $_{20°}$1 124, b $_{150mm}$227, soluble in water Used as a basis for soaps and the emulsification of oils waxes and paraffins, and as a reagent for antimony and tin

triethoxy Indicating 3 ethoxy radicals, EtO— **t boron** $B(OC_2H_5)_3$ = 145 94 A colorless liquid, d 0 864, b 120

triethyl- A prefix indicating the presence of three ethyl radicals in the compound **t amine** $C_6H_{15}N$ = 101 2 The tertiary amine, NEt_3 A colorless liquid, d 0 733, b 89, soluble in water, alcohol or ether It is a ptomaine in decaying fish **t arsine** $C_6H_{15}As$ = 162 1 $AsEt_3$ A colorless liquid, d 1 152, b$_{735mm}$ 140, soluble in alcohol **t benzene** $C_{12}H_{18}$ = 162 20 The hydrocarbon, $C_6H_3Et_3$ (1 3 5) A colorless liquid, d 0 864, b 218, insoluble in water, soluble in alcohol or ether **t bismuthine** $C_6H_{15}Bi$ = 296 12 Bismuth ethyl, $BiEt_3$ Colorless liquid d 1 82, b $_{79mm}$107, insoluble in water soluble in organic solvents **t boron** $C_6H_{15}B$ = 97 94 Boron ethyl, BEt_3 Colorless liquid, d 0 6961, b 95, insoluble in water **t carbinol** $C_7H_{16}O$ = 116 2 The tertiary alcohol, CEt_3OH A colorless liquid, d 0 84, b 141, soluble in water, alcohol or ether **t gallium** $C_6H_{15}Ga$ = 156 85 Gallium ethyl, $GaEt_3$ Colorless liquid d 1 0576, m −82 3, b 142 6, decomp by water **t phosphine** $C_6H_{15}P$ = 118 2 PEt_3 A colorless liquid, d 0 812 b 127, insoluble in water soluble in alcohol or ether Used as a reagent for carbon disulfide in illuminating gas **t phosphite** $(C_2H_5)_3PO_3$ = 166 2 A colorless liquid, b 155, insoluble in water, soluble in alcohol or ether **t silicoformate** $SiH(OEt)_3$ = 164 43

iethylenediamine $C_6H_{12}N_2$ = 112 15 Hexamethylenediamine The heterocyclic compound,



A liquid, b 210 **t glycol** $C_6H_{14}O_4$ = 150 1 $(CH_2OH\ CH_2\ O\ CH_2—)_2$ Colorless liquid, d 1 1125, b 276, soluble in water or benzene, used as solvent for nitrocellulose and in synthesis

iferrin Iron paranucleinate A reddish powder containing 22 % iron and 2 5 % phosphorus, insoluble in water, alcohol or ether Used medicinally as a hematinic

ifolium Red clover blossoms The dried flowers of *T pratense*, a Leguminosae, used medicinally, as the fluid extract, as an alterative

iformol Paraformaldehyde

ifructosan $C_{18}H_{30}O_{15}$ = 486 24 Secalose trifructose anhydride A white, crystalline, sweet-tasting trisaccharide from rye-flour, and used to detect its presence in other flours, insoluble in 70 % alcohol, soluble in acids

igalloyl Three galloyl radicals, $C_7H_5O_4$— or $C_6H_2(OH)_3CO$—, derived from gallic acid **t acetone glucose** $C_{30}H_{28}O_{18}$ = 676 2 Amorphous, light brown mass, soluble in water **t glucose** $C_{27}H_{24}O_{18}$ = 636 15 $(C_7H_5O_4)_3C_6H_9O_6$ Amorphous yellow mass, soluble in water **t glycerol** $C_{24}H_{20}O_{15}$ = 548 12 $(C_7H_5O_4)_3C_3H_5O_3$ Amorphous, brown mass, soluble in water, alcohol, ether or acetone Used as a tanning agent

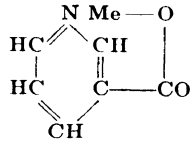
igemin $C_{18}H_{30}O_3N_3C_{15}$ = 424 6 Dimethylamidoantipyrinbutylchloralhydrate Long, white needles, m 85, used as an analgesic and a sedative

igger A substance which initiates a chain reaction, q v

iglyceride See *glyceride*

igonal Describing a crystal with two equal axes and one axis shorter or longer, all of them at right angles to one another See *crystal systems, prisms, pyramids*

igonelline $C_7H_7O_2N$ = 137 1 Nicotinic-methyl-betaine, the methylbetaine of nicotinic acid, in seeds of many plants, in sea urchin, *Arabacia pustulosa* and the Coelenterate, *Vella spirans*, jelly fish, and in urine, after taking nicotinic acid Colorless crystals, m 218 (cf *stachydrine*)



iguaiacyl Having three guaiacyl radicals, $C_7H_7O_2$— or MeO C_6H_4O— **t phosphate** $C_{21}H_{22}O_7P$ = 416 19 $(C_7H_7O_2)_3P\ OH$ White crystals, m 98, used as a plasticizer **t phosphite** $C_{21}H_{21}O_6P$ = 400 19 $(C_7H_7O_2)_3P$ White crystals, m 78, used as a plasticizer

ihemellitic acid Trimellitic acid

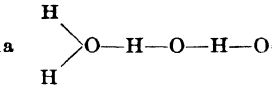
ihexosan A dextrin, isolated from beer by precipitation with alcohol

ihydrate A compound that contains three molecules of water of crystallisation

trihydric. Describing an alcohol with three hydroxy-groups

trihydrocyanic acid See *cyanidines*

trihydrol A threefold polymer of water, assumed to exist in solutions and to have the formula



Cf *dihydrol*

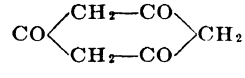
It is more abundant in cold than in hot water

trihydroxy- A prefix indicating the presence of three hydroxy groups **t anthraquinone** See *anthragallol, purpurin, anthrapurpurin, flavopurpurin* **t benzene 1 2 3-** Pyrogallol **1 2 4-** $C_6H_3(OH)_3$ = 126 1 Hydroxy hydroquinone White crystals m 141, very soluble in water, alcohol or ether **1 3 5-** Phloroglucinol **t benzoic acid** $C_7H_6O_5$ = 170 1 **2 3 4-** Pyrogallolcarboxylic acid, $C_6H_2(OH)_3COOH$ Colorless needles, d 4°1 69, m 110, decomp 200, soluble in water, alcohol or ether **3 4 5-** Gallic acid **t benzophenone** $C_{13}H_{10}O_4$ = 230 2, m 133 **t oestrin** Oestriol **t pyridine** $C_5H_5O_3N$ = 127 08 A solid, m 220–230 (decomp), soluble in water, insoluble in alcohol or ether **t stearic acid** $C_{17}H_{32}(OH)_3COOH$ = 332 0 A white solid, m 146, which acts as purgative

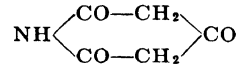
triiodide A binary compound that contains three iodine atoms in its molecule

triiodo-, triiod- A prefix indicating that a compound contains three iodine atoms in its molecule **t acetic acid** $C_2HO_2I_3$ = 437 8 CI_3COOH Yellow scales, m 150, soluble in water **t benzene** $C_6H_3I_3$ = 455 81 **1 2 3-** m 116 (sublime), **1 2 4-** m 91, **1 4 5-** m 183 **t cresol** (*meta-*) Losophan **t methane** Iodoform

triketo- A prefix indicating that a compound contains three =CO groups in its molecule **t hexamethylene** The keto-form of phloroglucinol,



t hydrindenhydrate Ninhydrin **t piperidine** $C_5H_5O_3N$ = 127 1 1 3 5-trioxypyridine The heterocyclic compound,



t purine Uric acid

triketones A group of organic compounds containing three ketone groups, as,

Me CO CO CO Me	pentanetrione
Me CO CH_2 CO CO Me	2 4 5-hexanetrione
Me CO CH_2 CO CH_2 CO Me	2 4 6-heptanetrione

trilaurin $C_{39}H_{74}O_6$ = 638 7 Glyceryl laurate, $C_3H_5(OOC\ C_{11}H_{23})_3$ A crystalline glyceride from palmnut oil, cocoanut oil and bayberry oil

trilinolein $C_{57}H_{96}O_6$ = 878 8 Glyceryl linolate, $C_3H_5(OOC\ C_{17}H_{30})_3$ A glyceride from linseed oil, sunflower oil or hempseed oil

trilite Trinitrotoluene

trillion (1) The number, 10^{18} (English and German usage = 1,000,000^3) (2) The number 10^{12} (American and French usage) = 1,000,000 × 1000^2)

trillium Beth-root, Indian balm, ground lily The dried rhizome of *T erectum*, a Liliacae, used medicinally, as the fluid extract, as a tonic and alterative

trimellitic acid $C_9H_6O_6$ = 210 1 Trihemellitic acid, 1 2 4-benzenetricarboxylic acid, $C_6H_3(COOH)_3$ Colorless crystals, m 216, soluble in water or alcohol

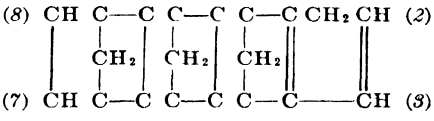
trimer A condensation-product of three molecules Cf *polymer, dimer*

trimeric Able to form three-fold polymers Cf *trimetric*

trimesic acid Trimesitinic acid

trimesitinic acid $C_9H_6O_6$ = 210 1 Trimesic acid, 1 3 5-benzene tricarboxylic acid, $C_6H_3(COOH)_3$ Colorless crystals, m 348, soluble in water, alcohol or ether

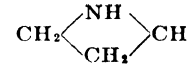
trimethano- A prefix indicating the presence of three —CH_2— bridges in a ring, as, **t cyclopentanthrene**



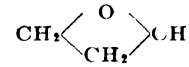
trimethoxy- A prefix indicating the presence of three methoxy groups, CH_3O— or MeO— **t boron** $C_3H_9O_3B$ = 103 69 Methylborate, $B(OMe)_3$ Colorless liquid, d 0 915, b 65

trimethyl- A prefix indicating that a compound contains three methyl groups in its molecule **t acetaldehyde** Pival aldehyde **t acetic acid** Pivalic acid **t acetone** $C_6H_{12}O$ = 100 1 The ketone, CMe_3COMe **t acetyl chloride** Pivalyl chloride **t amine** C_3H_9N = 59 1 Secaline The tertiary amine, Me_3N, in leaves of *Chenopodium* species, in blood (0 002 %) and formed by the putrefaction of choline, etc A colorless gas, d 0 673, m −124, b 3 5, soluble in water, alcohol or ether It is poisonous, and has a fishy ammoniacal odor, found in herring brine, and used for rheumatism **t amine oxide** Me_3NO = 75 08 Kanirin A base, m 96, occurring in muscle, urine, fishes, Cephalopods and Crustaceae **t amino hydrochloride** C_3H_9N HCl = 95 6 Colorless crystals, m 271, soluble in water, alcohol or ether, used medicinally **t arsine** C_3H_9As = 120 1 $AsMe_3$ A colorless liquid, d 1 124, b 52 8, soluble in water **t benzene 1 2 3-** Hemimellitene **1 2 4-** Pseudocumene **1 3 5-** Mesitylene **t benzoic acid** $C_{10}H_{12}O_2$ = 164 1 $C_6H_2Me_3COOH$ **2 3 5-** Colorless crystalline needles, m 149, soluble in alcohol or ether **2 4 6-** Isodurylic acid Colorless crystals, m 152, slightly soluble in water, soluble in alcohol or ether **t bismuthine** C_3H_9Bi = 254 07 $BiMe_3$ A colorless liquid, d 2 300, b 110 **t boron** C_3H_9B = 55 89 BMe_3 White crystals, m 56, b 110 **t carbinol** $C_4H_{10}O$ = 74 1 The tertiary alcohol, CMe_3OH A colorless crystalline mass or liquid, m 25, b 82, soluble in water, alcohol or ether See *butanol* **t cyclohexane** Hexahydrocumene **t cyclopentene** Laurolene **t ethylene** C_5H_{10} = 70 1 β-isoamylene, $MeCH\ CMe_2$ A colorless liquid, b 36, insoluble in water, soluble in alcohol or ether, used medicinally as an anesthetic **t gallium** C_3H_9Ga = 114 79 $GaMe_3$ A colorless liquid, m −19, b 55 8 **t glycine** See *betaine* **t naphthalene** Sapotalene **t phosphate** $C_3H_9PO_4$ = 140 1 Me_3PO_4 A colorless liquid, d 1 220, b 197, soluble in alcohol or ether **t phosphine** C_3H_9P = 76 1 Me_3P A colorless liquid, b 40, insoluble in water, soluble in alcohol or ether **t pyridine** Collidine **t quinoline** $C_{12}H_{13}N$ = 171 17 The soluble solids **2 3 4-** m 65, b 285, **2 5 7-** m 43, b 286, **2 3 6-** m 86, b 285, **2 6 8-** m 45, b 266 **t tin** $(C_3H_9Sn)_2$ = (163 77)$_2$ $SnMe_3$ or $Me_3Sn\ SnMe_3$ A colorless liquid, d 1 570, m 23, b 182, insoluble in water Cf *stannane* **t tin bromide** Me_3SnBr = 243 69 White crystals, m 27, b 165 **t tin chloride** Me_3SnCl = 199 23 White crystals, m 37 **t tin hydride** Me_3SnH = 164 78 An oily liquid, b 60 **t tin hydroxide** Me_3SnOH = 180 78 Colorless prisms, decomp 118 **t tin oxide** $(Me_3Sn)_2O$ = 343 54 White amorphous powder **t tin sulfide** $(Me_3Sn)_2S$ = 359 60 Yellow oil, d 1 649, m 6, b 233 **t tryptophane** Is Hypophorine **t xanthine** Caffeine **t urea** $C_4H_{10}ON_2$ = 102 1 $MeNH\ CO\ NMe_2$ Colorless crystals, m 75, b 232, soluble in water, alcohol or ether

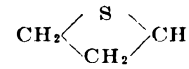
trimethylene C_3H_6 = 42 1 (1) Cyclopropane, q v (2) A prefix indicating three methylene groups (3) The bivalent radical, —CH_2-CH_2CH_2— **acetyl-** $C_5H_8CO\ Me$ = 84 1 A colorless liquid, b 113, insoluble in water, soluble in alcohol **benzoyl-** Benzoyl cyclopropane **keto-** Cyclobutanone **methyl-** C_3H_5Me = 56 0 A colorless gas, b 4, insoluble in water, soluble in alcohol or ether **t bromide** $C_3H_6Br_2$ = 201 90 The liquid $CH_2Br\ CH_2\ CH_2Br$ d 1 97, b $_{720mm}$160 **t cyanide** Glutaronitrile **t diamine** 1 3-Propanediamine **t glycol** 1 3-Propanediol **t group** The bivalent radical —$CH_2\ CH_2$-CH_2— **t imine** C_3H_7N = 57 1 Tetrahydroform, 1 3-propylene imine The heterocyclic compound,



t oxide C_3H_6O = 58 0 1 3-propylene oxide The heterocyclic compound,

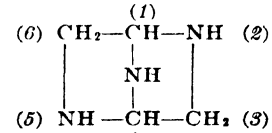


t sulfide C_3H_6S = 74 1 1 3-propylene sulfide The heterocyclic compound,



trimetric Orthorhombic, cf *trimeric*

trimidine $C_4H_9N_3$ = 99 09 The heterocyclic compound



trimolecular Pertaining to three different molecules **t reaction** A third order reaction, q v

trimorphism The phenomenon of crystallizing in three different systems

trimorphous Describing a substance that crystallizes in three different systems

trimyristine Myristine

initrate A compound that contains three nitrate radicals, $(NO_3)_3$

initride Triazo

initrin Nitroglycerin

initro- A prefix indicating that a compound contains three nitro-groups in its molecule **t aniline** Picramide **t anisole** $C_7H_5N_3O_7$ = 243 06 MeO $C_6H_2(NO_2)_3$ White crystals, **2 3 4-** m 155 **2 3 5-** d 1 618, m 104 **2 4 6-** d 1 408, m 68 4 **3 4 5-** m 120 **3 4 6-** m 107 Used as high explosives **t benzene** $C_6H_3(NO_2)_3$ = 213 1 T N B **1 2 4-** Yellow crystals, m 57, slightly soluble in water, used in organic synthesis **1 3 5-** sym Yellow crystals, d 1 688, m 122, decomp by further heat, slightly soluble in water, soluble in alcohol or ether **t cellulose** Pyroxylin **t cresol** $C_7H_5O(NO_2)_3$ = 243 1 1-Methyl-3-hydroxy-2 4 6-trinitrobenzene, $C_6HMe(OH)(NO_2)_3$ Yellow needles, m 105, soluble in water, alcohol or ether, used as an antiseptic and in explosives **t glycerin** Nitroglycerin **t naphthalene** $C_{10}H_5(NO_2)_3$ = 263 1 **1 4 5-** or γ- Yellow needles, m 147, soluble in alcohol **1 3 8-** or β- Yellow monoclinic needles, m 215, soluble in alcohol, ether or chloroform **1 3 5-** or α- Yellow monoclinic crystals, m 122, slightly soluble in water, soluble in alcohol or ether **1 2 5-** or γ- m 113 Used in organic synthesis and as explosives **t orcinol** $C_7H_5O_8N_3$ = 259 10 $C_6(NO_2)_3Me(OH)_2$ A solid, m 163 5, slightly soluble in water, soluble in ether or benzene **t phenol** $C_6H_3N_3O_7$ = 229 05 HO $C_6H_2(NO_2)_3$ α- or **2 4 6-** Picric acid β- or **2 4 5-** m 96 γ- or **2 3 6-** m 117 5 δ- or **2 3 5-** m 120 All are yellow crystals, soluble in water, and used as explosives **t phenyl methyl-tetramine.** Tetryl **t resorcinol** $C_6H(NO_2)_3(OH)_2$ = 245 08 A solid, m 176 (sublimes) Soluble in alcohol or ether, slightly soluble in water **t toluene** $C_7H_5O_6N_3$ = 227 1 **2 4 6-** or α- Trotyl, tolit, trilite, trinol, T N T, 1-methyl-2 4 6-trinitrobenzene, $C_6H_2Me(NO_2)_3$, pale yellow monoclinic leaflets d 1 654, m 80 6, slightly soluble in water, alcohol or ether Used similarly to picric acid in explosives **2 3 4-** or β- Colorless leaflets, d 1 62, m 112, insoluble in water, slightly soluble in alcohol, soluble in ether **3 4 5-** or δ- m 137 5 **2 3 5-** or ε- m 97 2 **2 3 6-** or ζ- m 79 5 **2 4 5-** or γ- Colorless crystals, d 1 62, m 104, insoluble in water, soluble in ether Used as high explosives **t triazidobenzene** $C_6N_{12}O_6$ = 336 0 Turek detonator, $(NO_2)_3C(N_3)_3$ Greenish-yellow crystals m 131 forming hexanitrobenzene, insoluble in water, used as a detonating high explosive **t xylene** $C_6H(NO_2)_3Me_2$ = 241 13 T N X **2 4 6 1 3-** m 182, **2 3 5 1 4-** m 140

initrol Erythrol tetranitrate

inol Trinitrotoluene

triol A suffix indicating 3 hydroxy-groups present, as, propanetriol, $C_3H_5(OH)_3$, glycerol

iolein Olein

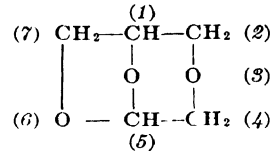
ional $C_8H_{18}O_4S_2$ = 242 3 Sulfonethylene methane, $EtC(SO_2Et)_2Me$ A colorless crystalline powder, m 76, slightly soluble in water, used medicinally as a hypnotic

trione A suffix indicating the presence of 3 keto groups, =CO

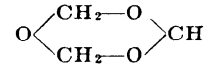
iose $C_3H_6O_3$ = 90 1 A group of monosaccharides derived from glycerol

CHO CHOH CH_2OH and CH_2OH CO CH_2OH

trioxa- A prefix indicating three oxygen bridges in a ring system, as, **t bicyclo octane** $C_5H_8O_3$ = 116 1

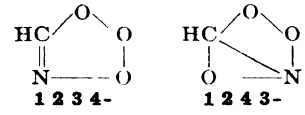


trioxan(e) $C_3H_6O_3$ = 90 1 Paraformaldehyde The heterocyclic compound,



White crystals m 63, used in organic synthesis

trioxazole CHO_3N = 75 0 The heterocyclic compounds,



trioxide Teroxide A binary compound that contains three oxygen atoms in its molecule *E g*, Fe_2O_3, iron trioxide, SO_3, sulfur trioxide

trioxin Paraformaldehyde

trioxime A compound containing three =NOH radicals

trioximido- A prefix indicating that the compound contains three —CH N OH groups in its molecule **t propane** $C_3H_6O_3N_3$ = 132 08 HON CH—C(NOH) -CH NOH Colorless crystals, m 171

trioxy- (1) A prefix indicating the presence of three oxygen atoms in the compound generally as —C O groups (2) Trihydroxy **t methylene** Paraformaldehyde **t purine** Uric acid

tripalmitin Palmitin

tripan roth Trypan red

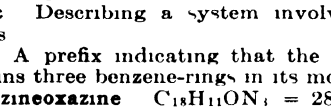
tripestone A concretionary form of anhydrite

triphane Spodumene

triphasic Describing a system involving three phases

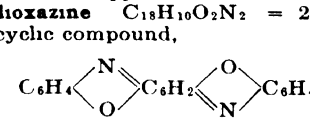
triphen- A prefix indicating that the compound contains three benzene-rings in its molecule

triphenazineoxazine $C_{18}H_{11}ON_3$ = 285 2 The heterocyclic compound,



triphenin $C_{11}H_{15}O_2N$ = 193 2 Propionylphenetidine, $EtC_6H_4ONH(OC\ CH_2\ Me)$ Colorless crystals, m 120, soluble in water, used medicinally as an antipyretic

triphenodioxazine $C_{18}H_{10}O_2N_2$ = 286 2 The heterocyclic compound,

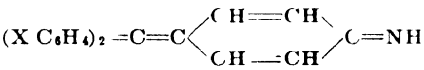


triphenol Triatomic phenol A compound having three —OH groups in an unsaturated ring

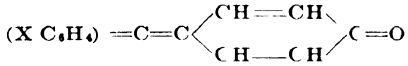
triphenyl- A prefix indicating that the compound contains three phenyl radicals in its molecule **t acetic acid** $C_{20}H_{16}O_2$ = 288 23 The monobasic acid, CPh_3COOH Colorless monoclinic crystals, m 264 (decomp), slightly soluble in water, soluble in alcohol **t amine** $C_{18}H_{15}N$ = 245 22 The tertiary amine, Ph_3N Color-

less monoclinic prisms, m 127, b 347, slightly soluble in alcohol, soluble in benzene or ether **t benzene** $C_{24}H_{18}$ = 306 26 The aromatic hydrocarbon, $C_6H_3Ph_3$ (1 3 5-) Colorless rhombic crystals, d 1 206, m 169, b above 300, insoluble in water, slightly soluble in alcohol or ether **t bismuthine** $C_{18}H_{15}Bi$ = 440 12 Bismuth triphenyl, $BiPh_3$ White monoclinic crystals, d 1 585, m 78, very soluble in chloroform **t carbinol** $C_{19}H_{16}O$ = 260 22 The tertiary alcohol, $Ph_3C\,OH$ Colorless hexagonal prisms, m 159, b above 360, insoluble in water, soluble in alcohol, ether or benzene used in organic synthesis, and in the manufacture of triphenylmethane dyes *amino-* $C_{19}H_{15}O(NH_2)$ = 275 2 $NH_2C_6H_4\,CPh_2OH$ meta-, m 155, para m 116 *diamino-* $C_{19}H_{14}O(NH_2)_2$ = 290 2 $(NH_2C_6H_4)_2CPhOH$ **t ethane** $C_{20}H_{18}$ = 258 15 $Ph_2CH\,CH_2Ph$ Colorless crystals, m 54, b 349 4 **t ethylene** $C_{20}H_{16}$ = 256 4 α-phenylstilbene The hydrocarbon $Ph_2C\,CHPh$ **t guanidine** $C_{19}H_{17}N_3$ = 287 17 $PhN\,C\,(NHPh)_2$ *alpha-* A solid, m 143, decomp by further heat soluble in alcohol *beta-* A solid, m 131, soluble in water, alcohol, or ether **t methane** $C_{19}H_{16}$ = 244 2 The hydrocarbon, Ph_3CH Colorless leaflets, d 1 057, m 92 b 258, insoluble in water, soluble in alcohol ether, benzene or chloroform Used in organic synthesis and in the manufacture of dyes **t methane dyes** A group of dyes derived from triphenylcarbinol by the introduction of auxochromic groups Classification

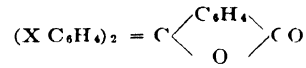
(1) fuchsin group



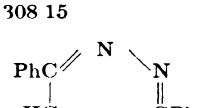
(2) aurin group



(3) phthalein group



t methyl $C_{19}H_{15}$ = 243 2 A "free radical" compound, Ph_3C, colorless crystals, m 300 b 420 (cf *hexaphenylethane, triphenylmethyl*) **t phosphine** $C_{18}H_{15}P$ = 262 3 Ph_3P Colorless monoclinic crystals, m 15, insoluble in water, soluble in alcohol or ether **t pyridazine**

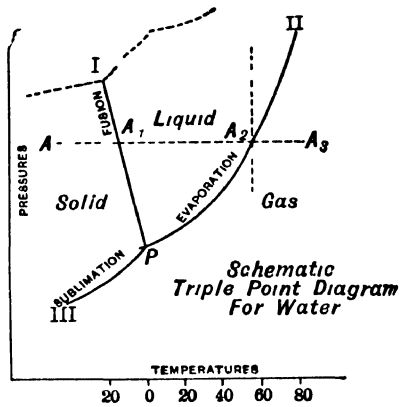


Colorless crystals, m 171 **t stibine** $C_{18}H_{15}Sb$ = 352 9 Ph_3Sb **t tin** $C_{18}H_{15}Sn$ = 349 82 Tin triphenyl $SnPh_3$ White powder, m 232 decomp 280 **t tin chloride** Ph_3SnCl = 385 27 White crystals, m 106, b $_{13mm}$240, insoluble in water, used as reagent for fluorides

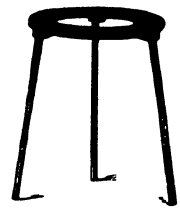
triphenylene $C_{18}H_{12}$ = 228 1 The tetracyclic hydrocarbon, $C_6H_4{<}_{C_6H_4}{>}C_6H_4$

triphylite $LiFePO_4$ A native lithium iron phosphate, greenish-blue rhombic crystals

triple Threefold **t bond** The acetylene linkage, —C C—, which is readily saturated It is indicated by the suffix -yne* replacing the former -ine, as, propyne* (propine) **t chlorides** A group of complex chlorides of the type $M_4M\,M_2Cl_{12}$ in which M is Na, K, Cs, or NH_4, M is either Zn, Cu, Hg, Ag_2, or Au_2, and M is trivalent Au **t nitrite reagent** A solution of 120 gm sodium nitrite, 9 1 gm copper acetate, 16 2 gm lead acetate, 2 cc acetic acid in 50 cc water It gives crystals of characteristic shape with potassium salts **t phosphate** (1) A magnesium, calcium, ammonium phosphate sometimes found in urine (2) Treble superphosphate A phosphate rock containing 3 times as much phosphoric acid as superphosphate **t point** The conditions (expressed in terms of vapor-pressure curves)



under which three phases can exist in equilibrium, *e g*, in the system ice-water-water vapor, at the pressure of 4 57 mm and temperature of 0 008°C See figure, and *phase rule, diagram, quadruple* **t salts** A group of compounds whose molecules consist of three cations and one anion, as $Na_2CaCu(NO_2)_6$


Tripod

triplet See *multiplet*

triplite $(Fe,Mn)_3F_2PO_4$ A greasy mineral

tripod A three-legged support for holding flasks or other containers over a bunsen burner

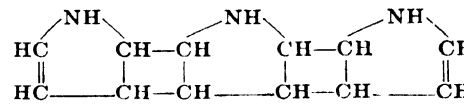
tripoli Rottenstone Decomposed limestone used for polishing **t powder** Kieselguhr

tripolite A variety of native silica secreted by diatoms Cf *kieselguhr*

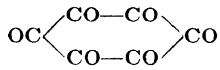
trippkeite A native copper arsenate

tripropyl A prefix indicating the presence of three propyl radicals **t amine** $C_9H_{21}N$ = 143 2 The tertiary amine $(C_3H_7)_3N$ A colorless liquid, m 15 slightly soluble in water readily soluble in alcohol or ether

tripyrrole $C_{12}H_{15}N_3$ = 201 15 The heterocyclic compound



triquinoyls The oxidation-products of hexahydroxybenzene (1) C_6O_6 = 168 0 Hexaoxybenzene



(2) $C_6H_{10}O_{14}$ = 312 16 A solid, decomp 95, slightly soluble in water, insoluble in alcohol or ether

riricinolein Ricinolein

risaccharide A carbohydrate that contains three monosaccharides in its molecule, and hydrolyzes to three simple sugars, *e g* , $C_{18}H_{32}O_{16}$, or $(C_6H_{10}O_5)_2\ H_2O$, raffinose

risalyt A mixture of cyanides ($NaCN$, $Zn(CN)_2$) and $NaHSO_3$ used in electroplating

risazo- A prefix indicating the presence of three azo-groups, —N N—, in the molecule of a compound

risilane Si_3H_8 = 92 2 A colorless liquid, m -117, b 53, unstable at ordinary temperatures

risilicic acid $H_4Si_3O_8$ = 216 3 A white insoluble powder

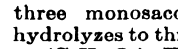
ristearin Stearin

risulfide A binary compound that contains three sulfur atoms in its molecule *E g* , Fe_2S_3, iron trisulfide, Na_2S_3, sodium trisulfide

ritartaric acid Uvic acid

riterium Tritium

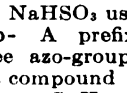
rithiane $C_3H_6S_3$ = 138 05



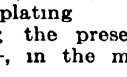
$CH_2\ S\ CH_2\ CH_2$, *s-* or *1 3 5-*

rithioacetaldehyde Sulfo-paraldehyde

rithioazol $CHNS_3$ = 123 2 The heterocyclic compounds,



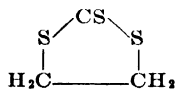
1 2 3 4-



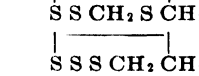
1 2 4 3-

rithiocarbonic acid See *thiocarbonic acids*

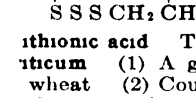
rithiocarbonicethidene ester $C_3H_4OS_2$ = 152 2 The heterocyclic compound,



rithiolane $C_2H_4S_3$ = 124 05



$S\ S\ CH_2\ S\ CH_2$, *1 2 4-* or



$S\ S\ S\ CH_2\ CH_2$, *1 2 3-*

rithionic acid The sulfur acid, (q v) $H_2S_3O_6$

riticum (1) A genus of grasses which includes wheat (2) Couch grass, dog grass The dried rhizomes of *T* or *Agropyron repens*, a Graminеae It contains carbohydrates and malates, used medicinally as a diuretic

ritium T or H^c = 3 00 Triterium An isotope of hydrogen (q v) having a mass of 3 and obtained with deuterium (q v) by the electrolysis of water

riton-B Tetramethyl ammonium hydroxide **t -F** Dimethyl dibenzyl ammonium hydroxide Used as solvents for cellulose, for saponifying fats, and in inorganic synthesis

ritopine $C_{42}H_{54}O_7N_2$ = 698 4 An alkaloid from opium, colorless scales, m 182

riturate To grind or rub to a powder (usually with a liquid) in a mortar

rituration Any finely-powdered drug, or a mixture of milk-sugar and a drug

rityl The radical triphenylmethyl, Ph_3C—

triuret $C_3H_6N_4O_3$ = 146 06 Carbonylurea $(NH_2CONH)_2CO$ Cf *biuret*

trivalent Tervalent Describing an atom or radical that has a valency of three

trivalerin Phocenin

troche A tablet or medicated disk

troctolite A granitoid, crystalline, plutonic rock containing olivine and felspar

trogerite A native hydrous uranium arsenate

troilite A native form of FeS

trommel A cylinder of perforated steel plate revolving around an inclined central axis, used for large-scale sifting purposes

Trommer's test A test for glucose in urine On warming the sample with sodium hydroxide and copper sulfate, a yellowish-red precipitate indicates sugar

Trommsdorff, Johann Bartholomäus 1770–1837 A German apothecary noted for chemical analysis, teachings and writings, founder of *Journal der Pharmazie*

tron(a) $Na_2CO_3\ NaHCO_3\ 2H_2O$ A native sodium carbonate and sodium bicarbonate Cf *natron*, *urao* **t potash** Kemfert A high grade KCl from Searles Lake, California, 58–62 % K_2O, used for fertilizers

troostite (1) A native zinc-magnesium silicate (2) A transition form of cementite, austenite and ferrite, it is an emulsified ferrite Cf *steel*

tropacocaine $C_{15}H_{19}O_2N$ = 245 17 Benzoylpseudotropine, $C_5H_9N\ CH_2\ CH\ O\ COPh$ An alkaloid obtained from coca leaves Colorless glistening crystals, m 49, slightly soluble in water, soluble in alcohol or ether, used medicinally as a local anesthetic **t hydrochloride** $C_{15}H_{19}O_2N\ HCl$ = 281 62 Colorless crystals, m 271, soluble in water, used as a local anesthetic

tropæolin Tropeolin

tropaic acid Tropic acid

tropan $C_8H_{15}N$ = 125 1 *N*-methyl nortropan The hydrocarbon of tropine, q v

tropate Any salt of tropic acid

tropeine Any ester of tropine and an organic acid, as atropine or hyoscyamine

tropeolin Tropaeolin A group of hydroxy-azo dyes of the type, $R—N_2—C_6H_4\ SO_3Na$, the sodium salts of R-azobenzenesulfonic acids, as

tropeolin D, or methyl orange, p-dimethylaminoazobenzenesulfonic acid, where R is $Me_2NC_6H_4$—

tropeolin O, yellow T, or resorcinol yellow, resorcinolazobenzenesulfonic acid, where R is $(HO)_2C_6H_3$— Used as pH indicator, changing at 12 0 from yellow (acid) to brown (alkaline)

tropeolin OO, diphenylamine orange, orange IV or phenylamineazobenzenesulfonic acid, where R is $PhNH\ C_6H_4$— Used as a pH indicator, changing from red (1 3) to yellow (3 2)

tropeolin OOO 1, alpha-naphtholorange, orange I, where R is $HO\ C_{10}H_6$—

tropeolin OOO 2, beta-naphtholorange, orange II, where R is $HO\ C_{10}H_6$—

Some of these dyes are used as indicators, and in dyeing woolen and silken fabrics

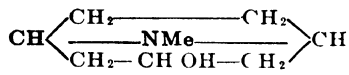
tropic acid $C_9H_{10}O_3$ = 166 1 Phenylhydracrylic acid, tropaic acid An optically-active aromatic hydroxyacid, $CH_2OH\ CHPh\ COOH$, obtained by hydrolysis of atropine **l-** Colorless crystals, m 117, decomp by further heat, soluble in water **d-** m 127 **l-** m 123

tropidine $C_8H_{13}N$ = 123 1 *N*-methylnortropidine An oily liquid obtained by dehydration of tropine, d 0 95, b 162, insoluble in water, soluble in alcohol or ether Cf *nortropidine*

tropilidene C_7H_8 = 92 1 *1 3 5*-Cycloheptatriene An oily liquid, d 0 903, b 117, prepared by distilling tropine with soda-lime

tropin See *sensitizer* (2)

tropine $C_8H_{15}ON$ = 141 2 Tropanol-3, 3-hydroxytropan A heterocyclic alcohol, occurring as ester in atropine and hyoscyamine



Colorless needles, m 62, b 220, soluble in water, alcohol, or ether **iso-** See *atropine* **pseudo-***ψ*-tropine An optically-inactive isomer obtained by heating t with phenyl amylate It is a hydrolytic split-product of Java coca plants Colorless needles, m 108, b $_{755mm}$237, soluble in water or alcohol **t alkaloids** See *atropine, cocaine, ecgonine* **t carboxylic acid** Ecgonine **t sulfate** $(C_8H_{15}ON)_2H_2SO_4$ = 380 6 A white crystalline powder, soluble in water or alcohol

tropopause The altitude at which the temperature of the atmosphere ceases to decrease with increase in height

trotyl Trinitrotoluene

Trouton, Frederick Thomas An English physicist **T 's rule** The molal latent heat or heat of evaporation, ΔH_m, is equal to about twenty times the boiling point T_b (absolute), $\Delta H_m/T_b$ = 20 22 Exceptions exist, as, water or alcohol Cf *Hildebrand's rule, Dieterici's rule* It can also be expressed by $T_{760mm} = T_p(1\ 648 - 0\ 255 \log p)$ where T_{760mm} is the boiling point (at 760 mm), and p the pressure

troy A system of weights and measures used by jewelers 1 oz troy = $\frac{1}{12}$ pound = 480 grains = 20 pennyweights = 1 09714 oz avoir = 1 oz apoth = 31 1035 grams 1 pound troy = 5760 grains = 240 pennyweights = 13 1667 oz avoir = 0 82286 pds av = 373 2509 grams **t weights** The weight system used in reports on gold, silver, or precious metals

1 oz troy = $20 67 = 85 shillings gold value
1 pd troy = $248 04 = 51 pounds sterling

Trubenizing A process for permanently stiffening fabrics and making them unshrinkable, by inserting a cellulose acetate thread between the cotton or linen and calendering with a cellulose acetate solvent

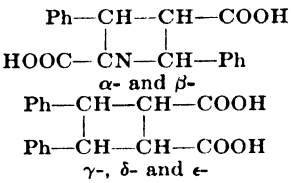
trust An absolute or near control of the source, manufacture or sale of a commodity within a political area, as (in 1939)

	A, Per cent	B, Per cent	C, Per cent
I G Farbenind (*Germany*)	100	90	85
Imp Chem Ind (*England*)	40	95	100
Kuhlman, etc (*France*)	80	70	40
Union Chimique (*Belgium*)		100	

A = Dyes B = Acids and heavy chemicals
C = Synthetic nitrogen Cf *monopoly*

truxelline An alkaloid obtained from coca leaves It consists of an ester of ecgonine and truxillic acids

truxillic acid $C_{18}H_{16}O_4$ = 296 1 A dimer of cinnamic acid obtained from coca leaves There are five stereoisomeric compounds, the *γ*- and *δ*-isomer is *truxillic acid* Cf *norpinic acid*



truxinic acid $C_{18}H_{16}O_4$ = 296 1 An isomer of truxillic acid, q v

trypaflavin(e) Diamino methyl acridinium chloride A yellow dye which darkens on exposure, used in a 0 1 % solution as a bactericide Cf *acriflavine*

trypan blue Diamine blue, congo blue, azidin blue, Niagara blue, sodium tolidin-disazo-bi-1-amino-8-naphthol-3 6-disulfonic acid

$[(NaSO_3)_2C_{10}H_3(NH_2)OH\ N\ N\ C_6H_3Me—]_2$

A bluish-gray powder Used as a dye, and medicinally, as an antiprotozoan agent in malaria and trypanosomiasis

trypan-red Tripanroth A brown powder, used as a dye and medicinally, as an antiprotozoan agent

tryparsamide $C_8H_{10}AsN_2O_4Na$ = 287 0 Sodium *N*-phenylcinnamide-*o*-arsonate

$NH_2\ CO\ CH_2\ NH\ C_6H_4\ AsO(OH)ONa$

A white powder, used to treat sleeping sickness and neurosyphilis Cf *carbarsone, acetarsone*

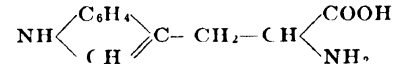
trypsase Trypsin

trypsin Trypsase Alkali proteinase An enzyme of pancreatic juice that hydrolyzes proteins to proteoses, and proteoses to true peptones (tryptones) and finally to leucine and tyrosine A yellowish powder, soluble in water, it is most efficient in a slightly alkaline solution

tryptic activity The hydrolytic or digestive power of trypsin

tryptone The true peptones produced by trypsin, as distinct from pepsin peptones

tryptophane $C_{11}H_{12}O_2N_2$ = 204 2 Indylalanine, *α*-amino-*β*-indyl propionic acid, indolealanine An aromatic amino acid and split-product of proteins



It occurs naturally in the seeds of *Erythrina hypaphorus*, a Leguminosae, and is a colorless solid, m 289, soluble in water, insoluble in alcohol or ether **trimethyl-** Hypophorine

tryptophyl The monovalent radical, $C_{11}H_{11}ON_2$—, derived from tryptophane

T S An abbreviation for test-solution

tschermigite A native ammonium alum

Tschugajew's reaction A test for nickel The formation of a scarlet-red precipitate on the addition of dimethylglyoxime to a weak ammoniacal, nickel-salt solution

tsugaresinol $C_{20}H_{20}O_6$ = 356 2 Sulfite liquor lactone, *l*-conidendrin A lignin lactone in sul-

fite waste liquor, and in Japanese hemlock (*Tsuga sieboldii*) White crystals, m 250 (approx)

T-stoff See *xylyl bromides*

T T Tuberculin-tested, as applied to milk from tuberculin-tested cows

Tu The symbol for thulium, element At No 69

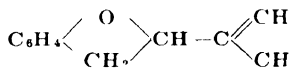
tuba root Derris root

tubacurarine $C_{19}H_{26}N_2O$ = 298 21 An amorphous brown alkaloid from curare

tubaic acid $C_{12}H_{12}O_4$ = 220 09 A constituent of derris root q v **iso-** See *rotenic acid*

tubain A resin from *derris root*, q v

tubanol $C_{11}H_{12}O$ = 160 0 A split-product of rotenone



hydroxy-carboxy- Tubaic acid **tetrahydro-2-**Isoamylresorcinol

tubatoxin Rotenone

tub-sizing An operation in paper-making in which high-class writing papers are passed through a bath of gelatin and slowly dried in air, in order to increase the strength and improve the writing surface

tube Any long and hollow device **absorption-** See *absorption tube, a cell* **agglutination-** A small test-tube **Arndt-** q v **arsenic-** A long glass-tube with drawn-out tip or jet bent at an angle of 120° Cf *Marsh test* **Babcock-** See *Babcock bottle* **barometer-** A narrow tube closed at one end and more than 32 inches long **Brown-** A potash bulb **calcium chloride-** A glass-tube of varied shape, filled with $CaCl_2$, used to dry gases **capillary-** A glass tube with a fine bore (1 mm or less) **cathode-** q v **centrifuge-** A thick-walled glass-container of varied shape, for use in a centrifuge **colorimeter-** A flat-bottomed test tube of clear white glass, for use in colorimeters **combustion-** A glass tube, resistant to heat **comparison-** A colorimeter t **condenser-** The inner tube of a condenser **Coolidge-** An x-ray tube with electrically-heated cathode **Crookes-** A vacuum tube exhausted to such an extent that x-rays are produced on the passage of an electric current **culture-** A test-tube for growing bacteria **Dorn-Goetz-** A vacuum tube for spectroscopic work **drying-** A glass-tube, variously shaped filled with a drying agent **Emmerling-** An absorption t **extraction-** See *Soxhlet apparatus* **fermentation-** Saccharometer An inverted test-t for collecting gases **filter-** A glass-tube for connecting Gooch crucibles to a source of suction **funnel-** A long glass-tube with conical top **Geissler-** A tube that contains traces of gas at low pressure used to produce the characteristic spectrum of the gas by the passage of an electric current **Giltner-** A t for anaerobic cultures **guard-** (1) A metal casing to protect glass ware from mechanical injury (2) See *guard* **Hinman-** A t for determining ammonia **Hittorf-** A modified Crookes t **Hortvet-** A centrifuge t **La Bel-** A t for fractional distillation **melting point-** A thin-walled capillary tube **Nessler-** Colorimeter t **Peligot-** Calcium chloride t **Pitot-** A manometer to record pressure **Plucker-** A vacuum t for spectroscopic work **T-** A T-shaped glass-tube used in making three-way connections **test-** A glass-tube, closed at one end and made of heat- and acid-resistant glass **thistle-** A funnel-tube with bulb-shaped end, called a thistle top **U-** A U-shaped glass-tube **vacuum-** A glass vessel that has been highly evacuated, as, a Crookes or Geissler tube **X-** A cross-shaped tube for making four-way connections **x-ray-** See *x-ray tube* **Y-** A Y-shaped glass-tube used for making three-way connections

tuberculin A therapeutic preparation obtained by the extraction of tubercle bacillus with various solvents usually by long grinding in a bacteria mill

tuberculostearic acid $C_{19}H_{38}O_2$ = 298 2 *10-*Methylstearic acid A fatty acid from bovine tubercle bacilli Cf *phthioic acid*

tuberin A globulin from potato juice, representing about 50 % of the total protein present

tubers The underground stems of plants that serve as storage receptacles for reserve materials Two tubers are official and used medicinally, aconite and jalap

tubing Glass or rubber tubes used in the construction and connection of chemical apparatus **alundum-** A hollow alundum rod **glass-** A hollow glass-rod **pressure-** A heavy-walled rubber hose for connecting pressure or vacuum lines **rubber-** A round, flexible and hollow tube used to connect devices for the passage of liquid or gaseous materials **silica-** A transparent or opaque, hollow rod of silica, used for the combustion of substances at high temperatures

tubule A small tube or neck on a glass apparatus

tufa A calcareous sinter or sedimentary rock composed of calcium carbonate and silica, formed by chemical reaction from lake or ground water, as, travertine Cf *tuff*

tuff A sedimentary rock composed of volcanic dust ash and cinders (cf *tufa*)

tulipiferine An alkaloid obtained from the bark of *Liriodendron tulipifera* a Magnoliaceae

tulip tree The tree *Liriodendron tulipifera*, a Magnoliaceae of North America

tumbago An alloy of 33 % gold, 12 % silver and 55 % copper of ancient origin, found in Columbia

tung oil Chinese wood oil A rapidly-drying oil extracted from the nuts of *Aleurites cordata* and *A fordii*, an euphorbiaceous tree of China, and Japan, and now cultivated in Florida A yellow jellifying liquid, d 0 936–0 942 used for paints, varnishes, enamels and linoleum It replaces linseed oil and gives a higher gloss and a more water-resistant finish Cf *lumbang oil, bancoul nuts* **t pomace** Tung oil cake The ground and dried remains of the seeds after the oil has been extracted It contains 5–6 % N, 2 % P and 1 3 % K_2O, used as fertilizer

tungstate Wolframate A salt of tungstic acid of the general type M_2WO_4 **meta-** A salt of metatungstic acid of the general type, $M_6W_4O_{13}$, as, sodium metatungstate, $Na_6W_4O_{13}$ **para-** A salt of paratungstic acid of the general type, $M_{10}W_{12}O_{41}$

tungsten W = 183 92 Wolfram, wolframium A heavy metal and element, atomic number 74 A gray to black hard, brittle powder, d 19 10, m 2974 b 6700, insoluble in water soluble in nitric acid and hot hydroxide solutions Its valencies are 2, 4, 5 and 6 It occurs in nature in wolframite, scheelite, and tungstite, and is used (as ferrotungsten) in the manufacture of steel for high-speed tools and of metallic filaments (m 3100°C) for electric light bulbs **ferro-** An alloy obtained in the electric furnace

used for high-speed tools, W (7–9 %) Cr (2–3 %), and Fe **orange-** $Na_2WO_4 W_2O_5$ Saffron bronze, tungsten-sodium tungstate Gold colored scales, insoluble in ordinary solvents, used as a pigment **violet-** $K_2W_3O_9 W_2O_5$ Potassium tritungstate, a bluish-black powder, used as a pigment

t alloy See *ferrotungsten, steel partinium*

t bronze An alkali-metal salt of polymerized tungstic acid, as orange t and violet t , q v

t carbides (1) WC d 15 7, m 2780 (2) W_2C d 16 06, m 2880 (3) W_3C m above 2700 *cemented-* An extremely hard alloy of WC embedded in tungsten and 5–15 % Co, d 14–15, hardness, second to diamond Used for high-speed machine tools Cf *carboloy, widia*

t chlorides T dichloride, WCl_2, t tetrachloride, WCl_4, t pentachloride, WCl_5, t hexachloride, WCl_6

t dichloride WCl_2 = 254 9 An amorphous gray powder, decomp by water

t dioxide WO_2 = 216 0 A brown, rhombic, crystalline powder, d 12 11, insoluble in water, soluble in acids or alkalis

t disulfide WS_2 = 248 1 A dark gray crystalline powder, d 7 5

t fluoride WF_6 = 298 0 A gas

t hexachloride WCl_6 = 396 8 Dark blue, cubic crystals, d 13 3, m 275, b 346, slightly soluble in water, soluble in carbon disulfide

t minerals The most common ores are the tungstates and sulfide

tungstenite	WS_2
stolzite	$PbWO_4$
ferberite	$FeWO_4$
wolframite	$(Fe\ Mn)WO_4$
hulsnerite	$MnWO_4$
scheelite	$CaWO_4$
cuprotungstite	$CuWO_4$

t oxides T dioxide, WO_2, t pentaoxide, W_2O_5, t trioxide, WO_3

t oxychloride $WOCl_4$ = 341 63 Tungstyl chloride A dark red crystalline mass, m 209, b 227, rapidly decomp by water, it absorbs moisture from the air

t pentachloride WCl_5 = 361 3 Black needles d 3 52, m 248, b 275, decomp in water, slightly soluble in carbon disulfide

t pentoxide W_2O_5 = 448 0 Blue tungstic oxide A blue powder, insoluble in aqua regia

t tetrachloride WCl_4 = 325 8 A gray crystalline powder, decomp by water or heat

t trioxide WO_3 = 232 0 Tungstic acid anhydride A yellow, rhombic, crystalline powder, d 7 16, m at red heat, insoluble in water or acids, soluble in strong alkalis Used in the manufacture of metallic tungsten for lamp filaments

t trisulfide WS_3 = 280 2 A black powder, slightly soluble in water, soluble in alkalis or sulfide solutions

tungstic Pertaining to pentavalent or hexavalent tungsten

t acid H_2WO_4 = 250 02 A yellow crystalline powder, insoluble in water soluble in hydrofluoric acid or alkalis It forms a hydrate H_2WO_4,H_2O

t acids A group of acids derived from hexavalent tungsten by polymerization of tungstic acid

tungstic acid ($WO_3 + H_2O$), or H_2WO_4
*meta*tungstic acid ($4WO_3 + H_2O$), or $H_2W_4O_{13}$
*para*tungstic acid ($12WO_3 + 5H_2O$), or $H_{10}W_{12}O_{14}$

t ocher Tungstite

tungstite Tungstic ocher Wolframine Native WO_3

tungstosilicic acid $H_8Si_1W_{12}O_{42}$ A compound isomeric with silicotungstic acid, which forms hydrates with water

tungstyl The tetravalent radical, $\gg WO$

tuning fork A forked-shaped metal instrument with two prolonged arms which may be set in rapid and sustained vibrations at an almost constant frequency, by means of a sharp blow Electrically-sustained tuning-forks are used for synchronizing vibrations

tuno gum Chicle

tupelo A forest tree of North America *Nyssa aquatica*, or cotton gum tree, a Cornaceae of the Mississippi valley Used as a commercial timber, the spongy wood of the roots is used medicinally for sponge tents

turacin A crimson pigment containing copper obtained from the feathers of the turakoo, an African bird Cf *tetronerythrin*

turaco-porphyrin A chromophoric substance, similar to hematoporphyrin, obtained from turacin

turanose $C_{12}H_{22}O_{11}$ = 342 18 A disaccharide, consisting of glucose and fructose, formed by partial hydrolysis of melezitose

turbid Describing the slight cloudiness of a solution caused by a precipitate or by fine suspended particles

turbidimetry The determination of the quantity of matter, in the form of fine suspended particles in a liquid, by measuring the thickness of the liquid that produces a reduction in the visual transmission as compared with a standard solution or a standard pattern Used in the examination of water and colloidal suspensions Cf *nephelometry*

turbidity value The temperature at which a solution of an oil in a solvent (*e g* , alcohol or acetic acid) shows the first signs of turbidity when cooled under specified conditions Cf *Valenta value*

Turek detonator Trinitrotriazido benzene

turkey corn Corydalis

t pea Tephrosia

t red (1) Harmala red A coloring matter from the seeds of *Peganum harmala*, a Rutaceae (2) Madder

t red oil A material obtained by the action of cold concentrated sulfuric acid on castor oil Used as a wetting agent, and in the preparation of cotton for dyeing with alizarin, etc

turmeric Indian saffron, curcuma The dried rhizomes of *Curcuma longa*, a Scitaminaceae Used as a condiment, medicinally as the fluid extract, and chemically as an indicator (see *curcuma*)

t paper Curcuma paper

t root Hydrastis

Turnbull's blue $Fe_3(FeC_6N_6)_2$ Insoluble Prussian blue A deep-blue precipitate, obtained from excess of a ferrous salt and a solution of potassium ferricyanide

turnsole (1) Litmus (2) A dye prepared from *Chrozophora tinctoria*, an Euphorbiaceae of the Mediterranean countries

turpentine Pine cone oil Terebenthene Terebinthina An oleoresin from various coniferous trees, especially those of the Pinus species Yellowish, sticky masses of characteristic balsamic odor It contains an essential oil, used in the manufacture of turpentine oil

Aleppo-	from *Pinus halepensis*
Bordeaux-	from *Pinus maritima*
Canada-	from *Pinus maritima*
Carpathian-	from *Pinus cembra*
common-	from *Pinus palustris*, *P sylvestris*

Hungarian	from *Pinus pumilio*
larch	from *Larix europaea*
Strassburg-	from *Abies pectinata*
Venice-	from *Larix europaea*

Cf *colophony, terebena, terpinene, sylvestrene*

Chinese- The volatile oil from *Pistacia terebinthus*, an Anacardiaceae **t oil** An essential oil distilled from turpentine, and consisting of a number of terpenes, (pinene, sylvestrene, dipentene) A colorless volatile liquid, d 0 869, insoluble in water, soluble in alcohol, oils or benzene Used extensively as a solvent and vehicle for paints, varnishes, disinfectants, and in pharmacy

turpeth The root of *Ipoemoea turpethum*, a Convulvulaceae of India used as a cathartic and substitute for jalap **t mineral** Mercuric subsulfate

turquoise Callaite, callainite A hydrous phosphate of aluminum colored blue by a copper compound, used as a gem

turtle oil An oil from the muscles and genital glands of the giant sea-turtle, m 24 6–25 6, d 0 9112, $[n]^{40}$ 1 4599, sapon no 209, iodine no 64 6 Used as a cosmetic

tussol $C_{19}H_{20}O_4N_2$ = 340 2 Antipyrine mandelate, phenylglycolantipyrine $C_{11}H_{12}N_2OPh\text{-}CHOH\ COOH$ A white crystalline powder, soluble in water, used medicinally for whooping cough

tutanag Chinese spelter An alloy of lead and tin used for canisters and tea chest linings

tutia Tutty An obsolete term for zinc carbonate

tutin $C_{17}H_{20}O_7$ = 336 2 A poisonous glucoside from the leaves and stems of the toot plant, a *Coriaria* species of New Zealand

tutocaine $C_{14}H_{22}N_2O_2$ HCl Butamin, γ-dimethylamino-α-β-dimethylpropyl-*p*-aminobenzoate, hydrochloride, *p*-aminobenzoyl-dimethylaminomethyl butanol hydrochloride, $Me_2N\ CH_2\ CHMe\ CHMe\ OCOC_6H_4NH_2$ HCl Colorless needles, m 214, soluble in water, used as a local anesthetic

Tutton's salts A group of double salts, $M'M''(SO_4)_2\ 6H_2O$, resembling the alums, (q v), where M' is NH_4, K, Tl etc, M'' is Mg, Zn, Fe, etc and S can be replaced by Se

tutty Tutia

tuyère Tweer A pipe inserted into the walls of a furnace through which an air blast is forced into the furnace

Tw An abbreviation for degrees on the Twaddell hydrometer

Twaddell A hydrometer scale (q v) generally used for technical purposes If the specific gravity is d

$$Tw° = 200(d - 1), \text{ or } d = (Tw° + 200)/200$$

Twaddle Twaddell

tweer, twere Tuyere

twin One of a closely-connected pair **t crystals** A pair of crystals which have grown together in contact They may coalesce except for a few faces, and usually form a symmetrical figure (a cross or star) **t. electrons.** A pair of electrons that are supposed to form a chemical bond, each atom providing one electron, as in H Cl Thus, the pair of electrons between H and Cl in HCl consists of the single electron from hydrogen and the seventh electron of chlorine See *Lewis' theory, polar bond* **t nuclei** Describing a bicyclic structure, an organic compound that contains two connected rings, as in naphthalene

Twitchell reagent A catalyst of fat hydrolysis, prepared by the action of sulphuric acid on oleic acid and naphthalene It is regarded as a sulphonated addition-product of naphthalene and oleic acid with formula, $C_{18}H_{35}O_2\ C_{10}H_6SO_3H$ **T process** The splitting of fats by steam in loosely-covered tanks with the aid of T 's reagent (about 0 5 per cent on the weight of the fat) Cf *Pfeilring reagent*

tylithin Lithium acetyl salicylate

tylmarin Acetyl-*o*-coumaric acid, used medicinally as an antiseptic

tylophorine An alkaloid from *Tylophora asthmatica*, an asclepiadaceous tree of Southern Asia, used medicinally as an emetic

tympan A thick paper, often impregnated with oil or glycerin, used to prevent set-off when backing-up sheets before printing, or for interleaving them after printing

Tyndall, John 1820–1893 An English physicist, noted for his experiments with light, sound and magnetism **T cone** The path of light passing through a heterogeneous medium, made visible by means of the solid particles, as, a sunbeam illuminating the dust particles of the air, or a light-beam passing into a colloidal suspension The cone-shape is due to an analogy of the focusing effect of a lens **T effect** The scattering of light by small particles, as in the T phenomenon **T phenomenon** A beam of light becomes visible when passing through a turbid solution, fog, or smoke Cf *scattering, luminescence, ultramicroscope*

tyndallimetry The estimation of the suspended matter in a solution by measuring the intensity of the scattered light from a Tyndall cone

type A general or prevailing character **t of compounds** An arbitrary classification of organic compounds which groups together those obtainable from one another by substitution, since they must belong to the same type More recently type has been used to indicate the presence of typical radicals, as, —OH, —NH_2, —CHO, —COOH, etc Type differs from class in that the latter refers to the carbon structure, (aliphatic, aromatic, saturated, unsaturated), whereas type indicates the possibility of certain common reactions due to typical radicals Cf *classification* **t metal** An alloy used for making printers' type It consists usually of about 7 parts lead and 2 parts antimony, with small amounts of tin, bismuth, nickel or copper **t reaction** A reaction which is common to a group of related substances

typhasterol A phytosterol from the pollen of *Typha orientalis*, a *Typhaceae* α- White powder, m 133, and levorotary

typhotoxin A ptomaine from cultures of Eberth's bacillus

typical Pertaining to a certain characteristic, property or standard **t compounds** Fundamental compounds from which a number of others are derived by substitution, as, H_2O HCl, NH_3, CH_4 **t elements** The most abundant element of each group of the periodic system, namely

Non-metals	oxygen and sulfur
	nitrogen and phosphorus
	carbon and silicon
	chlorine
	hydrogen

Metals	sodium and potassium
	magnesium and calcium
	aluminum
	iron
	copper
	zinc
	silver
	platinum
	gold
	mercury
	lead

tyramine $C_8H_{11}ON$ = 137 1 p-hydroxyphenylethylamine, aminoethylphenol $NH_2CH_2\text{-}CH_2C_6H_4OH$ An alkaloid obtained from ergot or by heating tyrosine A white crystalline powder, soluble in water, used medicinally as a heart stimulant and vasoconstrictor **t hydrochloride** $C_8H_{11}ON\,HCl$ = 173 5 A colorless crystalline powder, soluble in water, used medicinally as a substitute for pituitary extract

tyratol Thymol carbamate

tyroleucin $C_{14}H_{22}O_4N_2$ = 282 3 A split-product of casein or decomposing albumin

tyrolite Copper froth

tyrosal Salipyrine

tyrosinase An enzyme occurring in vegetable and animal tissues, that oxidizes tyrosine to homogentisic acid, melanin or similar pigments

tyrosine $C_9H_{11}O_3N$ = 181 14 β-p-hydroxyphenyl-α-aminopropionic acid, amino-hydroxyhydrocinnamic acid, $HOC_6H_4CH_2CH(NH_2)\text{-}COOH$ An optically-active amino acid occurring in d- (m 311) and l- (m 295) forms, obtained by hydrolysis of many proteins, it occurs in old cheese (The Greek word, tyros, means cheese) Silky needles, slightly soluble in water, alcohol or ether, used medicinally as an antidote for snake poisoning Its isomers are the **o-** (m 249) and **m-** (m 280) compounds Cf *erythrosin* **di-iodo-** A constituent of bath sponges and coral, a source of iodine

tyrosol $C_8H_{10}O_2$ = 138 1 *p*-Hydroxyphenethyl alcohol, $HOC_6H_4(CH_2)_2OH$ White rhombic crystals, m 93, b 310, formed during putrefaction or yeast fermentation of tyrosine

tyrosyl The monovalent radical, $HOC_6H_4CH_2\text{-}CHNH_2CO\text{—}$, derived from tyrosine

tyrotoxicon Tyrotoxin

tyrotoxin $C_6H_6ON_2$ = 122 1 Diazobenzene hydroxide, PhN N OH A ptomaine in stale milk, cheese or ice cream Golden-yellow needles, m 90, are produced with a solution of auric chloride

tysonite $(Ce,La,Di)F_3$ A native cerium, lanthanum, didymium trifluoride

U

U The symbol for (1) uranium, (2) intrinsic energy

u (1) An abbreviation for unit (2) The symbol for velocity component of ions

υ The Greek letter "upsilon"

Υ The Greek capital letter "upsilon"

ν See *nu*

μ See *mu*

uabain Ouabain

ucuhuba fat A fat extracted from the ground kernels of *Virola surinamensis*, a Myristicaceae of tropical America, d 0 90, m 47, $[\alpha]_D^{60}$ 1 450, iodine no 12

uintaite Gilsonite

ukambine An alkaloid from African arrow-poisons Its action is like that of strophanthin

ulexine $C_{11}H_{14}ON_2$ = 190 2 An alkaloid from the seeds of *Ulex europaeus* the common gorse of Europe It is a local anesthetic and powerful diuretic Cf *cytisine*

ulexite $NaCaB_5O_9\,8H_2O$ An hydrous sodium calcium borate, found in California

ullmannite NiSbS A native nickel sulfantimonide

ulmic acid $C_{20}H_{14}O_6$ = 350 1 Geic acid An acid from peat, elm sap and elm bark

ulmin $C_{40}H_{16}O_{14}$ = 720 1 A gum from the sap and bark of *Ulmus fulva*, slippery elm, an Ulmaceae **amin-** A gum found in coal, peat and decayed vegetable substances, formed by the action of amino acids on carbohydrates

ultimate Fundamental or basic **u analysis** Primary a The quantitative determination of each element in a compound without regard to molecular combination Cf *proximate* and *rational analysis* **u lines** See *rays ultimes* **u rational units** U R U A system of measurement based upon the charge of an electron, $(4\pi e)^2$, which has the dimension of energy × length and from which all other units may be derived (G N Lewis, Phil, Mag 45, 1923, p 266)

ultra- A prefix derived from the Latin "beyond," indicating that the substance or object concerned has values outside of certain limits

ultracentrifuge A high-speed centrifuge, used for determining the size and distribution of particles in ameroscopic colloids **McBain's-** A spinning rotor driven by and suspended in air, and attaining 350,000 revolutions per minute

ultrafilter See *filter*

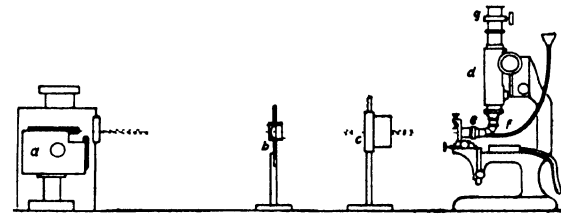
ultrafiltration Filtration under suction or pressure through a colloidal filter or semipermeable membrane It is used especially in colloid chemistry, in the preparation of colloidal solutions or suspensions, and for determining the size of the particles in terms of a standard ultrafilter whose pores are of known size

ultra-gamma rays Cosmic rays

ultramarine $Na_8Al_6Si_6S_2O_{12}$ Artificial lapis-lazuli A blue pigment, which consists essentially of sodium and aluminum silicates with sodium polysulfides **genuine-** Lapis-lazuli **synthetic-** A pigment prepared by melting clay, soda and sulfur or coal, used in paper and the textile industry as a pigment **yellow-** Barium chromate **u green** U having a green shade

ultramicron A particle less than $\frac{1}{4}$ of a micron in diameter, the smallest particles visible under the ultramicroscope

ultramicroscope Any microscope in which the object is brightly illuminated at right angles to the optical axis of the microscope Used to detect particles, smaller than 0 1μ, which reveal themselves as bright dots of light Cf *submicron micron, Tyndall cone*



Ultramicroscope
(Marshall, "Microbiology")

ultramicroscopic Beyond the range of microscopic visibility, but detectable by the ultramicroscope (q v)

ultraphonic Ultrasonic, supersonic Those air vibrations of high wave-length that are inaudible to the human ear Cf *infraphonic, phonic*

ultraphotic The invisible rays of the ultra-violet and infra-red regions

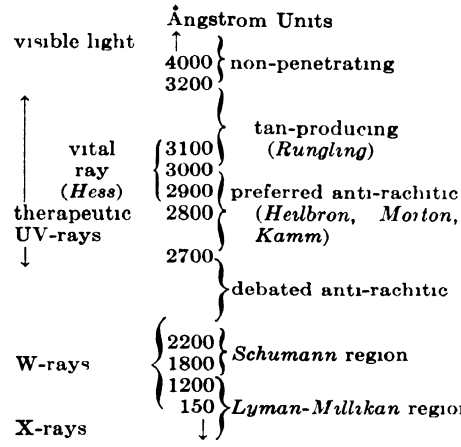
ultraquinine Homoquinine

ultra-red Infra-red

ultrasonic Ultraphonic

ultrathermometer Beckmann thermometer

ultra-violet That portion of the spectrum just beyond the violet on the short wave-length side, generally from 180–3,900 A U and emitted



by sunlight and the carbon arc mercury vapor, tungsten arc and Kromeyer lamps **far-** Rays of 180–2,900 Å U **near-** Rays of 2,900–3,900 Å U **vital-** Rays of 2,900–3,100 Å U Cf *radiation* **u rays** Invisible light rays from the ultra-violet region that induce chemical activity and produce fluorescence in many substances They act on the photographic plate, color p-phenylendiamine paper blue (sunlight does not) and produce a bright green fluorescence in willemite They are also supposed to have therapeutic properties, and will induce the formation of vitamins in sterols Cf *radiation, irradiation, uroxameter, fluorescence analysis*

ultra-x-rays Cosmic rays

umangite $CuSe\,Cu_2Se$ A native copper selenide Cf *berzelianite*

umbellaric acid $C_8H_{12}O_4$ = 172 09 The dibasic acid

$$CHMe\,CH(COOH)\,CH_2\,CH(COOH)\,CH_2$$

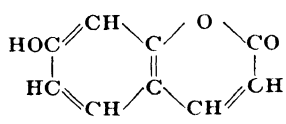
umbellic acid $C_9H_8O_4$ = 180 00 p-Hydroxycoumaric acid, dihydroxycinnamic acid, $(HO)_2C_6H_3CH\,CH\,COOH$ An acid obtained from umbelliferone by heating with sodium hydroxide A yellow powder, soluble in water, decomp 125

Umbelliferae Parsley family, a group of herbs with hollow stems and flowers having the shape of an umbrella Many of their seeds are used as spices or drugs, some yield common essential oils

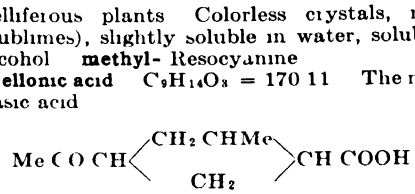
Fruits and Seeds	
Pimpinella anisum	anise
Foeniculum vulgare	fennel
Conium maculatum	poison hemlock
Carum carvi	caraway
Coriandrum sativum	coriander
Peucedanum (Anethum) graveolens	dill seed
Apium graveolens	celery seed apiol
Carum ajowan	ajowan
Petroselinum sativum	parsley seed
Oenanthe phellandrium	parsley seed
Oenanthe phellandrium	water hemlock
Cuminum cyminum	cumin seed
Daucus carota	carrot fruit
Roots	
Ferula sumbul	musk root, sumbul
Imperatoria ostruthium	masterwort
Laserpitium latifolium	white gentian
Levisticum officinale	lovage
Ligusticum filicinum	oshaic acid
Pastinaca sativa	parsnip root
Peucedanum officinale	peucedanin
Sanicula europea	sanicula
Petroselinum sativum	parsley
Angelica officinalis	angelica root
Pimpinella saxifraga	pimpinella
Cicuta virosa	water hemlock
Leaves	
Conium maculatum	hemlock leaves
Gum Resins	
Ferula foetida	asafetida
Ferula galbaniflua	galbanum
Dorema ammoniacum	ammoniacum
Ferula persica	sagapenum
Ferula sumbul	sumbul
Pastinaca opopanax	opopanax

Cf *aethusine, cynapine, crithmene, hentriacontane, mitsubaene*

umbelliferone $C_9H_6O_3$ = 162 1 4-Hydroxycoumarin A lactone in galbanum and umbelliferous plants Colorless crystals, m 223 (sublimes), slightly soluble in water, soluble in alcohol **methyl-** Resocyanine



umbellonic acid $C_9H_{14}O_3$ = 170 11 The monobasic acid



Cf *pinonic acid, umbellaric acid*

umbellulic acid $C_{11}H_{22}O_2$ = 186 17 Colorless crystals, m 23, b $_{160mm}$ 228, from California laurel Cf *cocinic acid, undecylic acid*

umbellulone $C_{10}H_{14}O$ = 150 1 A ketone from the oil of *Umbellularia californica*, a laurinaceous tree It is the chief constituent of California laurel oil, and readily changes to *thymol* by heating under pressure

umber Raw umber A native ferric hydroxide containing manganese dioxide and silicate, a dark brown to brownish-red powder, used as a pigment **burnt-** A warm reddish-brown pigment produced by heating raw umber

umbonate Describing a bacterical culture that has a button-like raised center

unary Composed of molecules which are physically and chemically identical, as opposed to associated or dissociated

uncertainty principle *Heisenberg* principle

undark A luminous paint containing traces of radioactive substances

undarken To make an article luminous in the dark by coating it with a luminous paint

undecalactone $C_{11}H_{20}O$ = 184 15 Peach aldehyde, C14 $Me(CH_2)_6CH(CH_2)_2CO\,O$ A white powder with strong aroma of peach

undecane $C_{11}H_{24}$ = 156 2 Hendecane* A saturated hydrocarbon of the methane series, $Me(CH_2)_9Me$ A colorless liquid, $d_{15°}$ 0 74, m −26, b 194, insoluble in water soluble in alcohol or ether

undecene Hendecene*

undecenoic acid Undecylic acid

undecenyl The monovalent, unsaturated radical $C_{11}H_{21}$— derived from undecylene

undecyl Hendecyl The monovalent radical $C_{11}H_{23}$—, derived from undecane

undecylene Hendecene*

undecylenic acid $C_{11}H_{20}O_2$ = 184 2 *9*-Hendecenoic acid* The unsaturated acid, $Me\text{-}CH\,CH(CH_2)_7COOH$ A colorless liquid or crystalline mass, d 0 907, m 24, b 295, soluble in water or alcohol

undecylic acid $C_{11}H_{22}O_2$ = 186 2 Hendecanoic acid*, $Me(CH_2)_9COOH$ A constituent of castor oil Colorless scales, m 28, b 212, soluble in water or alcohol Cf *umbellulic acid, cocinic acid* **cyclopentyl-** Hydnocarpic acid

u alcohol Hendecyl alcohol **u aldehyde** Hendecanal*

under Below normal **u cooling** Supercooling **u meter** Venturi meter **u voltage** The difference between the potential of a

positive hydrogen electrode and that of a reversible hydrogen electrode (Cf *overvoltage*)

undulate (1) To have a regular wave-like motion (2) Describing a bacterial growth with wavy borders and surface

undulation (1) A wave-like motion or vibration (2) The periodic expansion and contraction of bodies, as, steel rails

undung Laurel tallow A vegetable fat obtained from *Litsea* (*Tetranthera*) *laurifolia*, a Lauraceae of tropical Asia

unedol The reducing aglucone of unedoside

unedoside A glucoside from *Arbutus unedo* whose reducing power is decreased by hydrolysis, a unique property for a glucoside

ung An abbreviation for unguentum

unguentum (1) The Latin term for an ointment (2) A simple ointment

uni- A prefix derived from the Latin, indicating 'one" (Greek, mono-)

uniaxial (1) Having only one axis, as, of a crystal which does not doubly refract light (2) Having properties in one direction only, as along a particular axis of a crystal

unicellular Describing an organism that consists of a single cell, as, the protophyta and protozoa

unicorn A plant of the genus *Martynia* (Pedaliaceae) **false-** (1) Aletris (2) Chamaelirium (3) Helonias

unifrequent Describing a homogeneous beam of light or a radiation consisting of rays of similar wave-lengths

unimolecular Monomolecular (See *reactions*)

unionized Not ionized, existing in a non-dissociated molecular form

unit (1) A quantity used as a measure (2) A standardized equipment, which consists of a definite arrangement of devices, considered as a whole, as in a unit process **Angstrom-** See *Ångström* **Board of Trade-** (B T U) See *Board of Trade unit* **British Thermal-** See *British Thermal unit* **capacity-** Farad **c g s -, C G S** Metric units **derived-** See *derived units* **electrical-** See *electrical* **electromagnetic-** See *electromagnetic units* **electrostatic-** See *electrostatic units* **e m u -, E M U** Electromagnetic units **e s u -** or **E S U** Electrostatic units **fertilizer-** An u of plant food is 20 pounds, or 1 % of a ton of fertilizer **force-** The dyne **fundamental-** See *fundamental units* **heat-** Calorie **international-** U defined by international agreement, as, 1881 volt, ohm, ampere, coulomb, farad, 1889 joule, watt, 1893 henry, 1900 maxwell, gauss, 1930 gilbert, oersted **light-** See *candle, phot, lux* **metric-** q v **m k h -, M K H** Metric units expressed in terms of meter-kilogram-hour (Cf *c g s -units*) **quantum-** See *Planck's constant* **ultimate-** q v **u r u -, U R U** The ultimate rational units based, upon the charge of an electron **work-** The erg

univalent (1) Describing an element that has only one valency and forms only one series of compounds, as, Na, Mg, or Al Antonym polyvalent (2) Monovalent

universal General, applicable in all cases **u indicator** A pH-indicator (q v) which changes color over an extended range of pH values **u series constant** Rydberg's constant The value for N in the equations of the spectrum series It varies slightly for each element between the values

$$N_H = 109{,}677\ 691 \pm 0\ 06$$
$$N_{He} = 109{,}722\ 14 \pm 0\ 04$$
$$N_\infty = 109{,}737\ 11 \pm 0\ 06$$

unofficial Describing a drug that is not authorized by a pharmacopoeia or formulary

unorganic Inorganic

unorganized (1) Having no cellular or protoplasmic structure (2) Amorphous **u ferment** An enzyme that is active in sterilized solutions and is not dependent on cell-life for its action

unsatisfied Describing a hydrocarbon which has one or more free valencies Cf *free radical, unsaturated*

unsaturated (1) Not saturated, describing a solution that is capable of dissolving more solute (2) Describing an organic compound having double or triple bonds, as, ethylenes, acetylenes

unslaked lime Calcium oxide

unstable Readily decomposing, as, hydrogen peroxide, fulminates

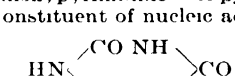
unsymmetrical Not symmetrical, as the 1 2 4-positions of the benzene ring

upas A Javanese arrow-poison containing strychnine (Malay = ipoh) **bohan-** A poisonous resin from the tree, *Antiaris toxicaria* of Java Cf *antiarin*

upsilon The Greek letter υ, Υ (see *u*)

uptake An exit pipe which leads in an upward direction

uracil $C_4H_4O_2N_2$ = 112 1 2 4(1 3) Pyrimidine dione, 2 6-dioxypyrimidine A pyrimidine base, m 338 a constituent of nucleic acids



methyl- Thymine

uraconite Uranic ocher

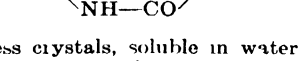
uralin $C_5H_8O_3NCl_3$ = 236 6 Chloral urethane, $CCl_3CH(OH)$ NH COOEt A colorless crystalline powder, soluble in water or alcohol, used as a hypnotic

uralite (1) A variety of amphibole found in the Ural Mountains (2) A fireproof substance, asbestos impregnated with sodium silicate and bicarbonate, and chalk

uralium A supposed element isolated by Guyard from platinum ores It has been given the atomic number, 75, and an atomic weight of 187 5, and is probably identical with rhenium

uramido Carbamido **u acetic acid** Hydantoic acid

uramil $C_4H_5O_3N_3$ = 143 1 Dialuramide, ammobarbituric acid, murexan,



Colorless crystals, soluble in water or alcohol, used in organic synthesis **thio-** See *thiouramil*

uramine Guanidine

uramino Carbamido

uranalysis Analysis of urine

uranate A salt of uranic acid of the general type, $M_2U_2O_7$

urane (1) A unit of radioactivity, the $\frac{1}{1000}$ part of a kilurane (2) Uranium oxide

uranic Describing a compound containing hexavalent uranium, as, uranium fluoride **u acid** H_2UO_4 = 304 2 A yellow, insoluble powder consisting of UO_3 in varying degrees of hydration The salts are derived from

the hypothetical acid, $2UO_3 \cdot H_2O$ or $H_2U_2O_7$ **u ocher** U_2O_3 Uraconite An amorphous, yellow native uranium oxide It contains radium **u oxide** UO_3 = 286 2 Uranium trioxide, uranic anhydride A yellow or orange powder, d 5 14, insoluble in water, soluble in acids Used in ceramics, and in the glass, paint, and textile industries

uranin $Na_2C_{20}H_{10}O_5$ = 376 2 Sodium fluorescein A brown powder and sodium salt of fluorescein used as a reagent

uraninite $UO \cdot U_2O_3$ Pitchblende Native uranium oxide, a source of radium

uranite A general term for a group of uranium minerals consisting of the phosphates of uranium with calcium or copper

uranium U = 238 07 A heavy metal and the last stable element of the periodic system, atomic number 92 Cf *transuranium, ekarhenium, ekaosmium* A hard, heavy, nickel-white metal, d 18 68, insoluble in water or alcohol, soluble in acids, m red heat It is radioactive, consists of several isotopes (q v), and disintegrates into a number of other elements (See *radioactive disintegration*) It forms several series of compounds corresponding with valencies of

+3, U^{+++} urinous	purple
+4 U^{++++} uranic	green
+6, UO_2^{--}, uranyl	yellow

The yellow oxide, UO_3, is amphoteric, and forms the "uranates" with bases and "uranyl" salts with acids **trans-** See *transuranium* **U_1, U_2, U_X** etc See *radioactive elements*

u A Fluorescein **u acetate** (1) Uranyl acetate (2) Uranyl-sodium acetate **u ammonium fluoride** Uranyl ammonium fluoride **u barium oxide** BaU_2O_7 = 725 8 Barium uranate An orange powder, soluble in acids **u. bromide** UBr_4 = 557 9 Uranic bromide Black leaflets, d 4 838, soluble in water or alcohol **u carbide** (1) UC_2 = 262 17 Solid, d 11 3, m 2260 (2) U_2C_3 = 512 34 Solid, d 11 28, m 2400 **u chloride** (1) UCl_4 = 380 0 Uranic chloride U tetrachloride Dark green, cubic crystals, soluble in water (2) UCl_3 = 344 51 Uranous chloride Purple, soluble crystals **u fluoride** UF_6 = 333 17 UF_3 and UF_4 also exist **u glass** A yellow glass with a green fluorescence which contains some uranium oxides **u hydroxide** $U(OH)_4$ = 306 15 A green, insoluble powder **u iodide** UI_4 = 745 9 Uranic iodide Yellow monoclinic crystals, m 500, soluble in water or alcohol **u lead** (1) Radium G (RaG) (2) A mixture of RaG and AcD See *lead* **u minerals** The ores of u are numerous and complex and contain the phosphates and vanadates of rare earths The principal ores (carnotite, uraninite or pitchlende, becquerelite, and autunite) are radioactive **u oxides**

U_2O_3	uranous oxide
UO_2	uranic oxide
UO_3	uranium trioxide
U_3O_4	uraninite
U_3O_8	uranyl uranate
UO_4	uranium tetroxide

u oxychloride Uranyl chloride **u sesquioxide** U_2O_3 = 524 4 A black insoluble powder **u strontium oxide** SrU_2O_7 = 676 0 Strontium uranate A yellow powder, soluble in acids **u sulfate** $U(SO_4)_2 \cdot 8H_2O$ = 574 5 Native as uranvitriol and zippeite Green monoclinic prisms, m 300, decomp by water **u sulfide** US_2 = 302 3 Uranous sulfide A gray powder, m 1100, insoluble in water, soluble in conc hydrochloric acid **u tetrachloride** U chloride **u tetrabromide** Uranium bromide **u trioxide** Uranic oxide **u X , u Y** See *radioactive elements* **u yellow** Sodium uranate Used as a pigment in ceramics and the glass industry **u Z** A short-lived isotope of ekatantalum, half-life period, 9 7 hours Cf *protoactinium*

uranocircite $(UO_2)_2BaP_2O_8$ A uranyl-barium phosphate

uranophane $U_2Si_2O_8 \cdot CaSi_2O_8$ A native uranium calcium silicate

uranospherite $U_2O_7(BiO)_2 \cdot 3H_2O$ A dull orange, scale-like mineral containing radium

uranospinite $(UO_2)_2CaAs_2O_8$ A native uranyl-calcium arsenate

uranous Describing a compound containing tetravalent uranium, as, uranium bromide, UBr_4 **u chloride** See *uranium chloride* **u oxide** UO_2 = 270 2 Uranium dioxide A black octahedral, crystalline powder d 10 95, m 2176, insoluble in water or alcohol, soluble in acids or alkalis **u uranic oxide** Uranyl uranate

uranvitriol Johannite A native uranium sulfate containing copper

uranyl The bivalent radical, $UO_2=$, derived from UO_3, it forms many salts with acids, these ionize to the positive ion, UO_2^{++}, and produce a yellow color in solution **u acetate** $UO_2(C_2H_3O_2)_2 \cdot 2H_2O$ = 424 3 Uranium acetate A yellow, crystalline powder, d 2 893, soluble in water or alcohol Used as a reagent and in volumetric analysis **u ammonium carbonate** $UO_2CO_3 \cdot 2(NH_4)_2CO_3$ = 522 3 Small, transparent, yellow crystals, soluble in water, used in ceramics and the glass industry for uranium glazes and glasses **u ammonium fluoride** $UO_2F_2 \cdot 3NH_4F$ = 419 3 Uranium ammonium fluoride A greenish, fluorescent, crystalline powder, soluble in water, insoluble in alcohol, used in x-ray screens **u benzoate** $UO_2(C_7H_6O_2)_2$ = 514 3 Uranium benzoate A yellow powder, slightly soluble in water, soluble in alcohol **u calcium phosphate** $(UO_2)_2Ca(PO_4)_2$ = 770 5 Greenish-yellow crystals, soluble in water **u chloride** UO_2Cl_2 = 341 1 Uranium oxychloride Yellow, hygroscopic crystals, soluble in water or alcohol It fuses and decomp if heated **u ferrocyanide** $(UO_2)_2Fe(CN)_6$ = 752 25 Uranyl-hexacyano ferrate A reddish-brown powder, insoluble in water It is produced by adding a ferrocyanide to uranyl salts **u formate** $UO_2(HCO_2)_2 \cdot H_2O$ = 378 17 Yellow octahedral crystals, d 3 695, slightly soluble in water **u hydroxide** $UO_2(OH)_2$ = 304 19 Uranic acid, H_2UO_4 A white solid **u nitrate** $UO_2(NO_3)_2 \cdot 6H_2O$ = 502 3 Uranium nitrate Yellow, deliquescent crystals, d 2 807, m 59, b 118, soluble in water, alcohol or ether Used as a reagent and indicator, medicinally as an antidiabetic, in ceramics, in the glass industry, and in photography **u. oxalate** $UO_2C_2O_4 \cdot 3H_2O$ = 412 2 Uranium oxalate A yellow powder, insoluble in water, soluble in acids **u oxide** Uranium trioxide **u phosphate** $UO_2HPO_4 + 4H_2O$ = 438 3 A yellow crystalline solid, insoluble in water or acetic acid **u potassium nitrate** $UO_2(NO_3)_2 \cdot 2KNO_3$ = 596 5 A greenish-yel-

low, crystalline powder, soluble in water **u potassium sulfate** $UO_2SO_4\ K_2SO_4$ = 540 5 A greenish-yellow powder, soluble in water **u sodium acetate** $UO_2(C_2H_3O_2)_2\ 2NaC_2H_3O_2$ = 552 3 Uranium sodium acetate, uranium acetate A yellow, crystalline powder, soluble in water or alcohol, used as a reagent **u sodium sulfate** $UO_2SO_4\ Na_2SO_4$ = 508 2 A yellowish-green crystalline substance, soluble in water **u sulfate** $2UO_2SO_4\ 7H_2O$ = 858 6 A yellow crystalline powder, d 3 28, soluble in water **u sulfide** UO_2S = 302 3 A brown powder, decomp by heat, slightly soluble in water **u uranate** U_3O_8 = 842 6 Uranous uranic oxide, $(UO_2)_2UO_4$ An olive-green, crystalline powder, d 7 31, decomp by heat, insoluble in water or alcohol, soluble in acids **u zinc acetate** A solution of u acetate and zinc acetate in acetic acid which gives crystals of characteristic shape with sodium salts

urao A native sodium carbonate and bicarbonate from South America

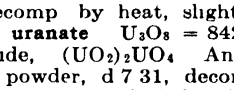
urari Curare

urase Urease

urasol $C_{19}H_{16}O_8$ = 372 1 Acetylmethylenedisalicylic acid, afsal, $CH_2[C_6H_3(COOH)OC_2H_3O]_2$ A yellowish powder, insoluble in water, soluble in alcohol or ether, used medicinally as an antiseptic

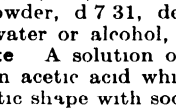
urate Lithate A salt of uric acid

urazine $C_2H_4O_2N_4$ = 116 0 Aminourazole The heterocyclic compound



Cf *diurea*

urazole $C_2H_3O_2N_3$ = 101 2 Hydrazodicarbonimide, diketotriazolidine



Colorless crystals, m 244, soluble in alcohol **amino-** Urazine **1-phenyl-** $C_2H_2O_2N_3Ph$ = 177 2 Colorless crystals, m 263 **3-phenyl-** Colorless crystals, m 203, soluble in alcohol **thio-** See *thiourazole*

Urbain, Georges 1872–1938 A French chemist noted for work on the rare earths

Ure, Andrew 1778–1857 A Scotch chemist noted as author (*A Dictionary of Chemistry*, 1821) and for technical methods **U eudiometer** A long U-shaped glass-tube closed at one end On the closed side are two electrodes and a graduated scale used to measure the volumes of gas mixtures

urea CH_4ON_2 = 60 1 Carbamide $NH_2\ CO\ NH_2 \rightleftharpoons NH_2\ CNH\ OH$ (pseudo u) A colorless tetragonal crystalline powder, d 1 323, m 132, decomp by further heat into biuret and ammonia, soluble in water, alcohol or ether It is the end-product of mammalian protein metabolism, the chief nitrogenous constituent of urine, and the first organic compound synthesized (Wohler, 1828) It forms addition compounds with salts Used as a reagent for detecting lignin, in pyrotechnics, and in organic synthesis Its derivatives are characterized by the prefix ureido-* or the suffix -urea*, as, butylurea*, $C_4H_9NHCONH_2$, butyryl urea*, $C_4H_9CONHCONH_2$ The bivalent radical—NH CO NH—is urylene* Cf *ureide, uramido* **ψ-** See pseudo *urea* **acetonyl-** See *acetonylurea* **acetyl-** See *acetonylurea* **alkene-** Compounds of the type RHN CO NHR, (urylenes), or $R_2N\ CO\ NR_2$ **allylthio-** Allysulfocarbamide **amino-** Semicarbazide **bi-** See *biurea* **bromoethylbutyryl-** Adaline **bromoisovaleryl-** Bromural **carbamido-** Biurea **carbamyl-** Biuret **carbonyl-** Triuret **cinnamyl-p-oxyphenyl-** Elbon **di-** See (1) *diurea*, (2) *urazine*, (3) *uril* **diamino-** Carbohydrazide **diphenyl-** Carbanilide **ethoxyphenyl-** Sucrol **ethylene-** Oxazoline (μ-amido) **guanyl-** See *guanyl urea* **hydroxy-** Derivatives of the compound, $NH_2\ CO\ NH\ OH$ **imino-** Guanidine **malonyl-** Barbituric acid **mesoxalyl-** Alloxan **oxalyl-** Parabanic acid **phenetyl-** Sucrol **phenylene-** Benzimidazolone **phenylhydrazine-** Diphenylcarbazide **propylene-** Oxazoline, (μ-amido-α-methylene-) **pseudo-** The tautomeric form of urea, NH_2-C NH OH **selen-** Selenurea **tartronyl-** Dialuric acid **thio-** Thiourea

u acetate A mixture of urea and acetic acid of varying composition **u apparatus** A device for the rapid determination of urea by the action of urease **u carboxylic acid** Allophanic acid **u citrate** $CH_4ON_2\ C_6H_8O_7$ = 252 2 Colorless, crystalline powder, soluble in water or alcohol **u hydrochloride** $CH_4ON_2\ HCl$ = 96 6 Colorless deliquescent crystals soluble in water Used medicinally, with quinine hydrochloride, as a local anesthetic **u nitrate** $CH_4ON_2\ HNO_3$ = 123 1 Colorless scales slightly soluble in water, used medicinally **u oxalate** $CH_4ON_2\ C_2H_2O_4$ = 150 1 Colorless crystals, soluble in water or alcohol **u quinate** $(CH_4ON_2)_2\ C_7H_{12}O_6$ = 312 3 Urol Colorless prisms, m 107, soluble in water, used medicinally **u quinine** Quinine and urea hydrochloride **u stibamine** NH_2-CO NH $C_6H_4\ SbO_3H\ NH_4$ A white powder used in the treatment of kala-azar

ureameter Ureometer An apparatus for determining the amount of urea in a liquid by measuring the volume of nitrogen evolved Cf *urinometer*

urease Urase A crystallizable enzyme occurring in numerous bacteria and fungi, and in Jack beans, that converts urea into ammonium carbonate A fine, nearly colorless powder, or white octahedra, soluble in slightly alkaline water, and giving a protein reaction (globulin) Its isoelectric point is pH 5 05 it is inactivated by metals, and contains 51–52 % C, 7 1 % H, 15 4 % N, 24 1 % O, 1 2 % S and 2 % ash, used as a reagent for determining urea Cf *uricase*

urechitin $C_{38}H_{42}O_8$ = 506 4 A glucoside from *Urechites suberecta*, the Savannah flower or yellow nightshade, an apocynaceous plant

urechitine $C_{24}H_{42}O_8\ H_2O$ = 476 4 An alkaloid from *Urechites suberecta*, an apocynaceous plant

urechitoxin $C_{13}H_{20}O_5$ = 256 2 A poisonous glucoside from *Urechites suberecta*, an apocynaceous plant

ureide (1) A derivative of urea, as,

$NH_2\ CO\ NHEt$	ethylurea
$NH_2\ CO\ NHCOMe$	acetylurea
$NH_2\ CO\ NH\ CO\ COOH$	oxaluric acid
$NH_2\ CO\ NH\ CO\ CO\ COOH$	alloxanic acid
$NH_2\ CS\ NH_2$	thiourea
$NH_2\ CO\ OEt$	urethane
$NHPh\ CO\ OEt$	euphorine

(2) A compound analogous to the amides, derived from carboxy acids and containing the

—NH CONH$_2$ radical, as, R CO NHCONH$_2$ **cyclic-** A compound formed by replacement of one H of each NH$_2$ group by a dibasic acid, as, in barbituric acid, alloxan **di-** A compound containing two ureido radicals **pseudo-** A compound of the type NH$_2$ CNH OR

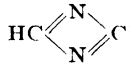
ureido (1) The bivalent radical, —NH CO-NH— (2) Carbamido

ureometer Ureameter

ureous acid Xanthine

-uret An obsolete suffix, indicating a binary compound of sulfur, arsenic phosphorus, carbon etc with some other element It is now superseded by the suffix -ide, as, sulfu*retted* hydrogen = hydrogen sulf*ide*

urete $C_2N_2H_2$ = 54 1 The heterocyclic compound



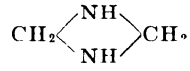
1 2-dihydro- Uretine **tetrahydro-** Uretidine

urethan A derivative of urethane, as, adalin, hedonal, neurodin, thermodin

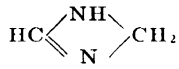
urethane $C_3H_7O_2N$ = 89 1 Ethylcarbamate, ethylurethan NH$_2$ CO OEt Colorless needles, d $_0^{0}$ 0 986 m 49, b 184 soluble in water alcohol or ether Used medicinally as a hypnotic and in organic synthesis **acetylethoxyphenyl-** Thermodin **acetyloxyphenyl-** Neurodin **amyl-** Amylcarbamate **chloral-** Uralin **ethyl-** Urethan **ethylchloral-** Somnal **ethylidene-** q v **phenacetin-** Thermodin **phenyl-** q v **piperidyl-** q v **thio-** q v **thymol-** Thymol carbamate **trichloro-** Voluntal

urethylan $C_2H_5O_2N$ = 75 05 "Methylurethane," methylcarbamate, NH$_2$ C O OMe A white, crystalline powder, m 52, b 177, soluble in water or alcohol

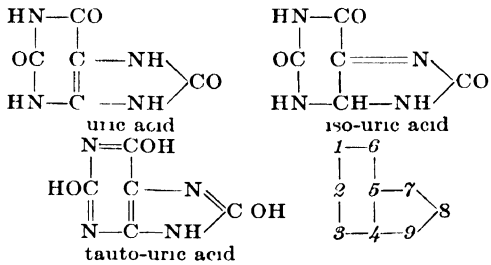
uretidine $C_3H_6N_2$ = 58 1 Tetrahydrourete



uretine $C_3H_4N_2$ = 56 1 1 2-dihydrourete



uric acid $C_5H_4O_3N_4$ = 168 1 Triketopurine 2 6 8-trioxypurine



uric acid iso-uric acid tauto-uric acid

Colorless scales, d 1 85, decomp by heat, slightly soluble in water Used in organic synthesis, and occurs in the body as the end-product of the purines of muscle and cell nuclei **iso-** An isomeric form of uric acid **tauto-** A tautomeric form of uric acid **trimethyl-** Caffeine Cf *purine derivatives*

uricase An enzyme in animal tissues, that splits uric acid to allantoin, urea and glycocoll It is destroyed by an excess of carbon dioxide Cf *urease*

uricoclastic Uricolytic

uricolytic Uricoclastic An enzyme that decomposes uric acid

uridin $C_9H_{12}N_2O_6$ = 244 13 Uracil-*d*-riboside, $C_4H_3N\ O_2\ C_5H_9O_4$ A nucleoside, m 150, from nucleic acid **u phosphoric acid** A nucleotide, m 202, from nucleo-proteins

uril A compound of the type RNH CO-NH NH C O NHR See *biurea*

urine A fluid secreted by the kidneys and discharged from the bladder Normally, a clear amber-colored liquid of slight acid reaction, d 1 005 to 1 030 Composition

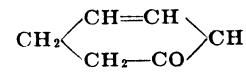
water	96 %
urea	2 3 %
sodium chloride	1 1 %
phosphates	0 2 %
sulfates	0 1 %
other organic compds	0 3 %

u analysis The qualitative and quantitative examination of urine It is of great diagnostic value, *e g* ,

		Normal
A	Physical characteristics	
1	Amount in 24 hours	1250–1500 cc (varies with food)
2	Specific gravity	1 015–1 025
3	Color	amber (pale straw to orange)
4	Transparency	clear
5	Odor	slightly aromatic
6	Consistency	aqueous
7	Reaction	faintly acid (or amphoteric)
8	Solids in 24 hours	60–65 grams
B	Chemical Characteristics	
	Inorganic constituents	25–30 grams per day
9	Chlorides	10–15 gm
10	Phosphoric acid	2 5–3 5 gm
11	Calcium phosphate	0 3–0 4 gm
12	Sulfuric acid	1 5–2 5 gm
13	Sulfates of Na, K etc	1 3–3 0 gm
14	Carbonates and Bicarbonates (in fresh alkaline urine)	varies
15	Iron	trace
16	Ammonia	trace
17	Carbonic acid	4 9 volumes
18	Oxygen	0 2–0 6 vol
19	Nitrogen	0 7–0 8 vol
	Organic constituents	35–40 grams per day
20	Urea	30–40 gm
21	Uric acid	0 7–1 0 gm
22	Hippuric acid	0 3–1 0 gm
23	Creatinine	0 5–1 0 gm
24	Acetone	trace
25	Mucus	trace

Abnormal constituents albumin, sugar, pus, blood, diacetic acid, indican, hydrogen sulfide Cf *urinometer, Haine's coefficient, Haeser's coefficient, Bang method, Benedict test, Cole's method, Ehrlich's solution, Trommer's test*

urinoid. C_6H_8O = 96 1 Cyclohexene-3-one A substance obtained from urine, which is



supposed to cause its characteristic odor

urinometer Urometer An hydrometer for determining the specific gravity of urine Cf *ureameter*

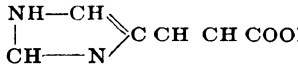
uritone A brand of hexamethylenetetramine

urobenzoic acid Hippuric acid

urobilin $C_{32}H_{40}O_7N_4$ = 592 36 Hydrobilirubin A bile pigment produced by the putrefaction of bilirubin in the gut and excreted in the kidney or removed by the liver A brown, resinous mass, soluble in alcohol, ether or chloroform, used as a reagent Cf *Ehrlich's solution*

urobromohematin $C_{68}H_{94}O_{26}N_8Fe_2$ A coloring matter in the urine of lepers, it is a derivative of hemoglobin

urocanic acid $C_6H_6O_2N_2$ = 138 1 Imidazoleacrylic acid The heterocyclic compound,



It is a ptomaine derived from histidine, and occurs in dog's urine White crystals, m 224, very slightly soluble in water Cf *urocaninic acid*

urocanin $C_{11}H_{19}ON_4$ = 223 19 A base in the urine of dogs

urocaninic acid $C_6H_6O_2N_2\,2H_2O$ = 174 2 An acid from the urine of dogs, decomp by heat to CO_2 and urocanin Cf *urocanic acid*

urochrome $C_{43}H_{51}O_{26}N$ = 997 5 A yellow coloring matter in urine (0 37–2 0 gm per day)

urochromogen A substance occurring in tissues, it is oxidized to urochrome

urocitral Theobromine sodium citrate

uroerythrin An orange-red pigment in urine

urol Urea quinate

urolith A calculus occurring in urine

uromelanin $C_{18}H_{43}O_{10}N_7$ = 517 6 A black pigment, which sometimes occurs in urine as a decomposition product of urochrome

urometer See *urinometer, ureameter*

uron A proposed name for the positive nucleus of an atom (See *proton, prouton*)

uronic acid A group of polyhydroxyaldehyde acids, CHO $(CHOH)_xCOOH$, derived from monosaccharides, made by oxidizing hexoses or pentoses whose aldehyde group is blocked (as in glucosides) *E g*,

penturonic acids	$CHO(CHOH)_3COOH$
as, arabinuric, ribosuric acid	
hexuronic acids	$CHO(CHOH)_4COOH$
as, glucuronic, galacturonic acids	
hepturonic acids	$CH(CHOH)_5COOH$

Their lactones are sometimes included in the definition, as, ascorbic acid

urophan A substance which, when taken into the body, appears again chemically unchanged in the urine

uropherine Theobromine lithium **u benzoate** Uropherine *B* Theobromine lithium benzoate **u salicylate** Theobromine lithium salicylate

uropittin $C_9H_{10}O_3N_2$ = 194 1 A resinous decomposition-product of urochrome

uroprotic acid $C_{66}H_{116}O_{54}N_{20}S$ = 2085 1 An acid protein from urine

uropterin A yellow pigment from the purine fraction of human urine

urosine $C_7H_{11}O_6Li$ = 198 09 Lithium quinate, $C_6H_7(OH)_4COOLi$, in a 50 % aqueous solution, used for gout

urotropine Hexamethylenetetramine **u quinate** Quinotropine **u salicylate** Saliformine **u tannin** Tannopin

uroxameter A mixture of 20 cc of a 2 % solution of oxalic acid, 5 cc of a 1 % solution of uranyl acetate, and 20 cc of water, used to measure the activity of a source of ultra-violet light

uroxanthin A yellow pigment of urine

ursanic acid $C_{30}H_{48}O_2$ = 440 4 A colorless acid, m 224, obtained by reduction and saponification of methylarsonate

ursin Arbutin

ursol p-Phenylenediamine

ursolene A dark grey wax, m 192, from cranberry skins At over 200° it hardens to a mass resembling montan wax

ursolic acid $C_{30}H_{48}O_3$ = 456 4 Urson, malol, prunol An unsaturated, monobasic hydroxy acid, $C_{29}H_{46}(OH)COOH_1$ in the wax covering the leaves of *Arctostaphylos uva-ursae* (bearberry), *Prunus serotina* (wild cherry) and the fruit of *Pyrus malus* (apple) A colorless powder, m 267, insoluble in water, soluble in alcohol, ether or chloroform

urson Ursolic acid

ursonic acid $C_{30}H_{46}O_3$ = 454 4 A ketonic acid whose methylester is obtained by oxidation of methylursolate

urstoff Protyle

urtica Stinging nettle The dried herb of *U dioica*, an Urticaceae It contains tannin and glucosides, used medicinally as a diuretic and hematinic

Urticaceae The nettle family, a group of plants including Moraceae, Ulmaceae and Cynocrambaceae, from which various drugs are obtained

Ulmus fulva	slippery elm bark
Ulmus compestris	elm bark
Humulus lupulus	hops
Cannabis sativa	Indian hemp
Urtica dioica	stinging nettle
Ficus carica	fig
Morus rubra	mulberry

See *ebul, fustic, morus, osage orange, ramie*

u r u or **U R U** An abbreviation for ultimate rational units Cf *c g s, e s u, e m u*

urunday A vegetable tanning agent

urusene $C_{15}H_{28}$ = 208 20 A hydrocarbon from urushi, Japanese lac, the secretion of *Rhus vernicifera*, an Anacardiaceae, the lacquer-tree Cf *rhus*

urushic acid $C_{23}H_{36}O_2$ = 344 28 Laccol An acid from the juice of the Japanese lac tree

urushiol $C_6H_3(OH)_2C_{15}H_{27}$ = 316 3 A pale, oily catechol derivative It occurs in *Rhus vernicifera*, and induces sensitiveness to poisoning

urycury oil An oil similar to and probably identical with babassu oil, q v

urylene The bivalent radical —NH CO NH— See *urea*, alkene *urea*

usnaric acid $C_{30}H_{22}O_{15}$ = 622 18 An acid from the lichen, *Usnea barbata*

usnic acid $C_{18}H_{16}O_7$ = 344 22 Usnimic acid An acid derived from *Usnea barbata*, a large lichen growing on forest trees A solid, levo-, m 190, dextro- m 195 Insoluble in water, soluble in ether, slightly soluble in alcohol

U S P or **U S Phar** An abbreviation for United States Pharmacopoeia (12th Edn, 1942)

ustilagine An alkaloid obtained from ustilago

ustilago Corn smut A mold-like fungus parasitic on maize, and resembling ergot It contains several alkaloids (ustilagine, secaline), used as an ergot substitute

utilities A proposed name for all useful minerals They are subdivided by M E Wadsworth into

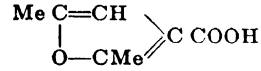
ceramites	fictile or ceramic materials
chalicites	binding or limes, cements
chemites	chemical raw materials
chromatites	color materials
coprites	fertilizers
ignites	pyrotechnic materials
lubricites	lubricating materials
metallites	metalliferous ores
pharmacites	medicinal minerals
pyrolites	refractory minerals
rholites	fluxes
salites	saline minerals
techtonites	building materials
thermites	fuel minerals
tribolites	abrasive minerals
vitrites	vitrifying minerals

U V Ultra-violet

uva Raisins **u ursi** Bearberry leaves The dried leaves of *Arctostaphylos uva-ursi*, an Ericaceae It contains arbutine, ericoline and urson, used medicinally as a tonic and diuretic

uvarovite $(CaO)_3Cr_2O_3Si_3O_6$ Uwarowite A calcium-chromium garnet

uvic acid $C_7H_8O_3$ = 140 06 Pyrotritartaric acid, dimethylfuranecarboxylic acid, uvinic acid,



Colorless needles, m 135, slightly soluble in water, soluble in alcohol or ether It is formed by the dry distillation of tartaric acid

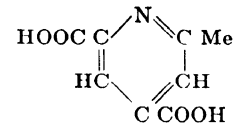
uvinic acid Uvic acid

uviol A glass which transmits ultra-violet light

uvitic acid $C_9H_8O_4$ = 180 06 Mesitic acid, 5-methyl-isophthalic acid, 5-methyl-benzene-1 3-dicarboxylic acid Me $C_6H_3(COOH)_2$ Colorless needles, m 287, insoluble in water, soluble in alcohol or ether **iso-** m 175, soluble in alcohol or ether insoluble in water

uvitinic acid $C_9H_8O_4$ = 180 06 Methyl phthalic acid $C_6H_3Me(COOH)_2$ White crystals, soluble in water

uvitonic acid $C_8H_7O_4N$ = 181 1 2-methyl-pyridine-4 6-dicarboxylic acid The heterocyclic compound,



A colorless crystalline powder, m 244, decomp 274

uvoflavin Vitamin B_2

uwarowite Uvarovite

uzara The powdered root of an African asclepiadaceous plant, used for diarrhea and bacillary dysentery

uzarin $C_{75}H_{108}O_{30}$ = 1488 86 A glucoside from uzara

V

V (1) The symbol for vanadium. An abbreviation for: (2) volt; (3) velocity; (4) volume; V_p = at constant pressure, V_t = at constant temperature.

v- An abbreviation for vicinal.

ν See *nu*.

υ See *upsilon*.

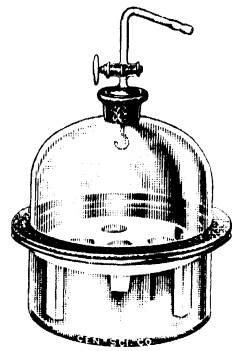
V.S. Abbreviation for volumetric solution.

vaccenic acid. $C_{18}H_{34}O_2$ = 282.0. An isomer of oleic acid, *trans*-octadecen-*11*-oic acid, in beef, mutton or butter fats.

vaccine. (1) A bacterial suspension used to produce active immunization by injection or inoculation. (2) The lymph from a cow-pox vesicle.

vaccinium. Whortleberry, European huckleberry. The dried herb and fruit of *Vaccinium myrtillus*, an Ericaceae, containing quinic acid, myrtillin and arbutin. Used medicinally as a diuretic.

vacuum. (1) Strictly, a space which contains no fluid. (2) Any space from which air or other gases has been completely or partly removed. Its presence is measured in relation to the air-pressure (760 mm.) and expressed in mm. of mercury.



Vacuum desiccator.

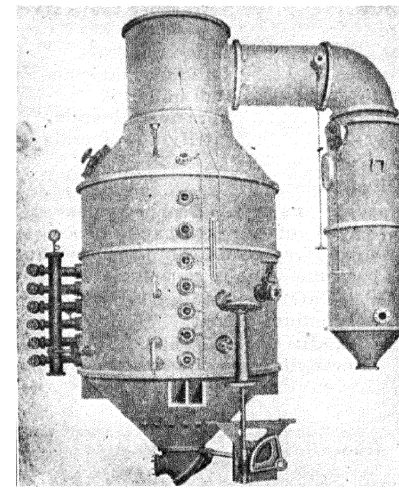
	mm. of Hg (relative)	mm. of Hg (absolute)
water pump	(760 − 7) = 753 mm.	7.00 mm.
Sprengel mercury pump		0.001 mm.
Geryk oil pump		0.0002 mm.
Toepler mercury pump		0.00001 mm.
Charcoal in liquid air		0.0000008 mm.
Gaede molecular pump		0.0000002 mm.

Other units and their equivalents are:

Atm.	mm. Hg	μ Hg	Bars
1	760	760,000	1.013569
0.00132	1	1000	1.333
0.0000013	0.001	1	1.333
0.00000099	0.00075	0.75	1

high- Rarefaction to a pressure below 0.01 mm., such as exists in x-ray tubes. **low-** A rarefaction from 50–1 mm. **Toricellian-** The vacuum in the portion of a barometric tube between the mercury and the closed top.

v. desiccator. An apparatus in which a substance is dried under reduced pressure (see illustration). **v. distillation.** Distillation under reduced pressure; used extensively in the chemical industry. **v. evaporation.** Evaporation in vacuo; as in a v. desiccator or v. pan. **v. fan.** A surface fan. **v. filter.** A device for filtration under reduced pressure or by suction. **v. gases.** (1) The gases obtained by heating solids (*e.g.*, metals) in a v. (2) The residual gas in a v. tube. **v. lamp.** See *lamp*.



Vacuum pan.

v. pan. A closed retort used in industry for vacuum distillation (see illustration). **v. pump.** A suction pump, especially those devices that exhaust air or other gases until a high vacuum is created. Most effective are those using mercury (Sprengel pump) or the phthalates (Hickman pump). V. obtained are:

hyvac pump	4×10^{-4} mm. Hg
megavac	1×10^{-4} mm. Hg
hypervac	5×10^{-5} mm. Hg
aristovac	3×10^{-7} mm. Hg

v. pump oil. An organic liquid used in place of mercury in v. pumps, especially in the Hickman pump. *E.g.*,

n-butyl phthalate	2×10^{-4} mm. Hg
n-amyl phthalate	2.5×10^{-5} mm. Hg
n-hexyl phthalate	3×10^{-6} mm. Hg
n-heptyl phthalate	2.5×10^{-7} mm. Hg
n- octyl phthalate	5×10^{-8} mm. Hg
n-ethyl hexyl phthalate	5×10^{-7} mm. Hg
benzyl phthalate	1.2×10^{-7} mm. Hg

v. still. A v. pan. **v. tar.** A tar obtained from coal by vacuum distillation. It is rich in aliphatic and aromatic hydrocarbons. **v. tube.** Any partly-exhausted, sealed, glass vessel that contains a gas at low pressure; used for the production of luminous electric discharges; as,

x-ray tubes, Crookes' tubes **v vessel** Dewar flask

vadose The ground water which extends only to a slight depth below the earth's surface In general, any water of surface origin, as rain, spring, well and ground water Antonym juvenile water, q v

valence (1) The capacity of an atom to combine with other atoms in definite proportions (2) Also applied by analogy to radicals and atomic groups Valence is measured with the combining capacity of a hydrogen atom taken as unity, thus

HCl	chlorine is monovalent
H_2O	oxygen is divalent
H_3N	nitrogen is trivalent
H_4C	carbon is tetravalent

Its value may be any integer from 1 to 8 (see value for each element under *periodic chain*) According to electronic concepts it is due to the "valence electrons," or the electrons located in the outer shell of an atom Cf *bond* This is illustrated for the first row of the periodic system as follows

Li Be B C N O F

where each dot represents a valence electron In general the electrons in compounds arrange themselves in groups of eight, thus

Li F Li O Li

Be O B N

A *positive* v indicates the number of electrons that an atom can *give* up, thus, Li = 1, Be = 2 A *negative* v indicates the number of electrons that an atom can *take* up, thus F = 1, O = 2 A *co-valence* indicates the number of pairs of electrons which an atom can share with its neighboring atoms According to some theories the two valencies of each element are of opposite sign (the normal- and contra-valencies), since every element has a total valence of 8, if the normal-valence is +x the contravalence is −(8 − x)

Any atom that gives or takes ONE electron is monovalent

Any atom that gives or takes TWO electrons is divalent

Any atom that gives or takes THREE electrons is trivalent

Any atom that gives or takes FOUR electrons is tetravalent

Any atom that gives or takes FIVE electrons is pentavalent

Any atom that gives or takes SIX electrons is hexavalent

Any atom that gives or takes SEVEN electrons is heptavalent

Any atom that gives or takes EIGHT electrons is octavalent

An element or its atom may exist in several stages of oxidation and thus form several corresponding series of compounds (q v), *e g* , ferrous and ferric, sulfurous and sulfuric Hence, an element whose atom exhibits

one valence is	univalent
two valencies is	bivalent
three valencies is	tervalent
four valencies is	quadrivalent
five valencies is	quinquevalent

See *Werner's coordination theory, bond* **active-** The commonest v of an element when the latter can exhibit more than one v **auxiliary-** Co-valence **chief-** (1) The maximum v which an element possesses (2) The v shown by the greatest number of stable compounds **co-** Auxiliary v The valence existing in the form of shared pairs of electrons between two molecules, as, NH_3—H_2O or NH_3—HCl It is opposed to electro v **contra-** Co-v **divided-** A bond which oscillates from one atom to another It is represented in structural formulas by a forked line, thus —< **electro-** See *electrovalence, polar bond* **free-** The v that appears to be unsatisfied, as in free radicals **maximum-** The highest stage of oxidation of an element **negative-** V due to an atom taking up electrons, as of chlorine **normal-** The v expressed according to the group of the periodic system **null-** Zero v No v , as in the case of the inert gases, which form no compounds **partial-** An unsaturated or divided v **principal-** The normal v of an atom or radical, as distinct from its residual v **positive-** V due to an atom giving up electrons, as, sodium **residual-** Supplementary-v The v by virtue of which complex compounds may be produced from apparently saturated molecules **rotating-** V due to oscillation of electrons between two atoms, as, the hydrogen between the two oxygen atoms in —COOH Cf *bond* **semi-** See *semi-valence* **supplementary-** Residual v

v bonds Any pair of electrons that consists of one electron from each of the two atoms they unite

Na—Cl or Na Cl

It is assumed that each bond consists of a pair of electrons in more or less rapid vibration If these vibrations are rapid the compound is colorless or emits ultra-violet rays, and if they are slow, the compound is colored Cf *bond, polar* **v electrons** The mobile electrons located outside the kernel or in the outer shell of an atom Atoms that lose these electrons become positive ions and atoms that gain these electrons become negative ions **v number** Polar number A negative or positive number that indicates the stages of oxidation of an element according to the number of electrons lost (positive) or gained (negative) It is determined from the formula of a stable compound by assuming that the sum of the v numbers is zero, and that hydrogen is always +1 and oxygen always −2, thus,

H O H, Na O H

1 + (−2) + 1 = 0 1 + (−2) + 1 = 0

or Na_2 S O_4

(2 × 1) (4 × 2)

2 + 6 + (−8) = 0

v tautomerism A dynamic isomerism in which the + and − charges produced by a moving double linkage are neutralized by the concomitant movement of a second double linkage, so that ions do not separate Cf *ionotropy*

valency The phenomena of valence

Valenta value The turbidity value (q v) of an oil with glacial acetic acid as solvent

Valentine, Basil See *Basil*

valentinite Sb_2O_3 White antimony A native antimony trioxide

valeral Valeraldehyde

valeraldehyde. $C_5H_{10}O$ = 86 11 Valeral, valeric aldehyde, amyl aldehyde, pentanal*, C_4H_9 CHO **normal-** $Me(CH_2)_3CHO$ A colorless liquid, d 0 819, b 103 4, slightly soluble in water, soluble in alcohol or ether **iso-** Me_2CH CH_2-CHO A liquid, d 0 8041, b 92, soluble in alcohol or ether, slightly soluble in water

valeramide $C_5H_{11}ON$ = 101 1 Valeric amide, pentanamide*, $Me(CH_2)_3CO$ NH_2 Colorless crystals, m 127, b 231, soluble in water, ether or alcohol

valerate Valerianate A salt of valeric acid, C_4H_9 COOM

valerene Amylene

valerian The dried rhizome of *Valeriana officinalis*, Valerianaceae It contains valerian, an essential oil, the bornyl ester of *iso*-valeric and other fatty acids, is used medicinally, as the fluid extract, as a nervine, an antispasmodic and stimulant **American-** Cypripedium **Japanese-** Kesso oil

v oil The volatile oil of v , a greenish liquid, d 0 990–0 996, b 250–300, containing borneol, bornyl formate, b acetate, pinene and camphene

valerianate Valerate

valerianic acid Valeric acid

valeric acid $C_5H_{10}O_2$ = 102 1 Valerianic acid, pentanoic acid* A group of isomeric, fatty acids in valerian *normal-* $MeCH_2$ CH_2 CH_2-COOH *iso-*, *common-* or isopropylacetic acid, Me_2CH CH_2 COOH, *dl-*, *dextro-* or *levo-* $MeCH_2$-CHMe COOH, trimethyl acetic acid (q v), CMe_3 COOH **normal-** A liquid, m −19, b 185, $d_{0°}$ 941 **common-** Isopropylacetic acid Pentoic acid A colorless liquid, d 0 942, m −51, b 186, soluble in water alcohol or ether It occurs in the essential oil of valerian used in perfumery and the manufacture of fruit ethers **dl-** Methylethylacetic acid, EtCHMeCOOH A colorless liquid, d 0 941, m −80, b 177, soluble in water **amino-** See *valine*, *norvaline* *homopiperidic acid* **aminoguanido-** Arginine **aminomethyl-** See *leucine*, *isoleucine* **diamino-** Ornithine **keto-** Levulinic acid **methyl-** Isocaproic acid **tetrahydroxy-** Arabic acid

v aldehyde Valeraldehyde **v anhydride** $C_{10}H_{18}O_3$ = 186 2 Pentanoic anhydride* The anhydride of valeric acid $(C_4H_9CO)_2O$ A colorless liquid, $d_{17°}$ 0 929, b 205, decomp by water to valeric acid

valeridin $C_{18}H_{19}O_2N$ = 221 2 Valeryl-p-aminophenetol, valerylphenetidine, sedatin valerydin, EtO C_6H_4 NH OC C_4H_9 Colorless needles, insoluble in water, soluble in alcohol or ether, used medicinally as a nervine and a sedative

Valerius Cordus 1510–1544 A German physician noted as the writer of the first legal pharmacopoeia *Dispensatorium pharmacorum omnium*, 1535

valerol $C_{18}H_{20}O_3$ = 284 2 A ketone obtained from the oil of valerian

valerolactone $C_5H_8O_2$ = 100 06 $MeCH$-$(CH_2)_2CO$ O A colorless liquid, b 220, in wood tar

valerone Diisobutylketone

valeronitrile Butyl cyanide

valerydin Valeridin

valeryl Pentanoyl* The monovalent radical, C_4H_9CO—, derived from valeric acid **v chloride** C_5H_9OCl = 120 53 Isovaleryl chloride pentanoylchloride*, Me_2 CH CH_2COCl A colorless liquid, d 0 989, b 114, decomp by water **v diethylamide** Valyl (2) **v. oxybutyrine** Quietol **v phenetidine** Valeridin

valerylene C_5H_8 = 68 1 Pentylene, *2*-pentyne*, methylethylacethylene An unsaturated hydrocarbon of the acetylene series, MeC CEt It is an isomer of pentinene, Me_2C C CH_2

validol $C_{16}H_{28}O$ = 236 2 Menthol valerate A colorless liquid, insoluble in water, soluble in alcohol or ether, used medicinally as a nerve sedative and stomachic

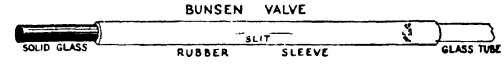
valine $C_5H_{11}O_2N$ = 117 1 Aminoisovaleric acid, *2*-amino-*3*-methylbutanoic acid*, Me_2CH-$CHNH_2$ COOH An amino acid from seeds and proteins It occurs in two steroisomeric forms, dextro- and levo-rotatory compounds **iso-** See *isovaline* **nor-** See *norvaline*

Vallets mass Ferrous carbonate mass

valonia The acorn cups of *Quercus aegilops*, a Fagaceae of Greece and Asia Minor, used for tanning

value A number expressing a property, as, acetylation v , acid v , heat v , iodine v , saponification v

valve A device for controlling the motion of a fluid along a passage It may be so arranged as to close or open an outlet by means of the pressure of the fluid flowing in a particular direction with a definite force **Bunsen-** A piece of rubber tubing with a short slit in the side A piece of glass rod is inserted in the rubber tube which is fitted to an exit tube, so that steam or air can escape but cannot re-enter



Contat-Gockel- A chemical v used in the cooling of acid solutions (*e g* , of iron), which are easily oxidized when hot A solution of sodium bicarbonate is drawn into the flask containing the acids, as it cools, and the CO_2 evolved prevents the entry of an excess of alkali **Fleming-** See *Fleming tube* **radio-** See *rectifier*, *vacuum tubes*

v effect Unilateral conductivity The phenomenon, shown by cells composed of certain electrodes and electrolytes, of conducting a current in one direction only Such cells can be used as rectifiers

valyl (1) $C_9H_{19}ON$ = 157 2 Valeric acid diethylamide valeryldiethylamide, $MeCH_2CH_2$-CH_2CONEt_2 A colorless liquid, slightly soluble in water, soluble in alcohol or ether, used medicinally as a sedative and antispasmodic (2) The monovalent radical, Me_2CH $CHNH_2$-CO—, derived from valine

valzin Sucrol

vanadate A salt of vanadic acid of the general type, M_3VO_4 **meta-** A salt of the type, MVO_3 **ortho-** Vanadate, M_3VO_4 **pyro-** A salt of the type $M_4V_2O_7$

vanadic Describing a compound containing tri- or pentavalent vanadium, as, VCl_3 or V_2O_5 **v acid** HVO_3 = 100 0 *meta-* Golden-yellow scales, slightly soluble in water, soluble in alcohol or ether, used as an oxidizing agent, and medicinally, as an antiseptic *ortho-* H_3VO_4 = 118 0 A yellow powder, slightly soluble in water *pyro-* $H_4V_2O_7$ = 218 0 An amorphous, brown powder, slightly soluble in water, soluble in alcohol or ether **v anhydride** Vanadium pentoxide **v salts** See *vanadium*

vanadinite $PbCl_2$ $3Pb_3(VO_4)_2$ A native lead chloride and lead vanadate

vanadite (1) A salt of the type of $M_2V_4O_9$ from vanadous acid (2) Vanadinite

vanadium V = 50 95 A rare metal and element, atomic number 23, discovered in 1830 by Sefstrom It occurs in the blood of ascidians It is a light gray metal, d 5 69, m 1720, insoluble in water or alcohol, soluble in acids Vanadium has valencies of, 2, 3, 4, and 5, and forms, accordingly, several series of compounds It is distinctly amphoteric, giving basic salts (vanadyl compounds) and acid salts (vanadates) These ions impart various colors to its solutions

valence number	ion	name	color
2	V^{++}	vanadous	violet
3	V^{+++}	vanadic	green
	VO^{+}	vanadyl (ous)	bluish-gray
5	VO_4^{---}	ortho vanadate	yellow
	VO_3^{-}	meta vanadate	yellow
	VO^{+++}	vanadyl (ic)	blue

Vanadium is used in metallurgy, (*e g*, as ferrovanadium in the manufacture of steel), and in the preparation of catalysts It resembles tantalum, and can be cold-worked into wire The world output in 1940 was 3,500 long tons, from Peru > U S > Southwest Africa > Northern Rhodesia

v bromide VBr_3 = 290 71 A dark green amorphous powder, which readily dissolves and decomp in water **v carbides** (1) VC = 62 96 A black crystalline mass, d 5 36, m 2830, insoluble in acids, except nitric acid (2) V_4C_3 = 239 84 **v chlorides** three chlorides (1) VCl_2 = 121 9 V dichloride, vanadous chloride Violet hexagonal crystals, d 3 28, soluble in water or alcohol (2) VCl_3 = 157 4 Vanadic chloride, v trichloride A green, crystalline powder, d 3 0, soluble in water or alcohol (3) VCl_4 = 192 8 V tetrachloride A red liquid, d 1 865, m −15, b 154, soluble in water, alcohol or ether **v dichloride** See *v chloride* (1) **v difluoride** See *v fluoride* (1) **v dioxide** (1) V_2O_2 = 134 0 A light-gray, crystalline powder, d 3 64, insoluble in water, alcohol or ether, soluble in acids or alkalis, producing a lavender-blue solution which has strong reducing powers Cf *v monoxide* (2) VO_2 See *v tetroxide* **v dioxymonochloride** Vanadyl chloride **v disulfide** V_2S_5 = 166 05 A black powder, d 4 2, insoluble in hydrochloric acid, soluble in sulfuric acid **v fluorides** (1) VF_2 = 89 0 Vanadous fluoride, v difluoride Insoluble, except in HF (2) VF_3 = 107 96 Vanadic fluoride, v trifluoride A green crystalline powder, d 3 363, m about 800, insoluble in water (3) $VF_3 3H_2O$ = 162 01 Rhombohedral crystals, readily soluble in water (4) VF_4 = 126 96 V tetrafluoride A yellow, hygroscopic crystalline powder, d 2 975, decomp 325, soluble in water or acetone (5) VF_5 = 145 96 V pentafluoride A liquid, d 2 177, b 111, soluble in water or alcohol **v hydroxides** (1) $VO\ xH_2O$, or $V(OH)_2$ Vanadous hydroxide A violet-gray powder, insoluble in water or sodium hydroxide, soluble in acids (2) $V_2O_3\ xH_2O$ or $V(OH)_3$ Vanadic hydroxide A green powder, insoluble in water, soluble in acids **v minerals** Vanadium is widely diffused, and occurs in small quantities as a constituent of rocks, clays and coals

vanadinite	$Pb_5V_3O_{12}Cl$
sulvanite	Cu_3VS_4
carnotite	Uranium vanadate
descloizite	$4(Pb, Zn)O\ V_2O_5\ H_2O$
patronite	V_2S_3

Cf *roscoelite, volborthite* **v monosulfide** VS See *v disulfide* **v nitride** VN = 64 97 A solid, d 5 63, m 2050, insoluble in water, acids or alkalis **v oxides** oxides

VO or V_2O_2	v monoxide, vanadous oxide
V_2O_2	v dioxide
V_2O_3	v trioxide, vanadic oxide, v sesquioxide
V_2O_4 or VO_2	v tetroxide
V_2O_5	v pentoxide, vanadic anhydride

In addition there are the positive ions

VO^{++}	vanadyl (ous) or vanadyl
VO^{+++}	vanadyl (ic) or pervanadyl
VO_2^{+}	vanadol

v oxybromide Vanadyl bromide (1) **v oxychloride** Vanadyl chloride (2) **v oxydibromide** Vanadyl bromide (2) **v oxydichloride** Vanadyl chloride (3) **v oxydifluoride** Vanadyl fluoride (1) **v oxyfluoride** Vanadyl fluoride (2) **v oxytribromide** Vanadyl bromide (3) **v oxytrichloride** Vanadyl chloride (4) **v pentoxide** V_2O_5 = 182 0 Vanadic oxide, vanadic anhydride A yellowish or red crystalline powder, d 3 357, m 656, soluble in hot conc acids, a strong oxidizing agent **v pentafluoride** V fluoride (5) **v pentasulfide** V_2S_5 = 264 2 Vanadic sulfide A green powder, d 3 0, slightly soluble in alkalis, soluble in acids **v sesquioxide** V trioxide **v sesquisulfide** V trisulfide **v silicides** (1) V_2Si = 129 98 Silver-white prisms, d 5 48, insoluble in water, acids or alkalis (2) VSi_2 = 107 08 Metallic prisms, d 4 42, insoluble in water, alkalis or acids **v steel** An alloy of iron and 0 1 to 0 15 % vanadium, used in the manufacture of tools **v sulfate** Vanadyl sulfate **v sulfides** V_2S_2, vanadium disulfide, V_2S_3 (vanadous) vanadium trisulfide, V_2S_5 (vanadic) vanadium pentasulfide **v tetrachloride** V chloride (3) **v tetrafluoride** V fluoride (4) **v tetroxide.** V_2O_4 = 165 9 Vanadous acid An indigo-blue, crystalline powder, d 4 399, m above 1750, insoluble in water, soluble in acids or alkalis **v trichloride** See *v chloride* (2) **v trifluoride** See *v fluorides*, (2) and (3) **v trioxide** V_2O_3 = 149 92 V sesquioxide, vanadous oxide A black, infusible, crystalline powder, d 4 87, m 1970, slightly soluble in water, soluble in alkalis or halogen acids It changes slowly in air to the indigo-blue oxide, V_2O_4, used as a mordant in dyeing, as a catalyst, and in the manufacture of steel and of silver vandate, Ag_3VO_4 **v trisulfide** V_2S_3 = 198 2 Vanadous sulfide A dark-red, crystalline powder, d 3 85, insoluble in water, soluble in nitric acid or ammonium sulphate solution

vanadol The radical VO_2^{+}

vanadous Describing a compound containing di- or trivalent vanadium, as, VCl_2 or V_2O_3 **v acid** $H_2V_4O_9$ The hypothetical compound from which vanadites are derived, $M_2V_4O_9$ **v chloride** Vanadium chloride (1) **v fluoride** Vanadium fluoride (1) **v hydroxide** Vanadium hydroxide (1) **v oxide** Vanadium trioxide **v sulfide** Vanadium trisulfide

vanadyl (1) The trivalent radical, VO ≡ vanadyl(ic), derived from pentavalent vanadium, (vanadic) (2) The monovalent radical, VO— vanadyl(ous), derived from trivalent vanadium (vanadous) **di-** The tetravalent V_2O_2 ≡ radical **v bromides** (1) VOBr = 146 87 V-ous bromide, vanadium oxybromide A solid, d 4 00, decomp 480, slightly soluble in water (2) $VOBr_2$ = 226 79 V dibromide, vanadium oxydibromide A brown, hygroscopic powder, soluble in water (3) $VOBr_3$ = 306 7 V tribromide, v-ic bromide, vanadium oxytribromide A red liquid, d 2 933, readily soluble in water (decomp) **v chlorides** (1) V_2O_2Cl = 169 4 V semichloride, vanadium dioxymonochloride Yellow crystals, d 3 6, insoluble in water (2) VOCl = 102 4 V monochloride, v-ous chloride, vanadium oxymonochloride A brown powder, d 2 8, insoluble in water, soluble in acids (3) $VOCl_2$ = 137 8 V dichloride, vanadium oxydichloride Blue scales, d 2 88, deliquescent and slowly decomposed by water (4) $VOCl_3$ = 173 3 V trichloride v-ic chloride, vanadium oxytrichloride Dark green syrupy liquid, d 1 836, m −15, b 127, soluble in alcohol or water It is used as a mordant in the dyeing industry **v dibromide** See v bromide 2 **v dichloride** See v chloride 2 **v bromide 2** See v chloride 3 **v difluoride** See v fluoride 1 **v fluoride** (1) VOF_2 = 104 96 V difluoride, vanadium oxydifluoride A solid, d 3 396, decomposed when heated, insoluble in water (2) VOF_3 = 123 96 V trifluoride, v-ic fluoride A solid, d 2 459, m 300, very soluble in water **v monobromide** V bromide 1 **v monochloride** V chloride 2 **v semichloride** V chloride 1 **v sulfate** $(VO)_2(SO_4)_3$ = 422 2 A blue crystalline powder, soluble in water and decomposed by alcohol *di-* $(V_2O_2)(SO_4)_2$ = 326 0 A double salt of v sulfate **v tribromide** V bromide 3 **v trichloride** V chloride 4 **v trifluoride** V fluoride 2

vanadylic The trivalent radical, ≡VO **v bromide** Vanadyl bromide 3 **v chloride** Vanadyl chloride 4

vanadylous The monovalent radical, —VO **v bromide** Vanadyl bromide 1 **v chloride** Vanadyl chloride 2

van der Waals, Johanns Diderik Vander Waals 1837–1923 A Dutch chemist noted for his contributions to physical chemistry **van der W constant** The factors, *a* and *b*, in the equation of state (q v) **v d W equation** A modification of the equation of state in which two correcting factors are introduced $(p + a/v^2)(v - b) = RT$, in which the volume factor *b*, corresponds with four times the square root of the space occupied by the molecules themselves, and the factor, a/v^2, expresses the mutual attraction of the molecules for each other See *corresponding states* **v d W forces** The weak forces between atoms and molecules which cause crystallization of inert gases at low temperature, and the packing together of nonpolar organic compounds to form soft crystals of low melting point

van Dyck brown Vandyke A mixture of ocher and lamp black

van Helmont See *Helmont*

Vanier's tube An absorption device consisting of a potash bulb and drying tube, used to absorb the CO_2 evolved in the determination of carbon in steel by the combustion method

vanilla Vanilla bean The cured and full-grown, unripe fruit of *Vanilla planifolia*, an Orchidaceae It contains vanillin and vanillic acid, used medicinally as an aromatic and in the manufacture of chocolate, confectionery, flavoring extracts and perfumery

vanillal The bivalent radical, (3,4)(MeO)(HO)-C_6H_3, CH=, derived from vanillin

vanillic acid $C_8H_8O_4$ = 168 1 3-Methoxy-4-hydroxybenzoic acid, MeO C_6H_3(OH)COOH Colorless needles m 207 (sublimes), slightly soluble in water, soluble in alcohol or ether **v alcohol** $C_8H_{10}O_3$ = 154 1 3-Methoxy-4-hydroxybenzyl alcohol, MeO C_6H_3 OH CH_2OH Colorless needles, m 115, decomp by further heat, soluble in water, alcohol or ether

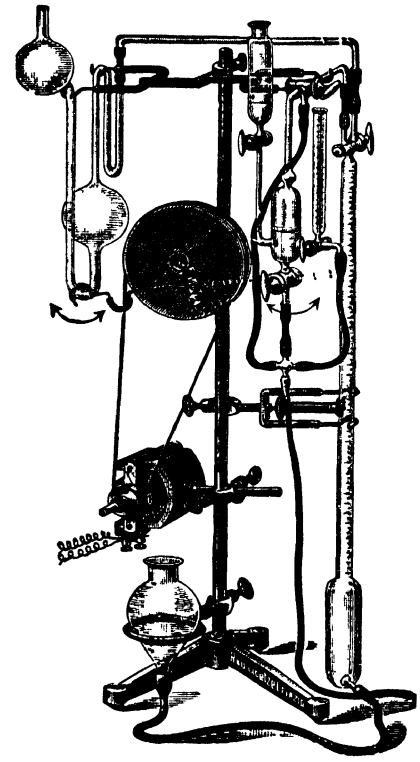
vanillin $C_8H_8O_3$ = 152 1 Methylprotocatechuic aldehyde, 3-methoxy-4-hydroxy benzaldehyde, MeO C_6H_3(OH)CHO An odorous principle from the vanilla bean, or prepared synthetically Colorless needles, m 80 (sublimes), slightly soluble in water, soluble in alcohol, ether or glycerol Used as a reagent, and as a flavoring agent and vanilla substitute **ethyl-** $C_9H_{10}O_3$ = 166 08 *m*-Ethoxy-*p*-hydroxy benzaldehyde, bourbonal A homologue of vanillin, four times as strong in flavor Cf *ethyl vanillate* **iso-** See *isovanillin*

vanilloyl The monovalent radical, (3,4)(MeO)-(HO)C_6H_3CO—, derived from vanillic acid

vanillyl The monovalent radical, (3,4)(MeO)-(HO)$C_6H_3CH_2$—, derived from vanillic alcohol **v alcohol** Vanillic alcohol

vanirom Bourbonal

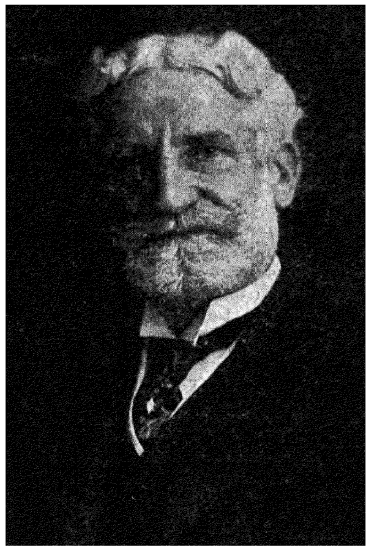
van Laar, J J 1860– A Dutch chemist and coworker of van't Hoff and van der Waals



Van Slyke apparatus
(Hawk's "Practical Physiological Chemistry")

vanning. The mechanical separation of the constituents of an ore by washing away the lighter portions in a stream of water.

Van Slyke, Donald Dexter. 1883– . An American chemist noted for his work on biochemical analysis. **V. S. apparatus.** A setup of chemical glassware for the determination of aliphatic amino-nitrogen in proteins. **V. S. method.** The measurement of the nitrogen gas evolved from aromatic amino compounds and nitrous acid: $R.NH_2 + HNO_2 \rightarrow R.OH + N_2 + H_2O$. It is used in biochemical analysis for the determination of proteins.



Lucius Lincoln Van Slyke.

Van Slyke, Lucius Lincoln. 1859–1931. An American chemist noted for research in the chemistry of dairy products.

van't Hoff, Jacobus Henricus. 1852–1911. A Dutch chemist noted for his work on stereochemistry and the theory of solutions. Nobel Prize winner in 1901. **v. H.'s factor.** The empirical factor, i, in the equation of state when applied to solutions: pv = iRT, where p is the osmotic pressure and v the volume. The factor i depends on the dissociation of the compound; if the molecules are completely ionized, i is 2 for binary and 3 for ternary compounds. If d is the degree of ionization and n the number of ions into which a molecule is partly dissociated, i = 1 + d(n − 1). **v. H.'s law.** The osmotic pressure exerted by a solute in solution is the same as it would be for the same solute in the state of an ideal gas occupying the same volume as was occupied by the solution. **v. H. solution.** A solution of 2 gm. $CaCl_2$, 2.2 gm. KCl, 7.8 gm. $MgCl_2$, 3.8 gm. $MgSO_4$ and 100.2 gm. NaCl in 1000 cc. water. **v. H. theory.** Dissolved substances obey the gas laws.

Jacobus Henricus van't Hoff.

(From Brownlee, Fuller and Hancock "Elementary Chemistry." Courtesy of Allyn & Bacon.)

vanthoffite. $MgSO_4.3Na_2SO_4$, a Stassfurt salt.

vapodust. An insecticide spray consisting of vaporized petroleum oils; used, in the form of a fog, in orchards.

vapor, vapour. A gas, especially the gaseous form of a substance that at ordinary temperature is a solid or liquid; as, iodine-v., ether-v. It is the state or phase into which a substance passes when its v. pressure equals that of the atmosphere. **saturated-** A vapor is saturated when liquid in it and from which it is derived cannot further evaporate; that is, the same number of molecules which escape from the liquid into the gas, are condensed from the gas to the liquid, and an equilibrium is set up dependent on temperature only. **unsaturated-** A vapor contained in a space in which there is insufficient liquid to saturate it.

v. bath. Steam bath. **v. density.** The density of a gas compared with some gas as a standard. Three standards:

(a) hydrogen, as 1..... $D_{(H_2=1)}$
(b) oxygen, as 16..... $D_{(O_2=16)}$
(c) air, as 1..... $D_{(air=1)}$

The relationship of these three standards is: a = M/2; b = M; and c = M/28.95; where M is the molecular weight of the substance, the data being corrected for pressure and temperature by the equation of state, q.v. **v. pressure.** The pressure at which a liquid and its vapor are in equilibrium at a definite temperature. If the v.p. reaches the prevailing atmospheric pressure (1 atm.) the liquid boils (boiling point). Cf. *Babo's law, Clausius equation, Wullner's law.* **v. tension.** The tendency of a liquid to form a vapor. It is assumed that the molecules of a liquid are in motion; those moving fastest are expelled from the liquid and become molecules of gas, and vice versa, thus, establishing an equilibrium between the number of molecules in the gas and in the liquid which depends upon the prevailing temperature and pressure.

vaporimeter. An instrument in which the volatility of lubricating or other oils is tested by heating them in a current of air.

vaporization. Volatilization. The change from the liquid to the gaseous state without any change in the chemical composition of the molecule. Cf. *evaporation.* **heat of-** The number of calories required to transform one gram of liquid substance, at its boiling point, into its vapor. Cf. *Clausius equation.*

vaporize (1) To change into a vapor, *e g*, by heating a liquid (2) To atomize, or subdivide a liquid into a fine spray

vaporizer (1) An atomizer (2) A still

varek A French term for kelp

variability The deviation from the normal or standard Cf *variance*

variable A factor that is not constant, but changeable

variance Degree of freedom The number of external conditions which may be arbitrarily fixed, as, composition, temperature, and pressure See *phase rule, freedom, variability*

variant Pertaining to variable factors **di-** An area in a diagram, q v **mono-** A line in a diagram **non-** A point in a diagram Cf *phase rule*

variscite $AlPO_4 2H_2O$ Peganite A green aluminum phosphate, sometimes used as a gem

varnish A solution of a resin or drying oil in a volatile solvent (*e g*, alcohol or turpentine) See *lacquer*

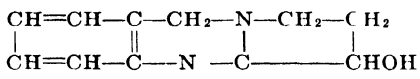
Varrentrapp, Franz 1815–1877 A German chemist, noted for analytical methods

varve A lamination in a deposit of natural clay

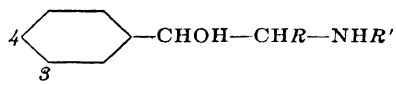
vasculose An early name for impure lignin, m 211, (decomp), slightly soluble in water, soluble in alcohol or chloroform

vaselin Fossolin A mixture of hydrocarbons of the paraffin series obtained from the residues of petroleum See *petrolatum*

vasicine $C_{11}H_{12}N_2O$ = 188 11 An alkaloid from *Peganum harmale* or *Adhatoda vasica*, an Acanthaceae, white needles, decomp 198, used as an insecticide



vasoconstrictor A vasomotor stimulant or agent that increases arterial pressure by the constriction of the blood vessels, as, epinephrine, ergot, cocaine, tyramine, and



	R	*R'*	*3*	*4*
ephedrine	CH_3	CH_3	H	H
synephrine	H	CH_3	H	OH
neosynephrine	H	CH_3	OH	H
epinephrine	H	CH_3	OH	OH
cobefrine	CH_3	H	OH	OH

vasodilator A vasomotor depressant, or agent that lowers the arterial pressure by the dilation of the blood vessels, as amyl nitrite nitroglycerin, veratrum, aconitine

vasopressin β-Hypophamine

vat (1) A vessel or tub in which colors are dissolved or ores are washed and subjected to chemical treatment, as, indigo-vat or cyanide-vat (2) The solutions used in these tubs, *e g*, zinc-lime vat (10 pts indigo, 10 pts zinc dust, 30 pts lime), sulfate-vat (10 pts indigo, 50 pts ferrous sulfate, 60 pts lime) **v dye** A color that is applied with a mordant See *dyes*

vaterite μ-$CaCO_3$ A probable anisotrope of calcite, d 1 254

Vaughan's cage An iron-screen box that is collapsible and can be sterilized, used in animal experiments

Vauquelin, Louis Nicolas 1763–1829 A French chemist, the discoverer of chromium and organic compounds, and a pioneer in teaching laboratory work

vauqueline Strychnine

vauquelinite $2PbO\ CuO\ 2CrO_3$ A native mixed oxide of lead, copper and chromium

vector A magnitude (such as velocity, force, momentum, induction etc) which has both, magnitude and direction, and which may be represented as a straight line of suitable length and direction Cf *co-ordinates, scalar molecular diagram*

veepa oil Margosa oil

vegetable Pertaining to plants, q v **v dyes** Coloring materials obtained from plants, as, chromoproteins, indicators, cyanins, carotenes, plant pigments **v horsehair** See *horsehair* **v parchment** An imitation parchment used widely for wrapping foodstuffs, and prepared by passing paper through a bath containing sulfuric acid or a solution of zinc chloride **v potash** A fertilizer made from distillery waste (33 % K_2O)

vehicle A usually-inactive substance serving as a medium or carrier for an active substance, as oil in paints (cf *thinner*)

vein (1) A blood-vessel that conveys blood towards the heart (2) A lode or deposit of ores distinct from the surrounding rocks

vellosine $C_{23}H_{28}O_4N_2$ = 396 3 An alkaloid from the bark of *Geissospermum vellosii*, or pareira bark Pale yellow crystals, m 189, insoluble in water, soluble in alcohol or ether

velocity (1) The speed with which an object travels expressed as the distance covered by it during a certain unit interval of time $v = L/T$ (2) The time required for a phenomenon to take place, as, v of reaction Cf table, for magnitudes of velocity **angular-** q v **migration-** q v **molecular-** q v **reaction-** q v **terminal-** The velocity acquired by a freely-falling body when the resistance of the medium through which it falls balances the weight of the particle

v constant The constant of the velocity of reaction (q v)

MAGNITUDES OF VELOCITY

Light	186,000	miles per sec	$2\ 99 \times 10^{10}$ cm /sec
Electrons in cathode rays			10^9 to 10^{10}
Alpha-particles, initial velocity	20,000	miles per sec	$3\ 2 \times 10^9$
Farthest spiral nebula (recession)	12,300		2×10^9
Sun around hub of Milky Way	200		3×10^7
Mercury around sun	29 7		$4\ 78 \times 10^6$
Earth around sun	18 33		$2\ 95 \times 10^6$
Neptune around sun	3 37		$5\ 43 \times 10^5$
Sound in iron	3 1	'	5×10^5
Hydrogen molecules at 0°C	1 11		$1\ 8 \times 10^5$
Sound in water	0 9		$1\ 46 \times 10^5$
Rifle bullet in air	1,970	ft per sec	6×10^4
Nitrogen molecules at 0°C	1 630		$4\ 97 \times 10^4$
Earth rotation at equator	1 525	'	$4\ 65 \times 10^4$
Oxygen molecules at 0°C	1,525		$4\ 65 \times 10^4$
Sound in air	1 089	'	$3\ 32 \times 10^4$

Moon around earth	534	"	1 63 × 10⁴ cm /sec
Speed car on racing beach	370	"	1 14 × 10⁴ "
Wind at 100 miles p hr	150	"	4 57 × 10³ "
Nerve impulse	128	"	3 9 × 10³ "
60 miles per hour	88		2 66 × 10³ "
20 miles per hour	29 2		9 × 10³ "
Paper-making machine	16 6		5 × 10³ "
1 centimeter per second			1 "
Crystal growth (picric acid)	14 3	mm per sec	1 43 "
Gas diffusion (H into O)	6 9	'	0 69 '
Fastest plant growth	0 03	'	3 × 10⁻³
Crystal growth (o-phosphoric acid)	0 018	"	1 8 × 10⁻³ "
Growth of beard	0 00001	mm per sec	1 × 10⁻⁶
Growth of eucalyptus tree	10	feet per year	1 × 10⁻⁸
Diffusion of gold into lead	0 002	mm per day	4 6 × 10⁻⁹ "

velon Trade name for a vinylidene chloride plastic

velox Trade name for photographic printing paper

Venetian red A form of ferric oxide, Fe_2O_3 used as a pigment **V white** A mixture of equal parts of lead white and barium sulfate, used as a pigment

venom The poison secreted by reptiles, amphibians, spiders and insects, as, snake v , scorpion v , toad v

vent An outlet for fumes or gases

ventriculin A dry granular powder extracted from desiccated and defatted hog stomach, used in pernicious anemia

Venturi meter Undermeter A pipeline meter for measuring the quantity of liquid flowing past a certain point A stream-line or constriction is used the pressure across which shows the velocity of flow

venus crystals Copper acetate

veratral The bivalent radical, $(3,4)(MeO)_2$-C_6H_3CH=

veratraldehyde $C_9H_{10}O_3$ = 166 2 3 4-Dimethoxybenzaldehyde, *3 4*-dimethoxybenzenecarbonal * $(MeO)_2C_6H_3CHO$ White needles, m 43, b 283 **o-** 2 3-Dimethoxybenzaldehyde

veratric acid $C_9H_{10}O_4$ = 182 2 Dimethoxybenzoic acid, 3-methoxyanisic acid, 3,4-$(MeO)_2$-C_6H_3COOH An acid in sabadilla, m 181 **o-** 2 3-Dimethoxybenzoic acid **formyl-** Opianic acid

veratrin A mixture of the alkaloids of veratrum veratrine, (amorphous and crystalline), sabadine, sabadinine, jervine and other alkaloids Used medicinally as a cardiac sedative and motor depressant **amorphous-** Veratroidine **crystalline-** Veratrine **proto-** See *protoveratrine*

veratrine $C_{32}H_{49}O_9N$ = 591 5 Cevadine, cryst veratrine The chief alkaloid of veratrum Colorless crystals, m 205, insoluble in water, soluble in alcohol or ether Used medicinally, and externally in ointments **proto-** See *protoveratrine*

v hydrochloride $C_{32}H_{49}O_9N$ HCl = 627 9 A colorless, amorphous powder, soluble in water or alcohol **v nitrate** $C_{32}H_{49}O_9N$ HNO_3 = 654 5 A colorless, crystalline powder, soluble in water or alcohol **v sulfate** $(C_{32}H_{49}NO_9)_2$-H_2SO_4 = 1280 80 An amorphous brittle mass, soluble in water

veratroidine $C_{37}H_{53}O_{11}N$ = 698 43 Amorphous veratrine An alkaloid from veratrum It hydrolyzes when heated with potassium hydroxide into cevine $C_{27}H_{43}O_8N$, and 2 molecules of tiglic acid, $C_5H_8O_2$, veratrine gives only one molecule of tiglic acid

veratrole $C_8H_{10}O_2$ = 138 1 Dimethoxypyrocatechol, dimethoxybenzene,* methoxyanisole, $C_6H_4(OMe)_2$ Colorless crystals, d 1 086, m 23, b 205, slightly soluble in water, soluble in alcohol or ether Used medicinally as an antiseptic and anodyne **allyl-** Methyleugenol

veratroyl The monovalent radical, $(3, 4)(MeO)_2$-C_6H_3CO— from veratric acid

veratrum American hellebore, green or false hellebore, Indian poke The dried rhizomes and roots of *V viride*, a Liliaceae It contains the alkaloids veratrine, protoveratrine, rubijervine, pseudojervine, veratravine and veratroidine, used medicinally as a cardiac depressant and diaphoretic

veratryl The monovalent radical $(3 4)(MeO)_2$-$C_6H_3CH_2$— from veratryl alcohol

verbascum Mullein leaves The dried flowers and herbs of *V thapsus*, a Scrophulariaceae It contains an essential oil, tannin, and resin, used medicinally, as the fluid extract, as a demulcent and anodyne Cf *mullein*

verbena Blue vervain, wild hyssop The dried overground portions of *V hastata* Verbenaceae It contains a tannin and bitter principle, used medicinally, as the fluid extract, as a tonic and diaphoretic **v oil** The volatile oil from the leaves of *V triphylla* of France and Spain, containing about 30 % citral Cf *lippuanol*, *andropogon oil East Indian-* Lemongrass oil *Singapore-* Citronella oil

Verbenaceae The vervain family A group of herbs and shrubs, some of which contain aromatic principles

Verbena hastata	verbena
Verbena urticaefolia	white vervain
Verbena triphyllis	verbena oil
Verbena officinalis	verbenaloside
Lantana brasiliensis	lantanine, yerba sagrada
Lippia dulcis	lippia
Premna taitensis	tonga bark

verbenalin Verbenaloside

verbenaloside $C_{17}H_{25}O_{10}$ = 389 19 Verbenalin A crystalline, reducing glucoside from the flowering tops of *Verbena officinalis*, wild verbena, m 181, soluble in water

Verdet's constant The magnetic rotation (R) of polarized light per cm , per unit magnetic field $R = \alpha/Hl$ where α is the rotation in minutes for the substance in a magnetic field of H gauss, and l, the length of the light path parallel to the lines of force Films of Fe, Co and Ni are exceptions to this rule **V's equation** An equation indicating the magneto-optic rotation $\theta = clH\left(r - \lambda\frac{dr}{d\lambda}\right)\frac{r^2}{\lambda^2}$, where c is a constant depending on the substance, l is the length of the path of the polarized beam, H is the intensity of the magnetic fields, r is the index of refraction of the substance, and λ the wave-length of the light used

verdigris Basic cupric acetate It varies from blue to green, and is used as a pigment **blue-** Cupric acetate

verditer Copper carbonate **blue-** Blue copper carbonate **green-** Green copper carbonate

verdoflavin A green reduction-product of riboflavin

verine $C_{28}H_{46}O_8N$ = 523 5 An alkaloid from sabadilla

verium Ve = 224(?) A supposed rare alkali metal, atomic number 87 A liquid like mercury d 2 5(?), m 17(?), b 610(?) It is the most electropositive metal, is not radioactive, has no visible spectrum It is precipitated by silicotungstic acid and occurs in a few clays and alkali deposits of the Western U S , in some springs and in the ocean Cf *virginium* **v silicotungstate** White, long, rhomboidal prisms insoluble in water

vermicide An agent that destroys intestinal parasites Cf *vermifuge, teniacide*

vermiculite The gold-colored mineral $3MgO(FeAl)_2O_3$, $3SiO_2$, it expands on ignition

vermiform Describing a bacterial growth that resembles a mass of worms in appearance

vermifuge An agent that expels intestinal parasites especially worms Cf *vermicide teniafuge*

vermilion Red mercuric sulfide, cinnabar, used as a pigment and as a polishing material for lenses Commercial grades may contain red lead and insoluble synthetic dyes **mock-** Lead chromate

vermilionette A substitute for vermilion, usually chalk etc dyed with a coal tar dye

vermuth A cordial prepared from white wine flavored with wormwood Cf *absinthe*

vernalization The process of bringing plants artificially to the spring state, by subjecting them to indoor temperature before planting Cf *auxin, plant hormone*

vernier A small movable auxiliary scale attached to a larger scale, by means of which more accurate readings can be taken

vernine $C_{16}H_{20}O_8N_8\ 3H_2O$ = 506 3 An alkaloid from ergot and leguminous seedlings, as clover or vetches

vernonine $C_{10}H_{24}O_7$ = 256 2 A glucoside obtained from the batiator root, the root of *Vernonia nigritiana*, a Compositae of Africa A hygroscopic white powder, soluble in water, it acts like digitalis, as a cardiac poison

veronal Barbital

veronica Speedwell The dried herb of *V officinalis*, a Scrophulariaceae It contains an essential oil, tannin and a bitter principle, used medicinally as an alterative and tonic

verrucose Describing a growth of bacteria that resembles warts

verticillic acid $C_{26}H_{32}O_{11}\ (H_2O)$ = 538 4 An acid produced by the mould fungi, *Penicillium Charlesii*

vertivert oil The volatile oil of *Andropogon muricatus*, d 1 015–1 030, soluble in water Cf *citronella oil, verbena oil*

vervain Verbena

vesicant An agent that causes blistering of the skin, as mustard gas, cantharides, croton oil Cf *pustulant* **v gases** A group of poison gases (q v) used in warfare

vesicle A small blister

vesipyrin Spiroform

vesorcinol Dihydroxy toluene

vesotinic acid Hydroxy toluic acid

vessel (1) A container, as, a flask or beaker (2) In biology, a canal or tube for carrying a fluid such as, blood or plant saps

vesuvianite Iodocrase

vesuvin Triaminoazobenzene

vesypin Spiroform

vetiveria Cuscus, khus-khus The Indo-Malayan grass *V zizanioides*, a Graminaceae, whose roots are woven into fragrant mats, fans, baskets, etc **v oil** Oil of cuscus A volatile oil distilled from v Cf *verbena oil*

vial Phial A small bottle Cf *ampoule*

vibracone A vibrating ore screen, the ore is fed on to a vibrating conical surface

vibration A rapid to-and-fro motion, or oscillation **atomic-** The motion of the atoms of a molecule Cf *porphin ring* **electronic-** The conception of the dynamic atom, in which the electrons are in rapid vibration, causing the emission of rays Cf *spinning* electron

vibrator A device that produces mechanical vibration, as screens or shaking devices

vibrograph An instrument for measuring short time-intervals It consists of a rotating drum, on which an electrically-driven tuning-fork records the time

Viburnum A genus of trees and shrubs of the caprifoliaceous family **V opulus** Cramp bark Cranberry tree, Guelder-rose The dried bark of *V opulus*, a Caprifoliaceae It contains viburnin, valeric acid, sugar and tannins, used medicinally as the fluid extract, as a uterine antispasmodic and tonic **V prunifolium** Black haw The dried bark of *V prunifolium*, a Caprifoliaceae It contains viburnin, valerates, citrates, malates and tannin, used medicinally as a uterine sedative and tonic

vicianin A glucoside from the seeds of vetch, *Vicia sativa*

vicianose $C_{11}H_{20}O_{10}$ = 312 15 A disaccharide (glucose and arabinose) obtained by hydrolysis of vicianin

vicilin A globulin from peas beans and lentils

vicinal The neighboring position of radicals, as in the 1 2 3- or 1 2 3 4- positions of the benzene or naphthalene rings, respectively

victor bronze An alloy of 58 5 parts copper, 38 5 parts zinc 1 5 parts aluminum, 1 part iron and 0 03 part vanadium

victoria blue $C_{33}H_{31}N_3\ HCl$ = 505 75 Phenyltetramethyltriamido-α-naphthyldiphenylcarbinol hydrochloride A bronze colored, crystalline powder, soluble in hot water, alcohol or ether Used in the textile industry for dyeing silk wool and cotton **v green** Malachite green **v orange** $C_7H_5O_5N_2K$ = 236 3 Aniline orange, potassium dinitro-o-cresol A reddish-yellow powder, used in dyeing wool and silk **v yellow** Antinnonin

victorium Vi = 117, or monium, Mo A supposed metallic element discovered by Sir William Crookes in 1898 in yttria minerals, which proved later to be a mixture of rare earths

vienna caustic Potassium hydroxide mixed with lime

Vierordt, Carl 1818–1884 A German physician and founder of quantitative spectrum analysis

viferral Hydronal

Villavecchia test A test for sesame oil, in which the sample (5 cc) is shaken with 5 cc of fuming hydrochloric acid and not more than 2 drops of a 1 % solution of furfural in alcohol (Baudouin's reagent) On standing the bottom (acid) layer becomes rose-colored if sesame oil is present

villose Describing a bacterial growth with hairlike flimsy extensions

vinaconic acid $C_5H_6O_4$ = 130 05 Ethylenemalonic acid *1 1*-cyclopropane dicarboxylic acid* $CH_2CH_2C(COOH)_2$ White needles, m 175

vinasse Schlempe The residue from the fermentation of molasses, or grapes, used as a fertilizer or as a source of potassium salts

vinegar (1) A weak (=6 %) solution of acetic acid containing coloring matter and other substances (esters, mineral matter etc), formed by the fermentation of alcoholic liquids such as cider, wine or other fruit juices, with an acetifying organism Cf *acetifier acetimetry* (2) Acetextracts acetum The strained liquid obtained by macerating a drug with dilute acetic acid, as squill v **artificial-** A substitute for vinegar containing acetic acid, which is not wholly the product of alcoholic and subsequent acetous fermentation **distilled-** The product of distillation of vinegar as defined above **imitation-** Artificial v **malt-** Vinegar derived, without intermediate distillation, wholly from malted barley with or without addition of whole cereal grain, the starch of which has been saccharified by the diastase of malt **spirit-** The product of a distilled alcoholic fluid **wood-** Pyroligneous acid

v essence A product made synthetically or by distillation of wood It usually contains 12 % acetic acid, and is colored with an aniline dye or caramel Cf *spirit acid*

vinetine Oxyacanthine

vinic acids A group of organic compounds analogous to acid salts, as $EtHSO_4$, (ethylsulfuric acid or sulfovinic acid) **v ether** (Ethyl) ether

vinifera palm oil Bamboo oil

vinilite Vinylite

vinol Vinyl alcohol

vinometer A hydrometer used for estimating the percentage of alcohol in wine

vinopyrine Phenetidine acid tartrate A colorless crystalline powder soluble in cold water decomp by hot water, used as an antipyretic

vinum The Latin term for wine

vinyl Ethenyl* The monovalent radical, $-CH{:}CH_2$, derived from ethylene (Cf *polyvinyl vinylene, vinylidene*) **v acetate** The ester $CH_3COOCH{:}CH_2$ **v acetic acid** β-Butenic acid **v acetylene** C_4H_4 = 52 05 Butone, monovinyl acetylene $CH_2{:}CH{-}C{:}CH$ A gas formed on passing acetylene into ammoniacal cuprous chloride solution, with HCl it forms chloroprene, a source of artificial rubber (see *elastomer*) **di-** See *divinyl acetylene* **v alcohol** C_2H_4O = 44 0 Vinol, ethenol* $CH_2{:}CHOH$ An unsaturated alcohol **v amine** $C_2H_3NH_2$ = 43 06 Ethenylamine* A liquid, b 56 **v benzene** Styrolene **v bromide** C_2H_3Br = 106 95 Ethenylbromide, bromoethene*, $CH_2{:}CHBr$ A colorless liquid, d -1 517, b $_{760mm}$16, insoluble in water, soluble in alcohol or ether **v chloride** C_2H_3Cl = 62 5 Chloroethylene, chloroethene* A colorless gas d $_{13.9}$0 97 b −13 9, soluble in alcohol or ether **v cyanide** C_3H_3N = 53 03 Acrylonitrile, propenenitril*, $CH_2{:}CHCN$ A colorless liquid, m −82, b 78 **v ether** C_4H_6O = 70 1 V oxide, ethenyloxyethene* The unsaturated compound $CH_2{:}CHOCH{:}CH_2$ A colorless liquid, b 39, insoluble in water, soluble in alcohol or ether **v ethylene** Bivinyl **v imine** Dimethylene imine **v iodide** Iodoethylene **v ketone** Pentadienone **v oxide** Vinylether **v sulfide** C_4H_6S = 86 13 Ethenylthioethene* The unsaturated compound, $CH_2{:}CHSCH{:}CH_2$ A colorless, oily liquid, d 0 913, b 101, slightly soluble in water, soluble in alcohol or ether

vinylene The bivalent radical, $-CH{:}CH-$, derived from ethylene (Cf *vinyl, vinylidene*) **v chloride** Ethylene dichloride

vinylidene The bivalent radical $H_2C{:}C{=}$ derived from ethylene Cf *vinyl, vinylene*

vinylites A group of synthetic resins made by polymerization of vinyl compounds **v A** A solid, colorless, thermoplastic resin softening at 40–60°C soluble in ketones, esters and hydrocarbons **v 80** A white powder partly soluble in ketones **v N** A 35 % solution in toluene V are used in the manufacture of dentures (Resovin) and phonograph records, and may be colored with dyes and pigments

vinyon A vinyl-type plastic (q v) product having a low melting point and resembling nylon, q v

vioform $C_9H_4N(OH)ICl$ Nioform, iodochlorohydroxyquinoline A voluminous pale, greenish-yellow powder, m 177, insoluble in water alcohol or ether, used as an iodine dusting powder

Viola A genus of plants of the *Violaceae* the violet family, which includes violet and pansy Cf *violine*

V odorata	sweet violet
V canina	dog violet
V tricolor	pansy or heart's ease

v crystallina A pure gentian violet, used to treat impetigo **v quercetrin** Oxyrutin

violanthrole $C_{34}H_{16}O_2$ = 456 2 Dibenzanthrole A nonacyclic diketone, a purple dye for vegetable fibres

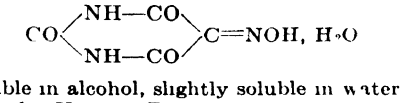
violaquercitrin $C_{27}H_{30}O_{16}$ = 610 3 Osyrutrin A glucoside from various *Viola* species (pansies and violets), it hydrolyzes to glucose, quercitrin and isodulcitol

violaxanthin $C_{40}H_{56}O_4$ = 600 5 A carotenoid (q v), m 207, from the pigment of pansies, *Viola tricolor*, and the rind of oranges

violet (1) A species of plants of the Violaceae family Cf *Viola* (2) A reddish-blue shade or pigment resembling the extreme blue end of the visible spectrum **anthracene-** Gallein **crystal-** Methyl v **Dobner's-** Aminofuchsin iminochloride A triphenyl methane dyestuff, used instead of fuchsin as a test for aldehydes **essence of-** Orris **ethyl-** See *ethyl v* **gentian-** See *gentian violet* **hexamethyl-** Methyl v **Lauth's-** Thionine **methyl-** See *methyl violet* **ultra-** See *ultra-violet*

violine An alkaloid isolated from *Viola* species, and resembling emetine in action

violuric acid $C_4H_3O_4N_3$ = 157 09 5-Oxime alloxan, 5-isonitrosobarbituric acid The ring-compound,



soluble in alcohol, slightly soluble in water

viosterol Vitamin D

Virginia snakeroot Serpentaria

virginium Vi (or Vm) Ekacesium Element No 87 discovered by Allison and Murphy (1930) by the magneto-optic method It is said to occur in minute traces in pollucite and lepidolite Cf *alabamine, verum*

viridine (1) $C_{12}H_{19}N$ = 177 2 A homolog of pyridine, distilled from coal tar and bone oil (2) An alkaloid found in *Veratrum viride*, it resembles jervine

viridinine $C_8H_{12}N_2O_3$ = 184 1 A monoacid base obtained from putrid pancreas

virulence Extreme toxicity or poisonous effect

virulent Exceedingly poisonous or active in damaging protoplasm, as of bacteria

virus An animal poison that can transmit disease An obligately-parasitic pathogen too small to be resolved by ordinary microscope methods They are all chemically-similar nucleoproteins with varying P and carbohydrate contents, but they have widely different stabilities, properties and transmission characteristics

viscamite A vegetable glue used in the woodworking industry

viscid Sticky or gummy, glutinous

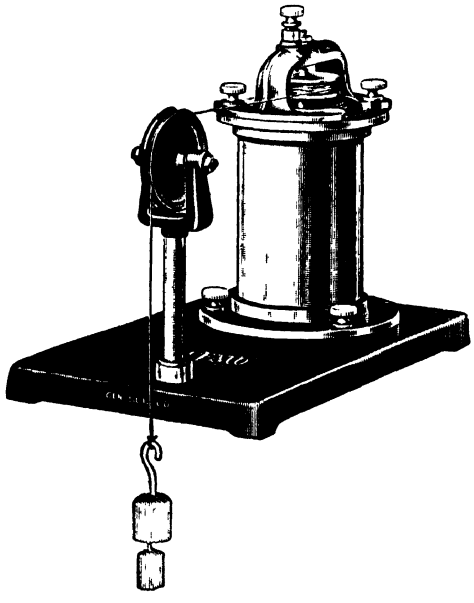
viscidity Stickiness

viscin $C_{20}H_{48}O_8$ or $C_{20}H_{32}8H_2O$ = 416 5 The glutinous constituent of the berries of the mistletoe, the chief constituent of bird lime See *viscum*

viscometer Viscosimeter

viscose An extremely viscous syrup-like liquid obtained by treating cellulose with potassium hydroxide and carbon disulfide, from which acids precipitate cellulose By pressing this liquid through fine openings into dilute acids the cellulose separates as fine, silky threads— viscose rayon, q v **v silk** See *rayon*

viscosimeter Viscometer An instrument for determining the internal friction or fluidity of a liquid by measuring the number of revolutions



Torsion viscosimeter

of a vane immersed in the liquid in comparison with its speed in water (cf *consistometer*), or its rate of flow through an orifice (cf *Engler*) **torsion-** A v based on the force required to twist a cylinder immersed in the liquid through a certain angle

viscosimetry The methods of determining the fluidity of liquids

viscosity Internal fluid friction The property of being glutinous or sticky, *i e*, offering a slight resistance to a change of form, caused by the molecular attraction between the molecules of a liquid Poiseuille's formula for determining dynamic v by the capillary tube method is $v = \pi pr^4t/8lV$, poises where p is the pressure difference between the two ends of the tube, r the radius of the tube, l its length, and V the volume of liquid delivered in a time t Antonym fluidity Cf *poise, centipoise, Engler degree, Redwood, Saybolt seconds, Arrhenius, Einstein, Meyer's formula, softening* **relative-** The v of a liquid as compared with that of water at 20°C , *i e*, 1 005 centipoises **Woolwich-** The time taken (secs) for a steel ball $\frac{1}{16}$ th in in diameter to fall 15 cms through a solution at 20°C

v index A value indicating the relation of the v of a petroleum lubricating oil to its temperature $v\,i = \left(\frac{L - U}{L - H}\right) \times 100$, where L and H are the viscosities at the low and high temperature respectively Cf *S A E number*

viscous Sticky or gummy

viscum Mistletoe The leaves and branches of *V flavescens*, a Loranthaceae It contains viscin, bassorin, gum and tannin Used medicinally as an antispasmodic and tonic, also in the preparation of bird lime

visibility The property of being able to be seen, or perceptible to sight The visibility, K, of a particular wave-length of light is the ratio of luminous flux, F, to the radiant power producing it **mean-** The average visibility, K_m, over any range of wave-lengths or the entire spectrum, K_m = (F)/(erg/sec) where (F) is the total luminous flux in lumens and (erg/sec), the total radiant energy in watts or erg/sec

visible Perceptible by the eye, as, v light, v spectrum

vistanex A synthetic fiber produced by spinning a viscous solution of polyisobutylene in n-hexane (cf *vinyon*)

vitagen A substance having vitamin (q v) activity, but also providing energy for life *E g* , essential fatty acids, as linoleic, linolenic and arachidonic acids (vitamins F, F_1), carbohydrates (*e g* , inositol), amino acids (lysine, tryptophane, etc), choline and its derivatives (*e g* , betaine, methionine), and sulfur organic compounds

vitaglass A colorless, transparent window glass which allows the passage of ultra-violet light, also used in screens for mercury-vapor lamps

vital Pertaining to life

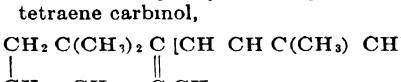
vitamin Accessory (food) factor (Hopkins, 1906), vitamin "e" (essential to life, Funk 1912), advitant, exogenous hormone, food hormone, vitol, biosterin An organic substance which is essential in small quantities for maintaining the life of an animal, but which cannot be synthesised by the animal, and does not itself provide energy, cf *vitagen, vitazyme, vitasterol, biocatalyst* Antonym toxamin An absence or deficiency of one or more vitamins in a diet results in characteristic diseases or disorders (avitaminosis), an excess of some vitamins may also have ill-effects (hypovitaminosis) Vitamins have been classified according to their solubility or the effects they produce, and were known by letters A number however, have now been synthesised, and the chemical struc-

formerly regarded as single vitamins are now known to consist of a "complex" of several vitamins, often having similar but different properties The known vitamins and their commonest synonyms are (H R Rosenberg, *Chemistry and Physiology of Vitamins*, 1942)

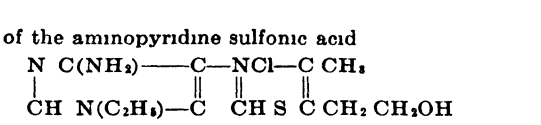
	Identified	Non-identified
Vitamins A	A (axerophthol)	
	A_2	
	A_3 (?)	
Vitamin B complex	B_1 (thiamin)	B_3 (pantothenic acid?)
	B_2 (riboflavin)	B_4 (biotin, arginine and glycine?)
	B_6 (pyridoxin)	B_8 (nicotinic acid?)
	B_8 (nicotinic acid)	B_7 (vitamin I)
	B_3 (pantothenic acid)	B_8 (adenylic acid)
	inositol (q v)	B_0
	p-amino benzoic acid (q v)	B_p (anti-perosis v)
Vitamin C	ascorbic acid	J, vC_2 (anti-pneumonia v)
Vitamins D	D_2 (viosterol, calciferol)	Factor T
	D_3, D_4, D_5 and D_6	L and L (lactation v)
Vitamins E	α-, β- and γ-tocopherols	M (mouse factor, q v)
	H (biotin)	Factor U
	K_1 and K_2	Folic acid (q v)
	P (citrin)	Grass time factor (q v)

antiberiberi- V B **anticanitic-** *p*-Aminobenzoic acid **antiencephalitic-, antidermatitic-** V B_3 **antihemorrhagic-** V J **anti-infection-** V A **antineuritic-** V B_1 **antipellagric-** V B_2 **antiperosis-** V B_p **antipneumonia-** V J **antirachitic-** V D **antiscorbutic-** V C **antisterility-** V E **apparent-** A type of reductone, q v **lactation-** Vitamins L **pro-** See *provitamin* **sunshine-** V D **weight-restoring-** V B_3

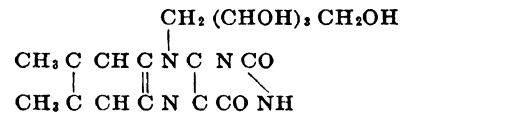
v A $C_{20}H_{30}O$ = 286 2 Vitasterol A, biosterin A, v A_2, ophthalin, anti-infection v The trimethyl cyclohexenyl dimethyl octatetraene carbinol,



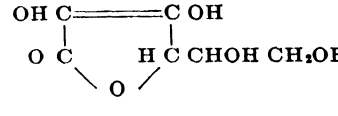
A readily-oxidised, fat-soluble and water-insoluble alcohol in butter, milk, egg-yolk, green vegetables, fish livers (especially of cod, halibut, mackerel and black sea bass), and in glandular fat, yellow isotopic plates, m 63 It has epithelium-protecting and anti-xerophthalmic properties, and is essential to growth, a deficiency of it also results in the common cold It is derived from carotene, q v Activity, 4.5×10^6 I U per gm **v A_2, v A_3** Vitamins similar to v A, from fish oils, they are probably β-apo-5-carotinols (cf *cholane*) **v B** A complex (see table) now known to consist of the 12 following $C_{12}H_{17}ON_4SCl\,HCl$ = 337 2 Thiamin (U S usage), aneurin(e) (European usage), oryzamin (Japanese usage), torulin, polyneuramin, betaxin, v F (obsolete) **antineuritic v** Antiberiberi v The hydrochloride of the aminopyridine sulfonic acid



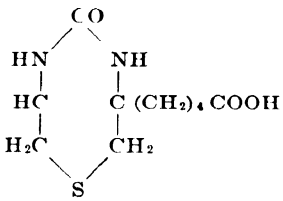
A heat-labile, antineuritic powder, m 249, soluble in water or alcohol, insoluble in ether or benzene, found in the outer coatings of grains, fruits and vegetables (*e g* , ripe peas and beans) and in yeast, often with riboflavin (see *v* B_2) It is oxidised to thiochrome Activity 3,333,000 I U per grm **v B_2** $C_{17}H_{20}N_4O_6$ = 376 2 Riboflavin (U S usage), lactoflavin (European usage), uvoflavin, ovoflavin, hepatoflavin v G Pellagra-preventing v The heat stable-lyochromic lactoflavin (q v)



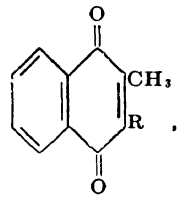
Orange-yellow crystals, m 282 (decomp), soluble in alkali, slightly soluble in water or alcohol (green-yellow fluorescence), insoluble in ether or acetone It is widely distributed in plant and animal cells, milk and urine, and has pellagra-preventing properties Activity, 400,000 Bourquin-Sherman units per gm **v B_3** $C_{19}H_{17}O_5N$ = 339 2 Pantothenic acid (from Greek, "everywhere"), pantothen, anti-dermatosis factor, chick antidermatitis factor, yeast filtrate factor, chick A P (anti-pellagra) factor, liver factor 2 The pale, yellow viscous oil OH CH_2 CMe_2 CHOH CO NH CH_2 COOH, $[\alpha]_D^{25}$ + 37 5°, soluble in water, slightly soluble in ether, insoluble in benzene It occurs in animal tissues, livers and kidneys, and its absence results in loss of weight, it has been identified with v B_2 and B_4 Activity, 70,000–75,000 chick units per g **v B_4** Biotin, arginine, glycine (?) A v of which little is known, it prevents pellagra in rats **v B_5** Nicotinic acid (q v) nicotinamide, niacin, niacinamide, P P factor, pellagramine, niamid A v from living cells, liver and yeast, which prevents pellagra and lesions of the mucous membrane **v B_6** $C_8H_{11}O_3N$ = 289 1 Pyridoxin (U S usage), adermin (European usage), rat-antidermatitis factor, yeast eluate factor, factor 1, factor Y, v H , complementary factor 3-Hydroxy-4 5-di(hydroxymethyl)-2-methylpyridine Colorless crystalline powder, with a slightly bitter taste, m 160, soluble in water, acetone or alcohol, slightly soluble in ether or chloroform It occurs in yeast and rice polishings and in seed husks, and prevents dermatitis **v B_7** V I A supposed v , which prevents digestive disturbances in pigeons **v B_8** Adenylic acid A supposed v , the absence of which prevents the development of lactic bacteria **v B_c** A supposed vitamin, which prevents anemia in chicks **v B_p** Anti-perosis v A supposed v , which prevents the deformation of chicks' legs **v B_u** V H **v B_x** $C_6H_8O_6$ = 176 1 *p*-Amino benzoic acid **v C** Ascorbic acid, hexuronic acid, cevitamic acid, antiskorbutin, scorbutamin The hexuronic acid,



White colorless, odorless crystals, m 191 soluble in water, slightly soluble in ether or benzene, insoluble in alcohol It occurs in citrus fruits and green vegetables, and its absence from a diet causes scurvy Activity, 20 000 I U per gm **v C**. See table **v D** $C_{27}H_{42}O$ = 382 3 Viosterol, vitasterol D, biosterin 2, antirachitic v , rachitamin, irradiated ergosterol, acterol A fat-soluble v from milk and fish (cod)-liver oils, produced by activation of provitamins D (q v) by ultra-violet light, its absence causes rickets It is believed to be composed of 10 vitamins, but only 5 have been prepared, viz **v D_1** A mixture of v D_2 and lumisterol (q v) **v D_2** $C_{28}H_{43}OH$, activated ergosterol calciferol viosterol, m 116, an isomer of ergosterol **v D_3** Activated 7-dehydrocholesterol m 82 **v D_4** Activated 2,2-dehydroergosterol, m 107 **v D_5** Activated 7-dehydrositosterol All are white crystalline solids, soluble in fats or organic solvents, insoluble in water **v E** Tocopherol (Greek, "childbirth") antiencephalomalacin v , factor x, antisterility v , reproductive v , fertility v , sterilamin, vitasterol E, biosterin 3 It comprises α-tocopherol, $C_{29}H_{50}O_2$, β-tocopherol, $C_{28}H_{48}O_2$, γ-tocopherol, $C_{28}H_{48}O_2$ (activities, 400, 200 and 200 rat units per gm , respectively) They occur principally in plants and vegetable oils **v F** (1) V B_1 (2) See *vitagens* (3) A supposed anti-pernicious anemia v **v G** V B_2 **v H** $C_{10}H_{16}O_3N_2S$ = 244 3 Biotin bios II bios II B factor X factor W coenzyme R, skin factor



A v which occurs widely in nature (*e g* , in vegetables and yeast) Its absence causes injury to white of egg, and prevention of the growth of *Saccharomycetes* yeasts and rats Activity, 27×10^6 rat units = $25\,000 \times 10^6$ S U per gm , 1 S U = the amount of v H to increase the cell-growth of yeast by 100 % **v I** V B_7 **v J** See table **v K_1, K_2** etc α-, β- etc phylloquinones coagulation v , anthemorrhagic v , prothrombin F General formula



where R varies according to the v K, v K_1 ($C_{31}H_{46}O_2$) and v K_2 ($C_{41}H_{56}O_2$) are known for certainty They occur in hog-liver, leafy vegetables and cereals, and their absence inhibits the clotting of blood There is as yet no international standard **v L** See table **v M** A supposed vitamin, whose absence causes anemia in and loss in weight of monkeys **v P** (1) Citrin, permeability v A crude extract from paprika, rose hips or citrus fruits consisting principally of eriodictin (5 7 3′ 4′-tetraxhydroxy flavanol) and hesperitin (4′-methyl eriodictin) it decreases the permeability of cells to albumin (2) V B_1 (3) V B_x **v T** A supposed v , the absence of which causes thrombocytosis **v U** A supposed v , which promotes the growth of chicks **v units** The existing (1942) International Units (I U) are defined as the activities of

v A—0 6 μgm of pure β-carotene
v B—3 μgm of pure anhydrous aneurin hydrochloride
C—50 μgm of pure ascorbic acid
D—1 μgm of a certain solution of crude, irradiated ergosterol
E—1 μgm of synthetic, racemic tocopheryl acetate

For v C 1 Sherman unit = 0 5–0 6 mgm ascorbic acid = 1 minimum protective dose (guinea-pig), formerly based on 1 ml of fresh lemon juice

For v D I U = 1 U S P unit = 1 Medical Research Council unit = 1 Coward unit = 0 025γ v D_2 = 1 66 Oslo unit = 2 6 prophylactic units = 10^{-6} standard units, 1 clinical unit = 12 5–17 1 I U , 1 Steenbock unit = 3 2 I U

See also under individual vitamins

VITAMINS

	A	C	D	E	F, B_1	G, B_2
Apples	1	2			2	2
Asparagus					3	3
Beans	1				3	2
Beets		1			1	1
Bread, white					1	1
Bread, whole wheat	2		1	1	2	2
Butter	3		1			
Cabbage	2	3			2	2
Carrots	2	2			1	1
Celery	2	2			2	2
Cheese	2		1		2	2
Codliver oil	3		4			
Cream	3	1	1			
Eggs	3		1		1	1
Lard						
Lemons		3			2	2
Lettuce	2	3		2	2	1
Liver	3		1		1	1
Meat, lean	1			1	2	3
Milk	3	2	2	1	2	2
Nuts					3	2
Orange juice		3			2	2
Peaches	2	2				
Peas	2	3			2	
Pineapple	2	3			2	2
Potato	1	2			2	2
Rice, whole	1				2	2
Spinach	3	3			2	1
Sugar						
Tomato	2	3			3	3
Turnip		3			2	1
Wheat, whole	2			3	3	2
Yeast					3	3

1, small amount, 2, fair amount, 3, large amount, 4, very large amount

vitaminosis Hypovitaminosis The effect of overdosage with vitamins, cf *avitaminosis*

vitasterol Vitamins A, D, and E

vitazyme Homozyme Ergon A substance having the properties of both a vitamin (q v) and an enzyme Cf *biocatalyst, egrine*

vitellin A globulin from egg-yolk Similar proteins occur in lentils, corn and other cereals **silver-** Argyrol

vitelloluteın The yellow coloring matter of eggs

vitexine $C_{21}H_{14}O_6 = 362\ 09$ A coloring matter and flavone glucoside in *Vitex litoralis*, a Verbenaceae

vitiatine $C_5H_{14}N_6 = 158\ 07$ A meat base

vitol Vitamin

vitrain A constituent of *coal*, q v

vitreosil A translucent variety of prepared silica, made by fritting sand with a hot carbon plate, used for heat-resisting apparatus

vitreous Glassy **v copper ore** Redruthite **v silver ore** Argentite

vitrescence The property of becoming hard and transparent like glass

vitrification The conversion of a material into a glass or glass-like substance, having increased hardness and brittleness

vitrify To sinter or melt to a glassy mass

vitrinite A uniform brown constituent of coal, which has a low ash content, and consists mainly of ulmin compounds Cf *vitrain*

vitriol A surface of a heavy metal, as,

blue- or Roman-	copper sulfate (chalcanthite)
green-	ferrous sulfate (copperas)
red- or rose-	cobaltous sulfate (bieberite)
uran-	uranium sulfate (johannite)
white-	zinc sulfate (goslarite)

oil of- Sulfuric acid Cf *B O V D O V*, *R O V* **salt of-** Zinc sulfate

vitriolate An obsolete term for the sulfate of a metal **v of soda** Sodium sulfate **v of tartar** Potassium sulfate

vitro- A Latin prefix, which means glass and indicates a mineral or rock of glassy texture, as vitrophyre **in v** See *in vitro*

vitrophyric Describing an igneous rock having a glassy base

vivianite $Fe_3(PO_4)_2\,8H_2O$ Blue ocher, blue iron ore A native ferrous phosphate which when freshly broken is white, and becomes bluish on oxidation

vivo Pertaining to life **in v** - See *in vivo*

vocoder An instrument for synthesising speech and other sound-effects by electrical methods

Vogel, August 1817–1889 A German agricultural chemist, noted for his methods and text books

volatile Describing a substance that evaporates rapidly **v alkali** Ammonia **v oils** Essential oils **v poisons** A poisonous substance that forms vapors

non-metallic poisons Br, Cl, I, F, HF, P, AsH_3, SbH_3, BiH_3, PH_3 and H_2S

organic poisons chloral, chloroform, ether, aniline, acetanilide, etc

volatility product A conception analogous to that of the solubility product (q v), applied to a solid substance (as ammonium carbonate) which dissociates into two volatile gases when heated The product of the concentrations of the constituent gases is constant

volatilization Vaporization the conversion of a solid into a vapor or gas without chemical change

volatilize To convert into a gas or vapor

volborthite A native hydrous copper-calcium vanadate

volcanic Pertaining to molten rock or lava **v ash** Tuff **v glass** A volcanic igneous rock, as, obsidian or pitchstone **v mud** A mud consisting of fine grained ash or tuff mixed with water

volemite Volemitol

volemitol $C_7H_{16}O_7 = 212\ 2$ Heptahydroxyheptane heptaheptanol, volemite, α-sedoheptitol The heptatomic alcohol, $CH_2OH(CHOH)_5CH_2OH$, m 150, $[\alpha]_D$ + 2 25–2 65, from *Lactarius volemus* and *Primula* species Cf *primulite*

Volhard, Jakob 1834–1910 A German organic chemist, noted for his analytical methods **V 's solution** A decinormal solution of potassium thiocyanate **V 's volumetric method** The determination of halogens by means of standard thiocyanate solutions

volkonskoite A magnesium chromium silicate containing 30 % Cr_2O_3, used as zeolite, q v

volt A unit of electromotive force and potential difference It is the potential or electrical pressure which, if steadily applied to a conductor of one ohm resistance, will produce a current of one ampere

$$1 \text{ International volt} = 10^8 \text{ e m u} = \frac{1}{300} \text{ e s u}$$

$$= 1\ 00043 \text{ absolute volt}$$

The electromotive force of a Weston normal cell at 20°C is 1 0183 international volts **ampere-** Watt **electron-** See *electronvolt*

Volta, Count Alessandro 1745–1827 An Italian physiologist, noted for his early electrical experiments, and the construction of the first electric pile **v couple** An electric cell which consists of a zinc anode and copper cathode and has a potential of 0 98 volt **v effect** The change in the sign of the charge on a metal electrode after it has been heated **v series** Displacement series

voltage The electromotive force measured in volts See *potential*

voltaic Pertaining to a direct electric current **v battery** A number of v cells **v cell** An electric cell or device in which an oxidation-reduction reaction occurs in such manner that an electromotive force is produced Classification

A Double fluid cells—
(see) Bunsen cell
Dichromate cell
Daniell cell
Grove cell
Marie-Davy cell
Partz cell

B Single fluid cells—
(see) Leclanche cell
Chaperon cel
Edison-Lelande cell
Gassner cell
Regnault cell
Poggendorff cell

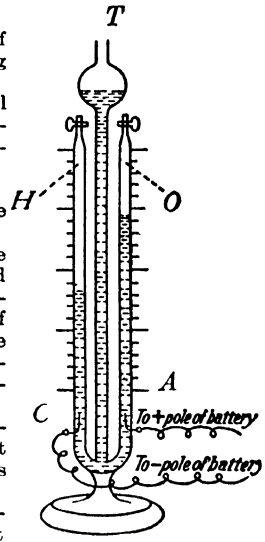
C Standard cells—
(see) Weston normal cell
Cadmium cell
Clark standard cell

D Secondary cells—
(see) Lead accumulator
Regun cell
Edison cell

v couple A pair of metallic electrodes used to produce a potential when set up as a cell, as a volta couple **v electricity** Galvanic electricity, chemical electricity A continuous stream of electrons caused by a chemical reaction, a direct current of electricity, q v **v pile** A series of metallic discs forming a v battery

voltaite The mineral $2(FeAl)_2O_3,5(MgFeNa_2K_2)(OH)_2(SO_4),14H_2O$

voltameter Coulometer An apparatus for the electrolysis of water The volume of the gases liberated is used to determine the number of coulombs of current flowing in the circuit during the decomposition Cf *voltmeter*



Voltameter

H = *hydrogen*, O = *oxygen*, C = *cathode*, A = *anode*

voltammeter A measuring instrument that indicates both volts and amperes

voltampère The equivalent of the watt power factor, q v It is the product of a volt and a milliampere

voltmeter A measuring instrument that indicates voltage Cf *voltammeter*

voltoids Small compressed tablets of ammonium chloride, used in the preparation of voltaic (Léclanché) cells

voltolise To subject to a silent electric discharge

voltzite ZnS OS_4 A native zinc oxy-sulfide

volume The space occupied by a substance It is generally expressed in cubic centimeters or liters according to the formula, $V = CL^3$, in which C is a constant depending on the shape of the space occupied (if a cube, C = 1) and L is the length **atomic-** the quotient of the atomic weight and the specific gravity of a solid or liquid element at vol = at wt /d It varies periodically with the atomic weight **critical-** The volume occupied by 1 gram of a gas at the critical temperature and pressure See *parachor* **co-** The quantity *b* in van der Waals equation, q v **incompressible-** That which cannot be made smaller by pressure **molecular-** The volume occupied by one gram-molecule or mole of any substance, *i e*, the molecular weight divided by the density It varies for solids and liquids according to their atomic volumes, but is 22 4 liters for gases at normal temperature and pressure See *parachor* **specific-** The volume occupied by one mole of a substance, hence, M/D = sp vol, where M is the molecular weight, and D the density **standard-** The volume occupied by one mole of gas at 0°C and 760 mm pressure = 22 4 l

v susceptibility The ratio of the intensity of magnetization of a medium to the strength (in gauss) of the magnetic field inducing it

volumenometer (1) An apparatus for the accurate determination of the volume of a known weight of substance, and thence its density (2) An obsolete term for pyknometer

volumetric Pertaining to measurements of volumes **v analysis** The quantitative analysis of a known volume of an unknown solution by adding a reagent of known concentration until the end-point of the reaction has been reached From the amount of reagent used (volumetric solution), the amount of substance in the analysed solution can be calculated In order to establish a definite end-point, a third substance, the indicator, may be added Methods of volumetric analysis may be classified as

A Neutralization methods
(alkalimetry, acidimetry)

Titration with acids or bases using an indicator
1 Acids—hydrochloric, sulfuric, oxalic acid
2 Bases—potassium, sodium ammonium or barium hydroxides, sodium carbonate
3 Indicators—Phenolphthalein, methyl orange, litmus
4 Strength of solutions—N, N/2 or N/10

B Oxidation-reduction methods
(oxidimetry, iodometry)

Titration with oxidizing or reducing agents, and determining the end-point by decolorization or change of color
1 Oxidizers—Potassium permanganate or iodine
2 Reducers—arsenous acid, oxalic acid, ferrous ammonium sulfate
3 Indicators—starch, potassium iodide, redox indicators
4 Strength—N/10

C Precipitation methods

Titration with a reagent that causes a precipitation
1 2 Solutions—silver nitrate, ammonium thiocyanate
3 Indicators—Potassium chromate, ferrous sulfate
4 Strength—N/10

v glass ware The graduated glass utensils used to measure definite quantities of a solution, *i e*, burettes, cylinders, flasks and pipettes Their comparative accuracy is shown by their limits of error (cf *standardized*)

Capacity	Possible error				
	Transfer Pipet	Measuring Pipet	Buret	Flask	Cylinder
2 cc	0 012 cc	0 02 cc			
5 cc	0 02 cc	0 04 cc			
10 cc	0 04 cc	0 06 cc	0 04 cc	0 06 cc	0 05 cc
25 cc	0 06 cc	0 1 cc	0 06 cc	0 06 cc	0 12 cc
50 cc	0 1 cc		0 1 cc	0 1 cc	0 25 cc
100 cc	0 16 cc		0 1 cc	0 16 cc	0 20 cc
250 cc	0 24 cc			0 22 cc	1 25 cc
500 cc				0 30 cc	2 5 cc
1000 cc				0 6 cc	5 0 cc
2000 cc				1 00 cc	10 0 cc

For more accurate work certified glassware is used (see *standardized buret*, etc)

v factor The amount of substance corresponding with 1 cc of normal, half-normal,

or tenth-normal solution **v solutions** V S Solutions of known strengths used in volumetric analysis See *normal solution* **v standards**

Primary when the composition is gravimetrically determined, as, H_2SO_4 is precipitated with $BaCl_2$ and weighed as $BaSO_4$

Secondary when standardized against a weighed amount of reagent, *e g*, NaOH soln against pure oxalic acid

Tertiary when one soln is titrated against another soln, *e g*, HCl titrated with NaOH (which is standardized against oxalic acid)

v weight The amount of substance to be weighed off in order that, on titration, the number of cubic centimeters found will equal the percentage of unknown present

voluminal Pertaining to three dimensions **v expansion** Cubical *expansion*

voluntal $C_3H_4O_2NCl_3$ = 192 39 Trichloroethylurethan, β-trichloroethylcarbamate, $NH_2CO\text{-}OCH_2CCl_3$ A white crystalline powder, used as anesthetic

volutin A nucleo-protein from yeast

vomicine $C_{22}H_{24}N_2O_4$ = 382 2 An alkaloid from strychnos

V S Abbreviation for volumetric solution

vug A cavity in a casting **v crystals** The metallic crystals found inside v

vulcanite A hard rubber produced by heating caoutchouc or india rubber with sulfur Cf *ebonite*

vulcanization The oxidation of rubber produced by reducing sulfur to sulfides The rubber is mixed with a vulcanizing agent (as, sulfur), and heated to 110–140°C A gradual change takes place from a tacky, plastic mixture to a non-tacky, strong, very elastic or rigid product Various other substances, *accelerators*, may be added to increase the quality of the product (See *vulcanizing agent*)

vulcanize To produce vulcanization

vulcanized Having been subjected to vulcanization **v fiber** See *fiber* **v paper** See *fiber*

vulcanizing agent A substance that renders rubber less sticky and more or less elastic and rigid *E g*, sulfur (chiefly), selenium, sulfur-dichloride, or *m*-dinitrobenzene, also nitrogen compounds such as, di- and triphenylguanidine, tetramethylthiuram and piperidine derivatives

vulnerary A substance used externally in the treatment of wounds and bruises, any agent that has a healing effect on wounds

vulpic acid $C_{19}H_{14}O_5$ = 322 11 Chrysopicrin An acid from the lichen, *Cetraria vulpina*

vulpinite An amorphous form of anhydrite

vuzine $C_{27}H_{40}N_2O_2$ = 424 3 Isooctylhydrocupreine A levorotatory quinine (q v) alkaloid Colorless powder, insoluble in water, soluble in alcohol or ether **v hydrochloride** $C_{27}H_{40}\text{-}N_2O_2\,HCl\,2H_2O$ = 533 44 Colorless crystals, soluble in water, used as a powerful bactericide for deep-seated wounds

W

W. (1) The symbol for tungsten (wolfram). An abbreviation for: (2) work, (3) watt. **W-rays.** The radiations intermediate between U.V.-(ultraviolet, *q.v.*) and X-rays.

w. An abbreviation for: (1) weight, (2) work.

Waage, Peter. 1833–1900. A Norwegian chemist noted for developments in physical chemistry.

Waals. See *van der Waals.*

wabain. $C_{36}H_{46}O_{12}$ = 670.4. A glucoside from the root of *Carissa schimperi* (waba), an apocynaceous tree of Africa. It is a heart stimulant and local anesthetic. Cf. *ouabain.*

Wackenroder's reaction. The reaction between hydrogen sulfide and sulfur dioxide in aqueous solution to form polythionic acid.

wad. (1) Bog manganese. An earthy hydrate of pyrolusite, which contains baryta. Cf. *psilomelane.* (2) Graphite.

Waelz process. A charge of low grade zinc ore is heated with fuel oil or powdered coal in a rotary kiln; volatilized Zn and ZnO are obtained.

wafer. A thin, double layer of dried paste that encloses a medicament. **w. ash.** The bark of the root of *Ptelea trifoliata*, a Rutaceae; used medicinally as a tonic and antiperiodic.

wagnerite. $Mg(MgF)PO_4$. A native magnesium fluophosphate. Cf. *adelite.*

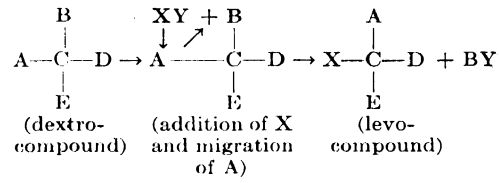
Wagner's reagent. An aqueous solution of I and KI, used as microchemical reagent for alkaloids.

wagofo. An African arrow poison, the dried juice of *Euphorbia* species.

wahoo. Euonymus.

Paul Walden.

Walden, Paul. 1863– . A German organic chemist, noted for research on organic reactions. **W. inversion.** A chemical reaction in which a reversal of the rotatory power of an optically-active compound takes place. It indicates that the mechanism of substitution does not involve the simple replacement of one group by another, but probably the loosening of all groups and atoms followed by a rearrangement.



For example: d-chlorsuccinic acid changes on treatment with potassium hydroxide to l-malic acid, instead of, as expected, to d-malic acid; while l-chlorsuccinic acid changes to d-malic acid and not to l-malic acid.

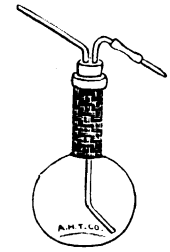
Wallach, Otto. 1847–1931. A German chemist and Nobel prize-winner noted for his research on the constitution of essential oils.

walnut. Juglans. **w. oil.** The clear, colorless oil of walnuts, d_{25}°0.923, n_D^{25} 1.4750; sapon. no. 193.2, iodine no. 150.6. Used as an emulsifier in cosmetics.

warfare gas. See poison *gas.*

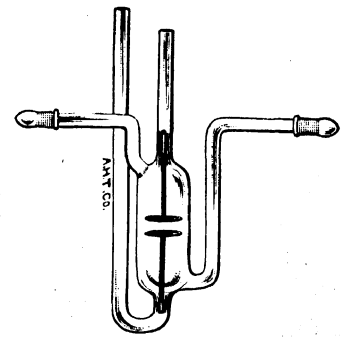
warringtonite. Domingite.

wash-bottle. A glass flask fitted with a stopper and two unequally-long tubes, so arranged that on blowing through one, a stream of water emerges from the other. Used to wash precipitates on filters, and in other chemical operations.



Wash-bottle for hot water.

Washburn cell. A glass vessel with two electrodes; used for the accurate determination of the electrical conductivity of solutions (see illustration).



Washburn cell.

washing. Rubbing and rinsing with a liquid. **w. bottle.** See *wash-bottle.* **w. soda.** Sodium carbonate.

Wassermann, A'u'g'u'st von. 1866–1925. A German biochemist. **W. reaction.** Σ test. A diagnostic reaction for syphilis, in which a series of blood samples is subjected to the ac-

tion of various hemolytic sera Cf *complement fixation*

waste Matter or energy which is not utilized **industrial-** Materials as spent acid, flue gas, sulfite liquor, refuse, sewage, paper, metal scrap, rubber waste, distillery slop, etc Cf *xylan*

water (1) H_2O = 18 016 Hydrogen oxide A colorless and tasteless liquid, forming the larger proportion of the earth surface, m (or freezes) 0°C (= 32°F = 0°R), b 100°C (= 212°F = 80°R), it is the most widely-used solvent It was regarded as an element by the alchemists, and was first recognized as a combustion product of hydrogen by Cavendish in 1781, as a compound of oxygen and hydrogen by Lavoisier in 1783, and as a mixture of isotopic compounds in 1933 (Cf *heavy-*) Its exact structure is still undetermined but it must be a mixture of multiples of H_2O, as, H_4O_2 dihydrol, H_6O_3, trihydrol, etc Cf *ice w*, *steam w* Water is an essential constituent of all living organisms and occurs as "water of crystallization" in many crystals and compounds (See *water constants*) (2) Aqua Pharmaceutically, a weak solution of a volatile substance in water, as, peppermint w, rose w, chlorine w, ammonia w (3) The transparency of a precious stone, as of a diamond **acidulous-** W containing dissolved CO_2, together with alkali bicarbonates and common salt The CO_2 may be liberated with effervescence when such w is slightly warmed, *e g*, Appolinaris and Seltzer (*i e*, Selters) w **aerated-** A water containing a gas, as, air or carbon dioxide **alkaline-** A mineral w containing bicarbonates of Na and sometimes of Li and K, *e g*, Vichy w **bitter-** A mineral water containing the sulfates of Na and Mg, *e g*, Marienbad w **bound-** That portion which does not freeze when the system (*e g* tissue, colloid, etc) is maintained at −20°C **capillary-** The w of the soil held between rock interstices above the ground water **carbonated-** A drinking water containing CO_2 under pressure **chalybeate-** Ferruginous w A mineral w containing ferrous carbonate held in solution as bicarbonate, as, Pyrmont w **cologne-** A water containing essential oils (such as bergamot, orange flower, lavender) used as a household perfume **conductivity-** A water distilled repeatedly through silver stills, used as a solvent in electrolytic measurements **crystal-** W of crystallization **distilled-** W that has been purified by distillation **drinking-** W which contains neither a pathogenic organism nor a large amount of organic matter The total solids do not exceed 1000 parts per million and the following upper limits apply Pb 0 1 Cu 0 2, Zn 0 5, Fe 0 3, Mg 100, Cl^- 250, SO_4^{--} 250 pts per million **ferruginous-** Chalybeate- **free-** That portion of a system which freezes Cf *bound-* **ground-** The water which lies at a definite level beneath the soil **hard-** W that contains the carbonates and bicarbonates of calcium and magnesium, hence it forms insoluble compounds with soap and prevents the formation of lather See *w purification* **heavy-** (1) Deuterium oxide, D_2O or H^b_2O = 20 0 The isotopic compound of hydrogen of mass 2 (deuterium, diplogen) with oxygen Its physical constants as compared with light water, are

	Light- H_2O	Heavy- D_2O
d (20°C)	0 9982	1 1056
m	0°C	3 802°C
b	100°C	101 42°C
refractive index	1 33293	1 3281
viscosity	10 87	14 2
surface tension	72 75	67 8
Raman spectrum	3420 A U	2549 A U

(2) One of the other isotopic compounds, as, DOH, TOT, TOH, TOD, where D is hydrogen of mass 2, T hydrogen of mass 3 (tritium), or H_2O^b, H_2O^c, D_2O^b, D_2O^c, T_2O^b, T_2O^c, where O^b is oxygen of mass 17, and O^c oxygen of mass 18, or a combination of these (as, DO^bH) **hepatic-** A mineral w containing hydrogen sulfide and alkali sulfides, *e g*, Harrogate w **ice-** Freshly molten water containing smaller aggregates of $(H_2O)_x$ than does water at 4°C Cf *steam w* **industrial-** W that can be used for washing or like process work, but is not necessarily potable **juvenile-** W of deep-seated origin, that is supposed to have reached the surface of the earth for the first time **light-** Protium oxide See *heavy-* **meteoric-** W coming from the atmosphere, as, rain and snow **mineral-** A natural w used for therapeutic purposes on account of special constituents (1) acidulous, (2) chalybeate, (3) hepatic (4) alkaline, (5) bitter, (6) siliceous w, (7) hot springs, which may contain traces of radium emanation to which their medical properties are attributed **natural-** A w as it occurs in nature It contains various impurities and may be classified as rain, snow, river, spring or deep well w, sea and mineral waters (cf table) The impurities may be suspendde, or dissolved solids and gases **potable-** W that is fit to drink, *e g*, non-typhoid, non-polluted Cf *drinking-* **pure-** W that has been repeatedly distilled and subjected to purifying operations It is very difficult to obtain and to maintain in a state of purity **sea-** Ocean w which contains on an average of 3 6 per cent of solids, of which 2 6 per cent is sodium chloride See *hydrosphere* **siliceous-** W containing dissolved colloidal silica and alkali silicates, *e g* the almost boiling w of the geysers of Iceland, New Zealand, and Yellowstone Park **soda-** q v **soft-** (1) Rain w or snow w, which is naturally free from Ca and Mg salts (2) Water that has been purified by removal of Ca and Mg salts See *hard w*, *w purification* **steam-** Freshly-condensed w It contains a different proportion of dihydrol and trihydrol, and has different biochemical properties to ice w (q v) **sterilized-** W in which all micro-organisms have been destroyed **sweet-** Water containing glycerin residues, a waste product from soap manufacture

NATURAL WATERS

Classified according to the negative or positive ions present

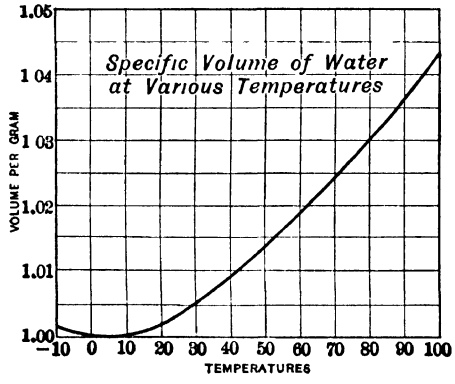
A *Chloride* waters, principal negative ion is Cl^-
- a principal positive ion is sodium
- b principal positive ion is calcium
- c waters rich in magnesium

B *Sulfate* waters, the principal negative ion is SO_4^{--}
  a principal positive ion is sodium
  b principal positive ion is calcium
  c principal positive ion is magnesium
  d waters rich in iron or aluminum
  e waters containing heavy metals
C *Sulfate-chloride* waters, both SO_4^{--} and Cl^- are abundant
D *Carbonate* waters, the principal negative ion is CO_3^{--} or HO^-
  a principal positive ion is sodium
  b principal positive ion is calcium
  c chalybeate waters
E *Sulfate-carbonate* waters, SO_4^{--} and CO_3^{--} abundant
F *Chloro-carbonate* waters, Cl^- and CO_3^{--} abundant
G Triple waters containing Cl^-, SO_4^{--} and CO_3^{--} in notable amounts
H *Siliceous* waters, rich in silica
I *Borate* waters, the principal negative radical is $B_4O_7^{--}$
J *Nitrate* waters, the principal negative ion is NO_3^-
K *Phosphate* waters, the principal negative ion is PO_4^{---}
L *Acid* waters, containing free acids
  a chiefly sulfuric acid
  b chiefly hydrochloric acid

(From Clarke, Data on Geochemistry) See *mineral waters*

w of constitution W which is chemically combined, as in hydroxides and acids **w of crystallization** W that is a physical constituent of crystals or hydrated salts, and may be removed at 100°C **w of hydration** *W of crystallization*, or *w of constitution*, cf *hydrates*

w analysis (1) Sanitary- The determination of the harmful constituents of water, both bacteriologically and chemically This includes determinations of the different types of nitrogen (ammoniacal n , albumenoid ammonia



Specific volumes of water

n , nitrite n , nitrate n), oxygen consumed, total solids, alkalinity, hardness and halogens Decaying vegetable and animal matter is indicated by the nitrogen present (2) Complete The determination of all inorganic constituents of w These methods are illustrated by the following analyses of the same sample (from F W Clarke, Data on Geochemistry)

(1) Results stated as oxides

SiO_2	0 891	*grains per gal*
SO_3	32 601	
CO_2	4 554	
Cl	2 681	
Na_2O	11 463	
K_2O	0 355	
CaO	13 117	
MgO	5 530	
$(FeAl)_2O_3$	0 189	
Mn_2O_3	0 189	
loss on ignition	2 397	
	73 967	
Less O = Cl	0 604	
	73 363	

(2) Results in terms of salts

$CaSO_4$	457 7	*parts per mill*
$MgSO_4$	236 0	
K_2SO_4	9 4	
Na_2SO_4	62 5	
NaCl	63 2	
Na_2CO_3	156 9	
Na_2SiO_3	21 9	
$(FeAl)_2O_3$	2 7	
Mn_2O_3	2 7	
loss on ignition	34 2	
excess SiO_2	1 3	
	1048 5	

(3) Results recorded in ions and radicals

SiO_2	1 26	*% of total solids*
SO_4^{--}	55 28	
CO_3^{--}	8 78	
Cl^-	3 79	
Na^+	12 02	
K^+	0 41	
Ca^{++}	13 24	
Mg^{++}	4 49	
R_2O_3	0 53	
	100 00	

Ignition loss (organic matter) is omitted Salinity 1014 parts

w bath A vessel of boiling water used in the laboratory to evaporate substances placed in a smaller vessel above it **w constants** The physical properties of ordinary water (Cf *heavy w*)

(a) density—greatest at 4°C , hence, one cc water at this temperature is taken as the unit of mass = 1 gram The density varies slightly with temperature

0°C	0 99987
1°C	0 99993
2°C	0 99997
3°C	0 99999
4°C	1 00000
5°C	0 99999
6°C	0 99997
7°C	0 99993
8°C	0 99988
9°C	0 99981
10°C	0 99973

(b) heat of fusion 79 calories per gram
(c) heat of vaporization 536 calories per gram
(d) specific heat
1 00477 at 5°C
1 00000 at 15°C
0 99765 at 25°C
0 99829 at 50°C
1 00001 at 60°C
1 00645 at 100°C

(e) critical temperature	370°C
(f) critical pressure	195 5 atm
(g) critical volume	2 33
(h) degree of ionization	10^{-7} moles per liter,

The concentration of hydrogen ions and hydroxyl ions is each 0 000 0001 gram per liter **w culture** An experimental method of growing plants by using alternately a nutrient 0 01 molar solution of KNO_3, $CaSO_4$ and $MgHPO_4$ with or without some other salt or ion in minute quantity Cf *bioelements, hydroponics, nutrient media, plant food* **w detection** Minute traces of water or moisture are recognized by (1) Potassium-lead iodide paper (filter paper saturated with a solution of potassium lead iodide in acetone), which becomes yellow (2) Anhydrous copper sulfate, which is colorless and turns blue **w distillation** The evaporation and condensation of w To remove all dissolved material distil in a quartz or silver vessel first from an alkaline solution of permanganate, then from sulfuric acid Cf *conductivity w* **w flowers** Ice flowers **w gas** A mixture of hydrogen and carbon monoxide, obtained by the action of steam on glowing coal **w glass** Sodium silicate **w metabolism** The daily balance of water in the human body, *e g*, in 24 hours

Intake	
solid food	700 cc
drinking water	600 cc
beverages	600 cc
metabolic water	300 cc
total	2200 cc

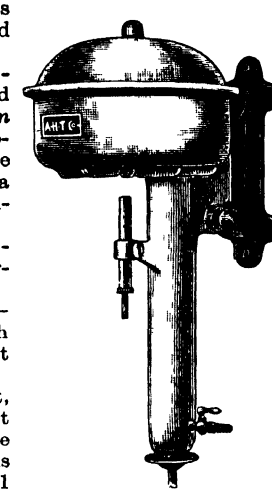
Output	
urine	800 cc
skin	700 cc
lungs	600 cc
feces	100 cc
total	2200 cc

w pollution The contamination of natural waters by the influx of wastes (q v) from sewage or an agricultural or industrial plant **w proof** Rain proof Impermeable to water See *india-rubber* **w purification** The more or less complete removal or destruction of salts or organisms which occur in natural waters, *e g*, by

softening	partial removal of salts
distillation	complete removal of salts
filtration	partial removal of organisms
sterilization	complete destruction of organisms

w softening The removal of Ca^{++} or Mg^{++} either by (a) filtration through permutite or natural zeolites, in which calcium ions are replaced by sodium ions, (b) heating, which removes Ca^{++} as calcium carbonate (boiler scale), (c) chemical treatment with lime, alumina, etc **w sterilization** The destruction of bacteria and spores by heat, or their removal in porcelain filters **w still** A device for the continuous production of distilled water (see illustration)

watermint The dried leaves of *Mentha aquatica*, a Labiatae, containing essential oils and tannin Used medicinally as an antispasmodic and stimulant



Water still

waterpepper Smartweed The dried herb of *Polygonum punctatum*, a Polygonaceae Used, as the fluid extract, as a stimulant and diuretic

waterproofing Making a substance impermeable to moisture

Watt, James 1736–1819 The Scottish inventor of the first steam engine (1769)

watt Ampere-volt, volt-ampere A unit of power, or time-rate at which work is done 1 watt = 1 joule (ten million ergs) per second, or the energy expended per second by an unvarying current of 1 ampere under a potential of 1 volt Conversion formulas

watts = volts × amperes = amp^2 × ohms = volts^2 ÷ ohms
1 kilowatt = 1000 watts
1 watt = $\frac{1}{746}$ horsepower
1 watt-hour = 3600 joules = 1 kelvin
1 kilowatt-hour = 3,600,000 joules

international watt- The energy expended per sec by an unvarying electric current of 1 international ampere under an electrical pressure of 1 international volt

wattage The amperage multiplied by the voltage

wattle gum Australian gum A gum from *Acacia pycnantha*, a Leguminosae of Australia and South Africa

Watts, Henry 1815–1884 An English chemist, noted as editor and author (*Journal of the Chemical Society* and *Dictionary of Chemistry*)

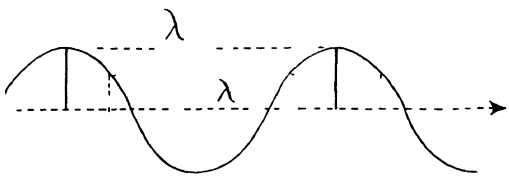
wave (1) A to-and-fro motion of the particles of a solid, liquid or gas (2) The harmonic curve obtained on plotting distance and time for points representing either particles or centers of force in rhythmic motion **longitudinal-** Forward and backward motion of particles in the direction in which the wave moves, as sound waves in air **transverse-** Up and down motion, or motion at right angles to the direction in which the wave moves Cf *radiations, electromagnetic-*

w front The surface of propagation, at right angles to the direction of motion, which passes through corresponding points of a number of waves **w function** The factor ψ in Schrodinger's equation, q v **w length** The distance between corresponding points on two adjacent waves (For wavelength of radiations see *spectrum*, of sound, see *sound*) **w mechanics** Quantum mechanics A mathematical theory which aims to explain the velocity (v) and position (p) of electrons from statistical determinations, where one value (*e g*, v) can be determined and the other (*e g*, p) is undeterminable, by predicting the probable range of values It is assumed that the motion of each

particle of mass (m) is associated with a wave of wave-length λ, and that $\lambda = h/mv$, also $mc^2 = h\nu$, where c is the velocity of light The velocity of the wave is $\mu = \lambda\nu$ Cf *Heisenberg principle* The λ of any line is related to the corresponding energy change (in volts) by $\lambda = 12{,}336/V$, thus for sodium in the lowest energy state, 3s, the following transition is possible

	λ_c	λ_a
to 3p, absorbing 2 09 V	= 5901	or 5896
to 4p, absorbing 3 73 V	= 3310	or 3303
to 5p, absorbing 4 32 V	= 2860	or 2853

where the calculated lines, λ_c, agree fairly well with the actual lines, λ_a **w motion** The progressive disturbance of particles in a medium The speed with which this disturbance is propagated is the velocity of the wave, c, this depends on the wave-length, λ, and the time period, T or on the frequency, ν, hence $c = \lambda/T$, $= \nu\lambda$, and $\nu = c/\lambda$ **w number** The number of waves per unit length, for light, $n = 1/\lambda$ (if λ is measured in cm), or $n = 10^8/\lambda$ (if λ is measured in Angstrom units) where n is the number of waves per centimeter Cf *Ritz formula* **w theory** Radiations comprise a moving electric (E) and magnetic (M) field at right angles to each other, and in the direction of propagation Cf *quantum theory*



Wave theory

The vector (E) is accompanied by (M) at right ngles Wave-length (λ) is the distance betwcen oints having the same magnitude of force requency (ν) is the number of oscillations in unit ime at a given point

'avellite $Al_3(OH\ F)_3(PO_4)_2$ A native aluminum phosphate, containing some fluorine

'ax (1) A material consisting of mixtures of esters, fatty acids, high atomic alcohols and even hydrocarbons Cf *sterols* (2) One of a group of plastic substances obtained from plants or deposited by insects, which consists of the esters of fatty acids with high-atomic alcohol radicals, as,

bees-wax	myricyl palmitate,	$C_{30}H_{61}$ - $C_{16}H_{31}O_2$
spermaceti	cetyl palmitate,	$C_{16}H_{33}$ - $C_{16}H_{31}O_2$

Waxes differ from fats in that they are the esters of monohydric, high-atomic alcohols, whereas, fats are the esters of trihydric, low-atomic alcohols (as glycerol) **bees-** See *beeswax* **carnauba-** See *carnauba wax* **Chinese-** q v **C K - seekay-** A synthetic wax prepared by chlorinating naphthalene **cochineal-** Coccerin **earth-** Ceresin **fossil-** Ozokerite **insect-** Chinese- **Japan-** q v **Java-** Ceryl alcohol **mineral-** Paraffin- **montan-** q v **palm-** q v **paraffin-** q v **peat-** See *peat* **pisang-** q v **sealing-** q v **sugar cane-** Cerosin **white-** Cera alba A bleached beeswax **yellow-** Cera flava Beeswax A soft yellow solid, obtained by melting and purifying the honeycombs of the bee, insoluble in water, slightly soluble in alcohol, soluble in ether, chloroform or oils **wool-** See *wool fat*

w tailings The residual product remaining after the destructive distillation of petroleum, it consists of the solid hydrocarbons, chrysene, picene and other products It resembles asphalt, and is used for waterproofing and as a filler in cheap greases

weak (1) Not strong (2) Not ionizing greatly **w acid** An acid that does not ionize greatly **w base** A base which does not ionize greatly **w salt** A salt that does not greatly ionize Cf *ionization*

weathering Describing group of chemical reactions which change the composition of rocks such as the effect of air, water, bacteria, and the physical action of heat and freezing which disintegrate the rock

weber Coulomb

Weber's law The sensation is proportional to the natural logarithm of the stimulus, the increase of a stimulus necessary to cause an increase in sensation is a constant fraction of the whole stimulus

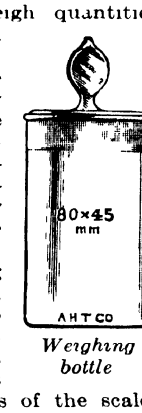
websterite $Al\ SiO_6, 9H_2O$ A native hydrous aluminum silicate Cf *cecilose*

wedge A solid object with a triangular section used to separate surfaces by the forcible introduction of the pointed end **w photometer** A photometer in which the illuminations on two faces of a wedge are matched

Weigert effect The dichroism shown by a colloidal suspension or gel

weighing The act of measuring the gravitational attraction of an object **double-** A method of finding the weight of an object independently of any variation in length of the two balance arms If the object weighs *a* when placed on one pan, and *b* when on the other, then the weight is given by $\sqrt{ab}$

w bottle A small, stoppered thin-walled, light glass vessel, used to weigh quantities of a substance for analytical purposes **w by substitution** A method used to obtain the weight of an object independently of the lengths of the arms of the balance The object is counterpoised by lead shot, then removed, and the lead shot counterpoised by weights **w by swings** A method in which the lack of sensitiveness of the balance is compensated by noting the swings of the balance-pointer, and the distances traversed to left and right The equivalent in milligrams of a fraction of a division on the pointer-scale is then calculated from the means of the scale-divisions of a number of swings on each side, and thence that also of the mean of the swings on both sides



Weighing bottle

weight The degree of heaviness or the force with which a body is attracted by the earth It differs according to the geographical location, cf *mass* **atomic-** The relative weight of an atom of an element as compared with an atom of hydrogen **carrier-** The weight of

substance (*e.g.*, protein) which carries 1 gm.-equivalent of prosthetic groups. **combining-** Equivalent weight. **equivalent-** The weight of a substance that can combine with or displace one unit-weight of hydrogen, or its equivalent of another substance. **isotopic-** The relative mass of an isotope, q.v.; it approaches a whole number. **molecular-** The sum of the atomic weights of the atoms contained in a compound. **specific-** See *specific gravity*.

w. buret. A small bottle with a tap and jet, used for accurate titration. The bottle is weighed before and after titration in order to determine the weight (instead of the volume) of the titrating solution used. **w. concentration.** The number of gm. of substance per kg. of solution. **w. normality.** Normality expressed per kg. instead of per liter.

weights. The units of weight in common use are:

A. METRIC WEIGHTS

Milligram	*Gram*	*Kilogram*	*Ton*	
1	0.001	10^{-6}	10^{-9}	0.015 grain
1000	1	0.001	10^{-6}	15.4 grains
10^6	1000	1	0.001	2.2 pounds
10^9	10^6	1000	1	1.1 ton

B. APOTHECARIES' WEIGHTS

Troy grains	*Scruples*	*Drams*	*Troy-ounces*	*Pound*	*Grams*
20	1	0.33	0.0417	0.00347	1.296
60	3	1	0.125	0.01042	3.888
480	24	8	1	0.833	31.035
5760	288	96	12	1	373.242

C. AVOIRDUPOIS WEIGHTS

Troy grains	*Drams*	*Ounces*	*Pound*	*Grams*
27.347	1	0.0625	0.0039	1.772
437.5	16	1	0.0625	28.35
7000	256	16	1	453.63

D. TROY WEIGHTS

Troy grains	*Pennyweights*	*Ounces*	*Pound*	*Grams*
24	1	0.05	0.0042	1.555
480	20	1	0.833	31.104
5760	240	12	1	373.2417

Weil-Felix reaction. An agglutination test for diagnosing typhoid fever.

weinschenkite. $(YEr)PO_4.2H_2O$. A native rare earth phosphate, resembling gypsum in structure.

weissite. Cu_5Te_3. Telluride. Lens-shaped crystals in veins of pyrites.

weld. To join metals by pressure at a temperature somewhat below that of complete fusion. **dyers-** A yellow dye obtained from *Reseda lutea*.

welding. (1) The joining of metals by heat; as: (a) **plastic-** united by pressure without a weld metal (forge, electrical resistance heater or thermite); (b) **fluid-** united by a weld metal without pressure (torch, arc or thermite). (2) To heat a metal to white heat and press the pieces together; or to heat a metal to fusion and let it flow into the joint. Cf. *thermite* process. **cold-** To hammer metal foils together into a compact piece; as, gold-foil restorations in dentistry. **spot-** Fluid welding at adjacent spots, which are subsequently run together by heat to form a continuous weld.

Weldon, Walter 1832–1885. An English industrial chemist, noted for his industrial processes. **W. process.** The manufacture of chlorine from hydrochloric acid by the action of manganese dioxide, and the regeneration of the W. mud by treatment with lime, followed by reoxidation to manganese dioxide. **W. mud.** The slime containing manganese and calcium manganites obtained in the Weldon process.

Welsbach, Carl Freiherr Auer von. 1858–1929. An Austrian chemist noted for his studies of the rare earths. **W. mantles.** Incandescent gas mantles, which consist of cellulose impregnated with cerium and thorium nitrates. On ignition a mixture of **ceria (1 %)** and thoria (99 %), remains.

Welter's rule. The heat of combustion of an organic compound is obtained approximately by subtracting the oxygen and hydrogen in the proportion of H_2O, and then adding the heats of combustion of the residual carbon and hydrogen atoms.

weltformat. A standard size for publications proposed by Ostwald, 16 × 22.6 cm. (about 6¼ × 9 inches, or the size of *Chemical Abstracts*).

welvic. Trade name for a polyvinyl type plastic.

Wenzel's law. Richter's law.

Werner, Alfred. 1866–1919. A Swiss chemist noted for his theories of the constitution of

Alfred Werner.

complex compounds; Nobel prize-winner (1923). **W.'s theory.** The affinity of an atom is an attractive force toward the center of the atom evenly distributed over its spherical shell. Valence numbers are the empirical numerical proportions in which atoms combine, and depend on the nature of the combining elements. In a combination of two atoms, the attractive force concentrates itself in a definite area, and this distribution is dependent on the nature of the combining atoms and may vary within wide limits. Thus, "in compounds such as H_2O and SO_3 the principal valencies of the atoms are saturated, and the molecules are incapable of uniting with another univalent atom. By reason of the residual valencies

however, the two molecules may combine, forming probably first an association held together by residual valencies (OH$_2$)

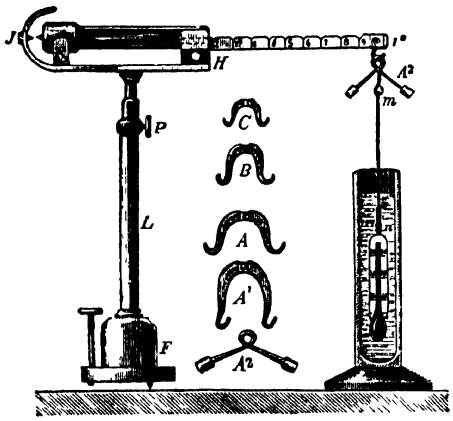
When association has occurred, the affinities may redistribute themselves uniformly with the formation of radicals (such as SO_4) having affinities capable of binding univalent atoms (such as 2H) to form H_2SO_4 Such hydrogen atoms exist outside the sphere of the complex radical SO_4, and are therefore easily split off in solution as ions In this way *e g* , the curious behavior of the chlorine atoms in chloroplatinic acid, H_2PtCl_6, is explained " (Partington "Inorganic Chemistry ") Cf *coordination number, coordination hypothesis*

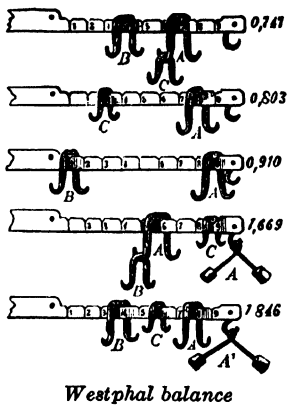
wernerite Scapolite

Wesson tube An absorption tube for carbon dioxide, containing soda-lime and calcium chloride

West, Clarence Jay 1886– An American chemist noted for chemical literature

Weston, Edward 1850–1936 An English-born American electrical engineer **W normal cell** Cadmium cell





Westphal balance

Westphal balance A beam balance for determining the specific gravity of liquids and solids (see illustration)

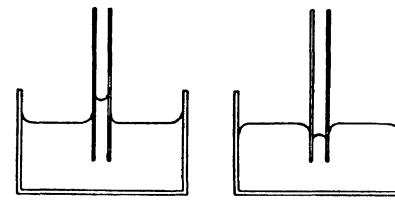
westron Carbon tetrachloride

wet Moist **w analysis** Qualitative analysis by means of reagents in solutions, as compared with dry, or blow-pipe, analysis **w bulb thermometer** Psychrometer **w. combustion** A method of determining organic carbon with chromic acid, or other liquid reagents **w process** An industrial method involving solutions, as, metallurgy, and the extraction of ores by acids or solvents

wetness See *freeness*

wettability The degree of wetting of a solid by a liquid, measured by the adhesion tension between a solid and liquid phase Cf *introfaction, zone*

wetting The adhesion of a liquid on to a surface Cf *flotation, adhesion, tension, introfier*



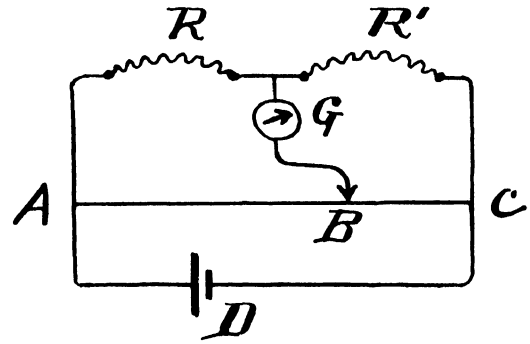
A = *Wetting* B = *Non-wetting*

whale An aquatic ammal of the order *Cetaceae* **w bone** Baleen The horny, elastic substance from the upper jaw of the Greenland whale **w guano, w meal** A fertilizer made from dried and ground w meat, containing 6–8 % N, 4–8 % P_2O_5 **w oil** Blubber oil An oil from whales, d 0 92–0 93, used as a leather dressing, lubricant, illuminant, and for soap manufacture **w shot** Crude spermaceti

wheat The seeds of *Triticum* species, Gramineae, used as food The world output in 1941 was 183,000,000 long tons grown in U S S R > U S > China > Canada > India > Argentina > France and other countries The chief varieties are

T monococcum	one-grained w
T polonicum	Polish w
T sativum	common w
T durum	flint w
T turgidum	rivet w
T compactum	dwarf w

Wheatstone, Sir Charles 1802–1875 An English physicist, noted for his electrical devices



W bridge An instrument, for the measurement of electrical resistance (see diagram) A point *B* on the graduated resistance wire, *AC* is found such that no current flows through a galvanometer *G* from the accumulator *D* The

ratio of the lengths *AB/BC* then equals the ratio of the resistances R/R', of which one is known The other may then be calculated

whey Milk serum The thin liquid remaining after the fat and casein have been removed from milk

whisk(e)y A grain spirit obtained from malted barley or other cereal by mashing and fermentation, followed by distillation and ageing

white A color (q v) produced by the reflection of all the visible rays, or of two complementary rays **w agate** Chalcedony **w antimony** Valentinite **w arsenic** Arsenous oxide **w ash** The dried bark of *Fraxinus americana*, an Oleaceae, used medicinally, as fluid extract **w bole** Kaolin **w bryony** Bryonia The dried roots of *Bryonia alba*, used medicinally as a cathartic **w cedar** Thuja **w coal** Water power, power obtained from hydroelectric plants **w lead** A basic lead carbonate, used as a white pigment **e lead ore** Cerussite **w lead paper** A filter paper impregnated with lead carbonate **w mustard** Sinapis alba **w nickel ore** $NiAs_2$ A native nickel arsenide **w oak** Quercus **w olivine** Forsterite **w pigments** An opaque and colorless pigment, as lead carbonate sulfate or oxychloride, barium sulfate, zinc sulfide, kaolin, lithopone or titanium oxide **w pine** Pinus alba The dried bark of *Pinus strobus*, a Pinaceae, used medicinally as an expectorant **w pond lily** The dried roots of *Castalia odorata*, a Salicaceae, used, as the fluid extract, as an astringent **w poplar** The dried bark of *Populus tremuloides*, a Nymphaceae, used medicinally as a tonic and febrifuge **w precipitate** Ammoniated mercury **w olivine** Forsterite **w vitriol** Zinc sulfate **w wash** A suspension of chalk in water, used for decorative purposes **w zinc** Zinc oxide

whiting Whitening A washed chalk or calcium carbonate, used as a pigment for polishing

whitlockite $Ca_3(PO_4)_2$ A late hydrothermal mineral in New Hampshire granite pegmatites

Whitney, Willis Rodney 1868– An American physicist, noted for his work on colloids

whitneyite Cu_9As A native copper arsenide

whortleberry Vaccinium

widia (from the German "*wie diamant*") Cemented tungsten carbide

Wiedemann, Gustaf Heinrich 1828– A German physical chemist, noted as editor of *Poggendorff's Annalen* **W-Franz's law** The *thermal* and *electrical* conductivities of the metals follow the same order

Wieland, Heinrich 1877– A German chemist and Nobel Prize winner (1927), noted for biochemical research (bile acids, chlorophyll and hemoglobin)

Wien, Wilhelm 1864–1928 A German physicist noted for his research on spectra and radiations **W constant** The constants, c_1 and c_2 in W 's equation of radiation, $c_2 = 1.4312$ **W equation** The intensity, I, of a radiation is given by $I = c_1\lambda^{-5} e^{c_2/\lambda T}$, where λ is the wave-length, and T the absolute temperature, e the base of natural logarithms and c_1, c_2 are constants **W law** From a perfect radiator energy radiates over a wide range of temperature, but the intensity is a maximum for a certain wave-length, λ_m, depending upon the absolute temperature, T Measured in centimeters, $\lambda_m = 0.289/T$, hence, the higher the temperature, the shorter is the wave-length of maximum intensity

Wijs solution A solution of iodine monochloride in glacial acetic acid, used for the determination of iodine values **W value** Iodine number

wild (1) In pharmacy, not cultivated (plants), not domesticated (animals) (2) In metallurgy, over-oxidized, as, steel which will spit and fly owing to the escape of gases **w cherry** Prunus virginiana The stem bark of *Prunus serotina*, a Rosaceae, it is used medicinally, as the fluid extract, as a sedative and expectorant **w ginger** Asarum **w hyssop** Verbena **w indigo** Baptisia **w licorice** Abrus **w mint** *Mentha canadensis*, a plant resembling pennyroyal **w rosemary** q v **w rue** Harmel **w yam** Dioscorea

Wiley, Harvey Washington 1844–1930 An American chemist, noted for his work on food laws

Will, Heinrich 1812–1890 A German chemist, noted for analytical methods

willemite Zn_2SiO_4 A native zinc silicate

willesden goods Articles made by impregnating paper or pulp in cupra-ammonium solution, washing, rolling, or pressing into a shape (*e g* , in several layers) and drying They include small cheap articles such as picnic plates and spoons, combs, etc and are hard and relatively water-resistant

Williamson, Alexander Edward 1824–1904 An English chemist, noted as founder of the molecule concept **W reaction** The synthesis of ethers from sodium alcoholate and an alkyl-iodide $RI + NaOR' \rightarrow ROR' + NaI$ **W 's violet** $KFe[Fe(CN)_6]\,2H_2O$ A potassium ferric ferrous cyanide

willow A genus of trees of the order Salicaceae, the bark and leaves contain salicin

Willstätter, Richard 1872–1942 A German chemist and Nobel Prize winner (1925), noted for organic research particularly on plant pigments

wilnite A pale green variety of grossularite See aluminum *garnet*

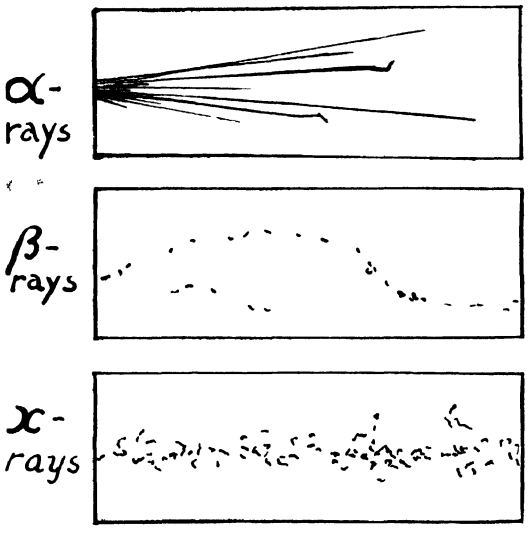
Wilson, Charles Thomas Rees 1869– An English physicist noted for his experimental methods of studying atomic effects **W method** The fog condensation method which enables one to demonstrate and record the motions of atomic fragments by observing or photographing their path in a low-pressure fog chamber (the cloud-track apparatus) The charged ions or electrons cause condensation of the gaseous water molecules, and become visible as minute droplets **W tracks** When α-, β-, γ- or x-rays are shot into a low-pressure fog chamber they cause condensation of single microscopic droplets, which appear as lines and can be photographed or kinematographed, used in the study of atomic structure (see illustrations)

winchester A bottle of standard cylindrical shape, which is tall and has a relatively small base **w bushel** See U S A bushel **w quart** A w bottle which holds from 2¼ to 2½ liter

wind gage Anemometer

Windaus, Adolf 1876– A German chemist, and Nobel Prize winner for his work on sterols

window An aperture in the glass of a vacuum tube which is closed with aluminum, or other metallic foil permitting the exit of cathode **rays.**



Wilson tracks
Showing the path of nuclei, electrons and ions

wine Fermented grape juice, containing 6–22 % alcohol, traces of oenanthic and other ethers, essential oils, grape sugar, glycerol, tannic, malic, phosphoric and acetic acids, tartrates of potassium and calcium, coloring matters and some proteins It is the result of the natural fermentation of grape juice, and exists in a great variety of types **dry-** W of low sugar content, as, Sauterne, Burgundy **fortified-** W to which alcohol has been added **medicated-** W to which a medicament (*e g* , meat extract) has been added **sour-** W which has begun to ferment to acetic acid **spirit of-** Ethanol **sweet-** W of high sugar content, as, sherry or port

wine-glass An approximate liquid measure, equal to 60 cc or 2 fluid ounces

wing top A triangular shaped attachment to the bunsen burner for producing a long and narrow flame

Winkler, Clemens Alexander (1838–1904) A German chemist, who discovered germanium and was noted for his work in gas analysis and mineralogical chemistry

winterene $C_{15}H_{24}$ = 204 2 A hydrocarbon found in the essential oil of winter's bark

wintergreen Gaultheria **bitter-** Chimaphila **w oil** The essential oil of *Gaultheria* species, d 1 175–1 187, which contains 99 % methyl salicylate *artificial-* Methylsalicylate

winter's bark The dried bark of *Drimys winteri*, a Magnoliaceae containing an essential oil, tannin and resin, used medicinally as an aromatic and stomachic Cf *drimin*

wipla [from the German "*wie platin*"] A chromium-nickel steel, used as a platinum substitute in dentistry

wire A metal or other rod drawn out to a high degree of fineness **cross-** Two thin crossing wires placed in the objective of an optical instrument to enable the position of the object under examination to be fixed

wiring An electrical circuit

Wislicenus, Johannes 1835–1902 A German chemist noted for his work on stereochemistry, lactic acid and aceto-acetic ester isomerism

wismuth Bismuth

wistarin A crystalline glucoside from *Wistaria chinensis*, a Leguminosae

witchhazel Hamamelis

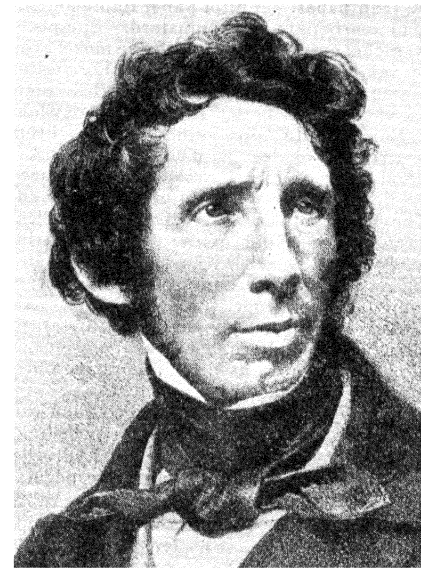
withania The plant *W somnifera*, geneesblaar, vimba, a Solanaceae of South Africa, used by natives as an antiseptic and hypnotic It contains somnirol, somnitol, withaniol, etc

withanic acid $C_{30}H_{46}O_8$ = 534 35 A monobasic acid from withania

withaniol $C_{15}H_{34}O_5$ = 534 25 A monohydric alcohol from withania

witherite $BaCO_3$ A native barium carbonate, d 4 29–4 35, hardness 3–3 75, used in the glass and sugar industries, and in pyrotechnics

witness A tube which usually contains calcium chloride and is placed at the beginning or end of a gas train, it is weighed at the beginning and end of the experiment, and indicates any loss of solvent sustained by the absorption bulbs (cf *guard-tube*)



(From Muldoon "Organic Chemistry")

Witt's color theory Certain (chromophoric) linkages in organic compounds induce color If a compound contains in addition certain other (auxochromic) linkages, a dyestuff is produced A colored compound is known as a chromogen

woad An early dye made from the Cruciferae, *Isatis tinctoria*, of the Mediterranean region, its leaves are ground to a paste and fermented Used as a blue dye before indigo was known in Europe, and the ancient Britons stained themselves with it

Woestyn's law Joule's Law

Wohler, Friedrich 1800–1882 A German chemist, noted for his isolation of aluminum and beryllium, discovery of isomerism and the first synthesis of an organic compound (urea) in 1828 **W 's law** A dynamic deformation of a material may take place as a result of vibrations, none of which attains the breaking limit, ultimately they may result in rupture

wohlerite A native mixture of oxides of sodium, calcium, niobium silicon and zirconium

Wohl's reaction Boiling with ammoniacal silver nitrate hydrolyzes acetyl groups and eliminates HCN from the oxime of an acetylated sugar

$$R\,CHOAc\,CN \rightarrow R\,CHOH\,CN \rightarrow R\,CHO + HCN$$

Wohlwill process The electrolytic refining of gold from a weak acid solution

Wolf process A flotation process involving the use of sulfo-chlorated oils

wolfatite A German trade name for phenol-formaldehyde and amino plastics having exchange-adsorption properties (cf *zeolites*) Used for water purification and the recovery of copper from waste cuprammonium liquors

Wolffram's salt The platinum chloride, $[PtCl]$-$Cl_2(H_2O)_n$, used as microchemical reagent

Wolf-Rayet type A spectrum which shows wide emission lines, class O of stellar spectra, q v

wolfram (1) Tungsten (2) Wolframite w **ocher** Tungstite

wolframate Tungstate

wolframine Tungstite

wolframites A group of iron and manganese tungstates of the general formula, (Fe,Mn)-WO_4, intermediate between ferberite, $FeWO_4$ and hubernite, $MnWO_4$

wolframium Tungsten

wolfsbane (1) See *arnica flowers*

wolfsbergite (1) Chalcostibite (2) Essonite

Wollaston, William 1766–1828 An English physicist and chemist who discovered palladium and rhodium, and investigated the wave-theory of light **W wires** Fine platinum wires (0 001 mm diameter) drawn inside a silver sheath, which is subsequently removed in nitric acid

wollastonite $CaSiO_3$ Tabular spar, scale stone A native triclinic calcium silicate of the pyroxene group **para-** The monoclinic form of w **pseudo-** A third modification of w

Wolpert's air tester See *air tester*

wondrpack An oral surgical dressing 70 % zinc oxide, 30 % rosin and 0 625 % asbestos, made into a paste with 80 % oil of cloves and 20 % olive oil

wood The dried stem or the structural and supporting part of a tree or shrub Its chief constituent is cellulose, cf *lignin, lignoceric acid, lignone, lignose, xylose* The following woods are official (U S P)

Dulcamara	Quassia
Guaiacum	Red Sanders
Hematoxylon	

Commercial woods may be classified

Soft woods	
Pine	*Pinus* species
Spruce	*Picea* species
Hemlock	*Tsuga* species
Fir	*Abies* species
Redwood	*Sequoia sempervirens*
Cedar	*Thuja* and *juniperus* species
Hard woods	
Poplar	*Populus* species
Oak	*Quercus* species
Linden	*Tilia* species
Maple	*Acer* species
Birch	*Betula* species
Sycamore	*Plantans* and *Acer* species
Beech	*Fagus* species
Chestnut	*Castanea* species
Walnut	*Juglans* species
Ash	*Fraxinus* species
Hickory	*Hicoria* or *Carya* species
Elm	*Ulmus* species
Cabinet woods	
Mahogany	*Khaya* species
Teak	*Tectona grandis*
Ebony	*Diospyros* species
Rosewood	*Dalbergia* species

w alcohol Methanol **w ashes** The residue remaining from burning wood, and containing 4 % K_2O, used as fertilizer **w cellulose** Xylon Cellulose obtained from wood **w charcoal** Carbo lignis **w extract** The waste liquor from the cooking of wood with alkali or sulfite liquor to make pulp **w flour** W meal, sawdust, pulverized w A finely-powdered wood, generally white pine Used as a filler in moldings, linoleum, flooring, rubber, soap, and as absorbent for nitroglycerin (dynamite) **w free** Describing a paper which contains no groundwood pulp, and which usually contains only chemical wood pulp **w march** Sanicula **w meal** W flour **w metal** See *Wood's alloy* **w naphtha** Methanol **w oil** Tung oil **w opal** Xylopal Fossilized wood, in which silica replaces the woody fibers **w preservative** A preparation (*e g* , tar or creosote) to make w withstand the effects of moisture and bacteria **w pulp** (Cf *wood flour, pulpwood*) A mechanically-ground or chemically-digested wood used in the manufacture of paper or rayon **w spirit** Methanol **w stain** See *table top impregnation* **w stone** Xylolith **w sugar** Xylose **w tar** See *tar* **w vinegar** See *pyroligneous acid* **w waste** The materials made from lumber-"waste " such as

wood pulp (for paper, twine, yarn, rayon),
wood flour (dynamite, linoleum, plastics),
ethyl alcohol, motor fuels,
cattle food and carbohydrates
rosins, turpentine, pine oil and tar
tannin, fatty acids, dyes and potash

Wood's alloy A low melting-point alloy (65 5°C), 5 pts bismuth, 2 5 pts lead, 1 25 pts tin and 1 25 pts cadmium **W glass** A glass which absorbs most of the visible spectrum, but transmits a band of waves in the ultra-violet **W light** The filtered rays of the mercury vapor lamp of wave-length 3340–3906 A U

woodwardite $CuSO_4,Al_2(SO_4)_2,H_2O$ Native copper aluminum sulfate

wool The fibrous hair of lambs and sheep It contains keratin (which has a characteristic odor on burning), and about 40 % of a grease (chiefly cholesterol) It is similar in composition to horn, and is attacked by alkali, but not by acids **casein-** Lanital **glass-** Fine glass threads used for filtering **mineral-** See *mineral* **w fat** (1) Lanolin (2) The wax alcohols extracted from pure wool fat on the commercial scale **w waste** A fertilizer material and by-product of w carding, consisting of sheep manure, seeds and wool fibers, 3–6 % N_2

Woolwich viscosity See *viscosity*

woorara Curare

work Work is performed when a force moves its point of application It is measured by the product of the force and the distance it is displaced in the direction of the force Units F P S system—1 foot-pound, *i e* , the work done when 1 pound is lifted one foot against gravity

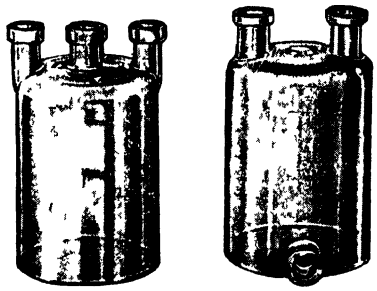
Metric system—1 centimeter-dyne = 1 erg Gravitational unit—1 gram and 1 cm = g dyne cms = g ergs Dimensions—FL = ML^2T^{-2} For rate of work, see *power* **w of expansion** The resistance offered by the molecules of an expanding gas, due to molecular attraction

wormseed (1) Santonica (2) Chenopodium **w oil** *American* The essential oil from *Chenopodium ambrosioides*, d 0 960–0 980 *Levant* The oil of *Artemisia maritima*, d 0 930, containing cineol

wormwood Absinthium **salt of-** Potassium carbonate **w oil** Absinthe oil An essential oil from the herb of *Artemisia absinthium* A greenish volatile liquid, d 0 925–0 955, soluble in alcohol, containing chiefly thujone, phenandrene and thujyl alcohol

wort Any infusion of a plant or part of a plant that is to be fermented, as beer-wort

Woulfe bottle A two or three-necked bottle which is used frequently in chemical experiments It was first described by Peter Woulfe in 1784



Woulfe bottles

W-rays See *W*

Wright's stain A microscope stain for white blood corpuscles, consisting of 1 gram of specially prepared methylene-blue-eosine mixture in 600 cc of methanol

wrightine Conessine

Wroblewski, Sigismund A von 1845–1888 A Polish physicist, noted for the liquefaction of gases

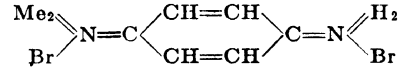
wrought iron A pure grade of iron with a low carbon content

Wu, Lu-Chiang 1904–1936 A Chinese chemist, noted for historical research

wulfenite $PbMoO_4$ Yellow lead ore A native lead molybdate

Wullner's law The lowering of the vapor pressure of water by a solute is proportional to the concentration of the solute

Wurster's blue An oxidation-product of tetramethyl-*p*-phenylene diamine, used as an indicator **W red** An oxidation-product of *p*-amino-dimethylaniline It is considered to be a meriquinone



Wurtz, Carl Adolphe 1817–1884 A French chemist, noted for organic research and his statement *"La Chimie est une science française"* **W flask** A distillation flask with a side-arm in the neck **W's reaction** The synthesis of hydrocarbons by treating alkyl iodides in ethereal solution with sodium $2MeI + 2Na = Me\,Me + 2NaI$

wurtzite ZnS Aegerite A native zinc sulfide, differing from sphalerite in its hexagonal structure

wyomingite A porous rock found in the Leucite Hills, Southern Wyoming, from which potash is extracted by acid treatment It contains 11 % K_2O

Wysor machine A device for grinding and polishing metals for metallographic examinations

X

X (1) The symbol for xenon (2) In a formula the symbol for a halogen or acid radical, as HX

x The symbol for (1) an unknown quantity, (2) molecular fraction **x-axis** The first dimension in coordinates, q v **x-ray** See below **x-unit** See below

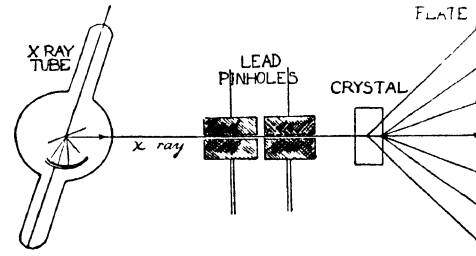
χ The Greek letter "chi"

ξ The Greek letter "xi"

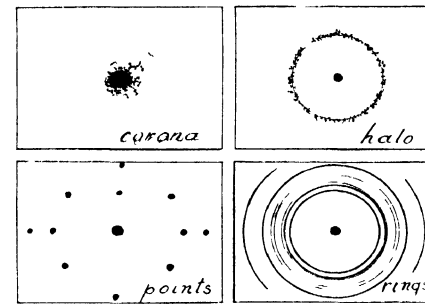
x-rays Rontgen rays A non-luminous radiation (q v) or invisible light rays of extremely short wave-lengths, ranging from 0 06 to 2 Å U, which are produced in an x-ray tube (q v) by cathode rays focused upon a metal surface They resemble the gamma-rays of radioactive substances, and are made visible by fluorescent screens or photographic plates Their *quantity* is determined with Eder's solution, their *intensity* is expressed in Rontgen units Cf *spectrum, radiations* **hard-** X-rays of relatively high penetration and short wave-length, 0 19 to 0 43 Å U, which decrease in wave-length as they traverse a medium **heterogeneous-** See *multifrequent-* **homogeneous-** See *monochromatic-* **infra-** Grenz rays **monochromatic-** Unifrequent-, homogeneous- X-rays consisting of rays of a single wave-length or a group of wave-lengths, depending upon the nature of the target The shortest measured is 0 1075 Å U for the K-line of uranium, the longest 17 66 Å U for the $L\beta$ line of iron **multifrequent-** Heterogenous-, polychromatic X-rays consisting of rays of many different wave-lengths **polychromatic-** Multifrequent- **soft-** X-rays of relatively low penetration and long wave-length 11 9 to 13 6 Å U, which increase in wave-length as they traverse a medium **ultra-** Cosmic rays **unifrequent-** Monochromatic- **white-** The common or ordinary x-rays, consisting of a band of many different wave-lengths Their limit depends on the voltage applied, and not on the nature of the target $Ve = h\nu_0 = hc/\lambda_0$, where V is the voltage, e the charge of an electron, h Planck's constant, c the velocity of light, λ_0 the maximum frequency and ν_0 the minimum wave-length

Type of x-rays	Average λ Å U	Voltage KV
high voltage	0 04	550
hard-	0 20	180
medium-	0 50	70
soft-	0 70	50
grenz rays	2 0	2 5

x-ray analysis The determination of the internal structure of a material by means of the diffraction pattern formed when an x-ray passes through it (see illustrations)



X-ray analysis



X-ray analysis pattern

corona or diffuse fog, indicating the gaseous state

halo, indicating a liquid or an amorphous substance, where the molecules are distributed in irregular or haphazard fashion (*e g*, unstretched rubber)

rings, indicating a regular space lattice with the molecules in definite positions and oriented to each other (*e g*, stretched rubber)

points, indicating a crystal, or regular space lattice in which the atoms, ions or molecules are fixed in definite positions

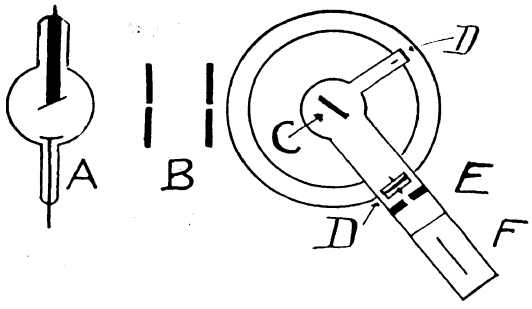
x-ray intensity unit (International standard, 1928) The Rontgen (r) The quantity of x-radiations which, when the secondary electrons are fully utilized and the wall-effect of the chamber avoided, produces in 1 cc of atmospheric air at 0°C and 760 mm pressure, such a degree of conductivity that one e s u charge is measured at saturation current

x-ray spectrogram A photographic record produced by the spectrograph, as, a crystallogram, q v

x-ray spectrograph A spectrometer fitted with a photographic camera

x-ray spectrometer. An arrangement for diffracting x-rays by using the space-lattice of a crystal as grating (see illustration)

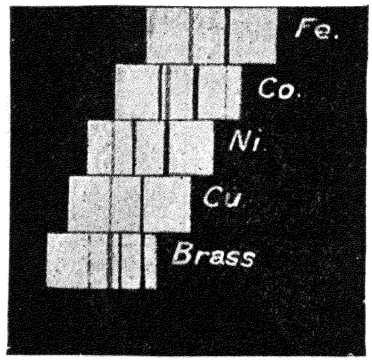
x-ray spectrum Moseley spectrum, high-frequency spectrum The spectrum produced (by a crystal diffraction grating) of the characteristic radiations emitted by the metal used as anticathode in an x-ray tube Each metal produces a few strong, characteristic lines,



X-ray spectrometer.

A—x-ray tube
B—lead slits
C—crystal
D—scale
E—lead slit
F—ionization chamber or photographic plate.

(see illustration) the square roots of the frequencies of which are in direct proportion to the atomic number of the element. It is used as a means of analysis.



X-ray spectrum.

x-ray structure. The structural arrangement of atoms in a crystal as revealed by the Laue pattern and crystallograms (q.v.) produced when x-rays pass through the crystal and fall on a photographic plate.

x-ray tube. A cathode tube or highly-evacuated tube containing three electrodes; namely, a disk concentric with the tube as cathode, a heavy, substantial and inclined plane of high melting-point metal as an anticathode, and a small wire as an anode (see illustration). The cathode rays concentrate on a small spot on the anticathode, which is heated by the bombardment of electrons and emits rays of very short wave-lengths.

x-unit. (1) A wave-length of 10^{-3} Å.U. (10^{-11} cm.). (2) More accurately, 1 x-unit = 1.00201 $\times$ 10^{-3} Å.U. (Craven).

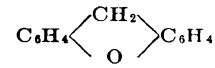
xanthaline. $C_{37}H_{36}O_9N_2$ = 652.4. An alkaloid, m.208, in opium.

xanthate. Xanthogenate. A salt of xanthic acid of the general type, EtO.CS.SM, or RO.CSSM, where M is a metal and R an alkyl radical; as, potassium ethylxanthate, EtO.CS.SK. Cf. *viscose.* **butyl-** Potassium *sec.*-butylxanthate, $MeCH_2.CHMeO.CS.SK$. An agent used in flotation as collector, giving 94 % mineral recovery. **ethyl-** Potassium ethyl xanthate, EtO.CS.SK. Used as a collector in flotation; 85 % of mineral recovery results. **propyl-** $MeCH_2CH_2O.CS.SK$. A flotation collector giving 90 % mineral recovery.

xanthein. A yellow coloring matter of plants, and a split-product of chlorophyll.

xanthematin. A yellow coloring matter and split-product of hemoglobin.

xanthene. $C_{13}H_{10}O$ = 182.1. Methylenediphenyleneoxide, dibenzo-*1.4*-pyran, diphenylenemethaneoxide,



Colorless leaflets, m.105, b.312; very slightly soluble in water, soluble in alcohol or ether. Cf. *xanthydrol.* **benzo-** See *benzoxanthene.* **dibenzo-** See *dibenzoxanthene.* **hydroxy-** Xanthydrol. **keto-** Xanthone. **thio-** Thioxanthene.

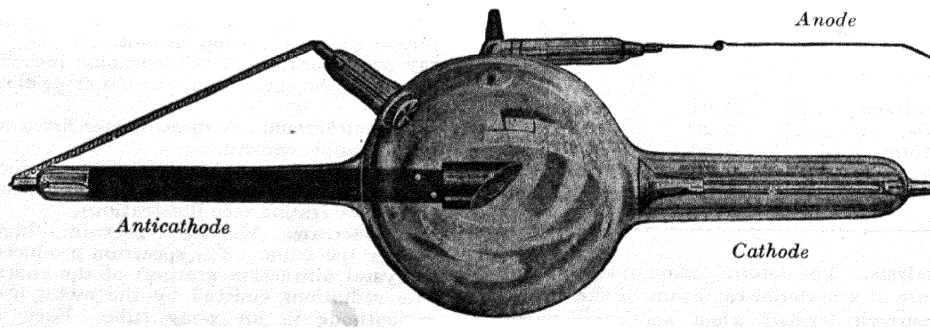
xanthenol. Xanthydrol.

xanthenone. Xanthone.

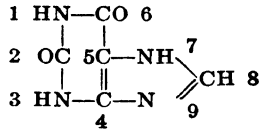
xanthic acid. $C_3H_6OS_2$ = 122.18. Xanthonic acid, xanthogenic acid, ethyloxydithiocarbonic acid, HO.CS.SEt or EtO.CS.SH. A very unstable, colorless, oily liquid, insoluble in water, decomp. to ethanol and carbon disulfide at 24°C. **x. amide.** C_3H_7ONS = 105.14. $NH_2.CS.OEt$, m.38, soluble in water, alcohol or ether. **x. disulfide.** $C_2H_2S_4O_2$ = 186.3. HO.CS.S.S.CS.OH. Colorless crystals, m.28.

-xanthin. A suffix indicating yellow; as, cox., fucox., tarax., violax., and zeax.

xanthin(e). $C_5H_4O_2N_4$ = 152.1. 2.6-Dioxypurine, 2,6-purinedione. A purine base in blood, liver, urine and some plants. A yellow crystalline powder, m.360, slightly soluble in water or alcohol, and soluble in ether. **allo-** Alloxantin. **dimethyl- 1.3-** Theophyl-



X-ray tube.



line **3 7- Theobromine 1 7- Paraxanthine hetero-** $C_6H_6O_2N_4$ = 166 1 7-Methyl-2 6-dioxypurine **hypo-** $C_5H_4ON_4$ = 136 1 6-Oxypurine **imido-** Guanine **methyl-** $C_6H_6O_2N_4$ = 166 1 1-Methyl-2 6-dioxypurine **para-** $C_7H_8O_2N_4$ = 196 2 1 7-Dimethyl-2 6-dioxypurine, an isomer of theophylline **pseudo-** Tauto- **tauto-** $C_5H_4O_2N_4$ = 152 1 Pseudoxanthine 2 6-Dihydroxypurine A tautomeric form of xanthine **tautohypo-** $C_5H_4ON_4$ = 136 1 A tautomeric form of hypoxanthine, q v **trimethyl-** Caffeine

x bases Alloxuric bases, purines A group of oxypurine derivatives in vegetable and animal tissues, *e g*, xanthine, hypoxanthine, uric acid, carnine, theophylline, caffeine, theobromine

xanthinine $C_4H_3O_2N_3$ = 125 05 A compound formed by heating ammonium thiourate

xanthium Spiny clotbur, cocklebur The herb of *Xanthium spinosum*, a Compositae, containing essential oils and resins, used medicinally as a diuretic *Cf xanthostrumarin*

xantho- A prefix derived from the Greek "yellow," indicating a yellow color of the compound, as in xanthocobaltic

xanthochelidonic acid $C_7H_6O_7$ = 202 0 Acetone dioxalic acid *2 4 6*-Dioxypimelic acid, *2 4 6*-triketopimelic acid, *2 4 6*-triketoheptanedioic acid, $CO(CH_2CO\,COOH)_2$ An unstable acid formed from chelidonic acid by treatment with excess alkali Its salts are yellow

xanthochromium The divalent group $Cr(NO_2)(NH_3)_5$ which forms salts

x bromide	$Cr(NO_2)(NH_3)_5Br_2$
x carbonate	$Cr(NO_2)(NH_3)_5CO_3$
x chloride	$Cr(NO_2)(NH_3)_5Cl_2$

The xanthochromates are usually soluble in water

xanthocobaltic The divalent group, $Co(NO_2)(NH_3)_5$, which forms yellow salts

x bromide	$Co(NO_2)(NH_3)_5Br_2$
x chloride	$Co(NO_2)(NH_3)_5Cl_2$
x chromate	$Co(NO_2)(NH_3)_5CrO_4$

The xanthocobaltates are usually soluble in water

xanthocreatinine $C_5H_{10}ON_4$ = 142 1 A yellow crystalline leukomaine resembling creatinine, in muscle tissues

xanthogenate A compound of the type $(RO\text{-}CS\,S\text{—})_2$ **diethyl-** $C_6H_{10}O_2S_4$ = 242 32 Bisethylxanthogene EtO CS S—S CS OEt A yellow liquid, b 92, used in oil solutions as an antiparasitic

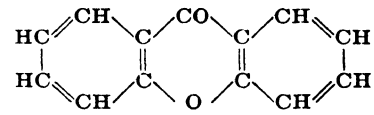
xanthogene A coloring material of plants, producing a yellow pigment with alkalis

xanthogenic acid Xanthic acid

xanthoglobulin Hypoxanthine

xantholine Santonica

xanthone $C_{13}H_8O_2$ = 196 1 Xanthene-ketone, ketodiphenyleneoxide, dibenzo-γ-pyrone xanthenone, 9-ketoxanthene Colorless crystals, m 173, b_{730mm} 350, slightly soluble in water



or alcohol, soluble in ether It is the nucleus of certain plant pigments, used in the synthesis of dyes (*e g*, euxanthone, India yellow) **dihydroxy- 1 7-** Euxanthone **3 8-** Isoeuxanthone **methoxydihydroxy-** Gentisin **naphtho-** Naphthoxanthone **thio-** See *thioxanthone*, **trihydroxy-** Gentisein

xanthonic acid Xanthic acid

xanthophyll $C_{40}H_{56}O_2$ = 568 4 A yellow vegetable pigment, m 192, similar to chlorophyll, which occurs in plants It is a polymer of isoprene and related to carotene, q v

xanthophyllite A native hydrous silicate of calcium, magnesium, iron and aluminum

xanthopicrin A yellow coloring matter from the bark of *Xanthoxylum caribaeum*, a Rutaceae

xanthopicrite A yellow resin from *Xanthoxylum* species

xanthoprotein reaction A reaction for proteins, in which a yellow substance is produced by boiling with nitric acid

xanthopterin The yellow pigment from the wings of the "brimstone" butterfly, family, *Pieridae*

xanthopuccine An alkaloid isolated from *Hydrastis canadensis* Cf *hydrastis*

xanthopurpurin $C_{14}H_6O_2(OH)_2$ = 240 13 1 3-Dihydroxy anthraquinone, purpuroxanthene A solid, m 263, soluble in alcohol

xanthorhamnin A glucoside and hydroxyflavone from buckthorn berries, *Rhamnus cathartica* Cf *rhamnoxanthin*

xanthorhodium The divalent group $Rh(NO_2)(NH_3)_5$, which forms a series of yellow salts

x bromide	$Rh(NO_2)(NH_3)_5Br_2$
x chloride	$Rh(NO_2)(NH_3)_5Cl_2$
x hydroxide	$Rh(NO_2)(NH_3)_5(OH)_2$

xanthorrhiza Yellow root The dried rhizome of *X apiifolia*, a Ranunculaceae, used medicinally as a bitter tonic

xanthosiderite $Fe_2O_3\,2H_2O$ A hydrated ferric oxide Fine, yellow, stellate needles

xanthosin $C_{10}H_{10}N_3O_6$ = 268 14 Xanthinriboside produced from guanosin by deamination

xanthostrumarin A glucoside from *Xanthium strumarium*, cocklebur, a Compositae Cf *xanthium*

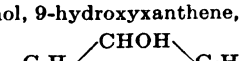
xanthoxylene $C_{10}H_{16}$ = 136 1 Xanthoxylin A terpene from the essential oil of *Xanthoxylum* species (Rutaceae)

xanthoxylin (1) An alcoholic extract of xanthoxylum (2) Xanthoxylene

xanthoxylone $C_{10}H_{12}O_4$ = 196 1 A crystalline principle from *Xanthoxylum*

xanthoxylum Prickly ash, yellow wood, angelica tree The dried bark of *X americanum*, *X officinalis* (Rutaceae) or other species, containing xanthoxylene, essential oils, tannin and resin Used medicinally, as fluid extract, as a diaphoretic and stimulant Cf *angelica tree*, *artar root*

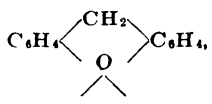
xanthydrol $C_{13}H_{10}O_2$ = 198 08 Diphenyleneoxycarbinol, 9-hydroxyxanthene,



Used as a reagent for urea Cf *xanthene*

xanthyl The monovalent radical, $C_{13}H_9O$—, derived from xanthene There are five isomers

xanthylium The radical



containing tetravalent oxygen, derived from xanthene

xaxa Acetylsalicylic acid

xaxaquin Quinine acetyl salicylate

xble Abbreviation for crucible

xe An obsolete symbol for xenon, X

xenene Biphenyl

xenol $C_{12}H_{10}O$ = 170 1 Xenenol, phenylphenol, PhC_6H_4OH **o-** White solid, used as an antiseptic **p-** White solid, used in the plastics industry to increase resistance to high temperatures and hot water

xenolite An aluminum silicate resembling fibrolite

xenon X or Xe = 131 3 A rare, heavy noble gas and element, atomic number 54, discovered by Ramsay and Travers, 1898, and named from the Greek, ξένος, strange It occurs in small traces in the atmosphere (5/100,000 %), and consists of nine isotopes A colorless gas $d_{(air-1)}$ 4 422, $d_{(gas/liquid)}$ 5 887, m −140, b −107 1, triple point at −111 5°C and 600 mm , insoluble in water and used in vacuum tubes

Xenophanes B C 576–480 A Greek philosopher of the Eleatic school, who suggested one of the earliest known theories of atomic structure which he believed to be continuous and completely filling space

xenotime YPO_4 A native yttrium phosphate, containing uranium and rare earth metals

xenyl The monovalent radical, PhC_6H_4— derived from diphenyl

x amine $C_{12}H_{11}N$ = 169 1 *p*-Biphenylamine, *p*-phenylaniline, martylamine, $PhC_6H_4NH_2$, commercial aniline White leaflets, d 1 160 m 53, b 302 Cf *diphenylamine*

xeroform. $Bi_2O_3(C_6H_2Br_3OH)$ = 796 8 Bismuth tribromphenol, bismuth tribromcarbolate A yellowish-green powder, insoluble in water, used medicinally as an intestinal antiseptic and iodoform substitute

xi The Greek letter ξ or Ξ

xiphidin A ptomaine from the sperm of the sword fish, containing 81 5 % arginine

xonotlite $5CaO\ 5SiO_2\ H_2O$ A constituent of boiler scales having a fibrous structure

xray See *x-ray*

xylan A hemicellulose in many trees and industrial wastes, *e g* , cotton seed hulls, corn cobs, corn stalks, peanut shells On hydrolysis with sulfuric acid it yields xylose, q v

xylanbassoric acid $C_{19}H_{28}O_{17}$ = 528 22 A hydrolysis-product of bassorin from gum tragacanth, soluble in cold water, hydrolyzed to xylose

xylene C_8H_{10} = 106 12 Dimethylbenzene*, xylol, $C_6H_4Me_2$ **ortho-** or 1 2- A colorless liquid, d 0 881, m −28, b 144 2, insoluble in water, soluble in alcohol or ether **meta-** or 1 3- A colorless liquid, d 0 866, m −54, b 139, insoluble in water, soluble in alcohol or ether **para-** or 1 4- Colorless monoclinic crystals, m 15, b 135, insoluble in water, soluble in alcohol or ether A mixture of all three hydrocarbons ("xylol") is used in microscopy as a solvent

bromo- $Me_2C_6H_3Br$ = 184 99 Cf *xylylbromide* **4-o-** Liquid, d 1 369, m 0, b 214 **2-m-** Liquid, m −10, b 206, **4-m-** b 207 **5-m-** b 204 **2-p-** d 1 356, b 206 **dihydroxy-** Xylenediol **ethyl-** Dimethyl-ethyl*benzene* **hydroxy-** Xylenol **nitro-** See *nitroxylene*

x sulfonic acid $C_8H_{10}O_3S$ = 186 18 (1 2-4)-$C_6H_3Me_2\ SO_3H$ A liquid, b 19

xylenediol $C_8H_{10}O_2$ = 138 1 Xylylene alcohol, xylylol, phenyl-dicarbinol, benzene dicarbinol, $C_6H_4(CH_2OH)_2$ **ortho-** or α,α'-o-, or phthalyl alcohol A solid, m 62 **meta-** or α α'-m-, m 46 **para-** or α α'-p-, or terephthalyl alcohol, m 112 They are used in organic synthesis

xylenol $C_8H_{10}O$ = 122 1 A group of dimethylphenols or hydroxy-dimethylbenzenes, $C_6H_3Me_2OH$ In the following list the first two numbers indicate the position of the two methyl groups, the third number that of the hydroxyl group, the boldface numbers refer to the methyl groups, assuming OH at position 1

1 2 3- or **2 3-**	m 75, b 218
1 2 4- or **3 4-**	m 65, b 225
1 3 2- or **2 6-**	m 49, b 211
1 3 4- or **2 4-**	m 26, b 211
1 3 5- or **3 5-**	m 64,'b 219
1 4 2- or **2 5-**	m 74, b 211

Colorless crystalline powders, soluble in water or alcohol to varying extents

xylenol blue 1,4-Dimethyl-5-hydroxy benzene sulfonphthalein An indicator used in biochemical work, which changes from red (pH = 1 2) to yellow (pH = 2 8), and from yellow (pH = 8 0) to blue (pH = 9 6)

xylic acid $C_9H_{10}O_2$ = 150 13 Methyltoluic acid, dimethylbenzoic acid $Me_2C_6H_3COOH$ Six isomers

2, 3- or α-hemellitic acid	m 144
2, 4-	m 126
2, 5- or p- or *iso*xylic	m 132
2, 6- or v-	m 116
3, 4- or a-	m 165
3, 5- or mesitylinic acid	m 167

xylidene Xylidine

xylidic acid $C_9H_8O_4$ = 180 1 4-Methylisophthalic acid The dibasic acid, $C_6H_3Me(CO-OH)_2$ **1 2 5-** Colorless crystals, m 282 **1 2 4-** Colorless crystals, m 325 (sublimes) **1 2 3-** Colorless crystals, m 144 (decomp) Cf *uvitic acid*

xylidine $C_8H_{11}N$ = 121 1 Xylidene Methyltoluidines, dimethylanilines, aminoxylenes, $C_6H_3Me_2NH_2$ A group of aniline homologs in technical xylidine, used in the synthesis of dyes In the following list, the first two numbers refer to the position of the methyl group, the third to that of the amino radical

1 2 3- Liquid, d 0 991, m −15, b 224
1 2 4- Crystals, d 1 076, m 49, b 225
1 3 2- Liquid, d 0 980, b 216
1 3 4- Liquid, d 0 990, b 212
1 3 5- Liquid, d 0 993, b 220
1 4 3- Liquid, m 15, b 217

They are slightly soluble in water, soluble in alcohol or ether

xylidinic acid Xylidic acid

xylite Xylitol

xylitol $C_5H_{12}O_5$ = 152 1. Xylite The pentahydric alcohols derived from xylose, $CH_2OH-(CHOH)_3CH_2OH$

xylo- A prefix derived from the Greek "wood," and indicating a relation to wood

xylochloral A compound of chloral and xylose, colorless scales, m 132 Used medicinally as a hypnotic

xyloidine $C_6H_9O_6(NO_2)$ = 207 1 An explosive substance obtained by the action of nitric acid on starch or woody fibers

xyloketose $C_5H_{10}O_5$ = 150 1 A pentose-ketose corresponding with xylose and lyxose

xylol A mixture of xylenes, q v

xyloith Wood-stone A mixture of magnesia, magnesium chloride and sawdust which, on moistening, dries to an extremely hard mass, used for floors or laboratory tables

xylon Wood-cellulose

xylonic acid $C_5H_{10}O_6$ = 166 1 A monobasic acid, $CH_2OH(CHOH)_3COOH$, obtained by oxidation of xylose Cf *pentonic acid*

xylonite Celluloid

xylonitrile C_9H_9N = 131 08 Dimethylbenzonitrile $Me_2C_6H_3CN$

xylopal Wood opal

xyloquinone $C_8H_8O_2$ = 136 1 Dimethylquinone $C_6H_2Me_2O_2$, a homolog of quinol **2 3-** A soluble solid, m 55 (sublimes) **2 6-** A soluble solid, m 72 **2 5-** A soluble solid m 61 (sublimes) **3 5-** Phlorone

xylorcinol $C_8H_{10}O_2$ = 138 1 **1 3 4 6-** Dimethylresorcinol, methylorcinol $C_6H_2Me_2(OH)_2$, a homolog of orcinol White crystals, soluble in water, alcohol or ether, m 124, b 278

xylose $C_5H_{10}O_5$ = 150 1 Wood sugar The pentose, $CH_2OH(CHOH)_3CHO$, obtained from xylan, straw or other vegetable fibers by heating with sulfuric acid A colorless crystalline powder, m 140, soluble in water, slightly soluble in alcohol or ether, used in tanning, dyeing and as a diabetic food Cf *xylan, xylonic acid*

xylosic acid $C_5H_8O_6$ = 164 1 The aldehyde-acid, CHO $(CHOH)_3COOH$, derived from xylose

xylostein A poisonous glucoside from the fruit of *Lonicera xylosteum*, a Caprifoliaceae and variety of honeysuckle

xyloyl The monovalent radical, $Me_2C_6H_3CO$—, derived from xylic acid, 7 isomers

xylyl (1) The monovalent radical, $CH_3C_6H_4$-CH_2— derived from xylene It occurs in o-, m-, and p-types (2) Dimethyl-phenyl The monovalent radical, $Me_2C_6H_3$— Cf *tolyl*

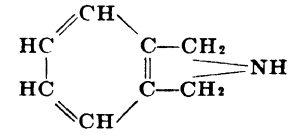
x alcohol (1) Xylenediol (2) Tolyl carbinol.

x. bromides C_8H_9Br = 184 99 MeC_6H_4-CH_2Br Cf bromo*xylene* **o-** A solid, m 21, b 217 7 **m-** A liquid, d 1 371, b 215 **p-** A solid, d 1 324, m 38, b 221 The mixed isomers are a lachrymatory poison gas (T-stoff) **x. chloride** C_8H_9Cl = 140 6 Monochlorxylene, tolylchloride, $CH_3C_6H_4CH_2Cl$ *ortho-* A colorless liquid, b 197, insoluble in water, soluble in alcohol or ether *meta-* A colorless liquid, b 195, insoluble in water, soluble in alcohol or ether *para-* A colorless liquid, b 192, insoluble in water, soluble in alcohol or ether **x. hydrazine** $C_8H_{12}N_2$ = 136 1 $C_6H_3Me_2NH\,NH_2$ Colorless crystalline needles, m 85, soluble in ether

xylylene The divalent radical, $—CH_2C_6H_4$-CH_2—, derived from xylene, in o-, m-, and p-types

x alcohol Xylenediol **x amine** X diamine **x bromide** $C_6H_4(CH_2Br)_2$ **x carbinol** Dimethylphenylethanol, $C_6H_3Me_2$-CH_2CH_2OH **x chloride** X dichloride **x cyanides** $C_{10}H_8N_2$ = 156 13 $C_6H_4(CH_2CN)_2$ *ortho-* m 59 *meta-* m 28, b $_{300mm}$308 *para-* m 98 **x diamines** $C_8H_{12}N_2$ = 136 2 Diaminoxylene $C_6H_4(CH_2NH_2)_2$, and $C_6H_2Me_2$-$(NH_2)_2$ Used in organic synthesis, in the manufacture of dyes **x dichlorides** $C_8H_8Cl_2$ = 175 02 Phthalylchloride $C_6H_4(CH_2Cl)_2$ *ortho-* m 55, b 240 *meta-* m 34, b 252 *para-* m 98, b 245 **x glycol** Xylenediol

xylylenimine C_8H_9N = 119 1 Dihydroisoindole, the heterocyclic compound,



A yellowish liquid, b 213

xylylol Xylenediol

xysmalobin $C_{46}H_{70}O_{20}$ = 952 49 (with $5H_2O$ = 1122 59) A crystalline glucoside from the root of *Xysmalobium undulatum*, wild cotton, milkbush, iShongwe, an Asclepiadaceae of South Africa, used as an emetic by the Zulus

Y

The symbol for yttrium
The second dimension in coordinates, q v
See *upsilon*
See *gamma*

iba bark Andira bark, cabbage tree bark The bark of *Andira excelsa* Cf *andirin, goa*

ibine An alkaloid from yaba bark

icca gum Acaroid resin

ijeine Harmine

ijenine An alkaloid from yaje, an apocynaceous plant of Southern Columbia

im The tubers of *Dioscorea* (q v) species, which contain much starch and are cultivated for food in the tropics, as, **cush-cush-** The y of *D trifida* **negro-** The y of *D cayennensis* **white-** The y of *D alata*

ira-yara β-Naphthyl-methylether

ird yd A unit of length in the English system 1 yard = 3 feet = 36 inches = 0 914402 meter **square-** yd ^{2} or sq yd = 836 13 sq meters **cubic-** yd ^{3} or cu yd = 764 535 cubic centimeters

irn A thread **synthetic-** See *rayon*

irrow The dried leaves and inflorescence of *Achillea millefolium*, a Compositae Used medicinally, as the fluid extract, as a tonic, alterative and astringent

itren Loretin

w root Stillingia

Yb The symbol for ytterbium

yd An abbreviation for yard

year A measure of time, q v , the period of the earth's revolution around the sun

anomalistic y	365 days 6 hours 13 min	48 sec
ordinary y	365 days 5 hours 48 min	46 sec
sidereal y	365 days 6 hours 9 min	9 sec

average civil y 365 2422 mean solar days = $3\ 155693 \times 10^7$ seconds

light- A unit of astronomical distance, the distance which light travels in one year, $5\ 9 \times 10^{12}$ miles or $9\ 4627 \times 10^{12}$ km **solar-** Ordinary y **tropical-** Ordinary y

yeast Cerevisiæ A group of unicellular vegetable organisms or fungi of the family *Saccharomyces* They ferment sugars to carbon dioxide and alcohol by virtue of the enzymes (zymases) they contain They also contain invertase, an enzyme which inverts unfermentable sugars (as cane sugar) to fermentable sugars **baker-, beer-** Compressed y The moist living cells of *Saccharomyces cerevisiæ* compressed with some starchy or other absorbent material Used in baking, brewing, and fermenting, and as a vitamin-rich nutrient **bottom-** Low- **brewer's-** High- and low- **copro-** A yeast that contains a large quantity of coproporphyrin **compressed-** Baker's- **dried-** Y dried at a low temperature, for storage or transport purposes, without greatly impairing its vitality **high-** Top y It rises during fermentation and is used for brewing English beers It is distinguished from low y by the absence of melibiase, an enzyme which ferments raffinose **low-** Bottom y It falls to the bottom of the liquid it is fermenting, used in brewing German beers (Cf *high-*) **pressed-** Baker's- **top-** High- **wild-** A yeast not grown as a pure culture They are responsible for the diseases of beer

y food A mixture of mineral substances (phosphates, etc) added to a fermenting liquid to stimulate the activity of the y **y gum** A mannan formed from a combination of the principal carbohydrates of the y cells with glycogen **y nucleic acid** A nucleic acid from the nucleoprotein of yeast

yeatmanite $(Mn,Zn)_{16}Sb_2Si_4O_{29}$ A triclinic mineral from Franklin, New Jersey

yellow A primary color having a shade between the orange and green of the spectrum **acid-** An amino-azo dye used in dyeing **chrome-** Lead chromate **fast-** An amino-azo dye used in dyeing **indicator-** A pigment of the eye It is yellow in acid and colorless in alkaline solutions, and serves as a light filter **Queen's-** Mercuric subsulfate

y acid *1 3*-Dihydroxynaphthalene-*5 7*-disulfonic acid **y arsenic** Orpiment **y bark** Cinchona **y brass** Muntz metal **y copper** Chalcopyrite **y copperas** Copiapite **y dock** Rumex **y dyes** See *dyes* **y flag** The root of *Iris pseudacorus*, used as astringent **y earth** Ocher **y jasmine** Rumex **y lead ore** Wulfenite **y ore** Chalcopyrite **y parilla** Menispermum **y pigments** See *cadmium yellow, chrome yellow, gamboge, Indian yellow, litharge, orpiment, ocher* **y precipitate** Yellow mercuric oxide **y prussiate of potash** Potassium ferrocyanide **y prussiate of soda** Sodium ferrocyanide **y puccoon** Hydrastis **y resin** Acaroid resin **y root** Xanthorrhiza **y sandalwood** See *sandalwood* **y sanders** Yellow *sandalwood* **y ultramarine** Barium chromate **y wax** (1) A variety of bees-wax (2) A semisolid residue remaining after the distillation of petroleum **y wood** Xanthoxylum

yenite Ilvaite

yenshee Opium dross A poor grade quality of opium, consisting of the dregs and carbonized opium remaining after smoking It may contain from 1 to 10 % morphine Cf *chandoo, mudat*

yerba (1) Spanish for "herb" (2) Maté **y buena** Micromeria The dried leaves of *Micromeria douglassi*, a Labiatae of the Pacific Coast Used medicinally, as the fluid extract, as an aromatic and carminative **y mate** Maté **y reuma** The dried herb of *Frankenia grandifolia*, a Frankeniaceae, used medicinally as a mild astringent **y sagrada** The dried herb of *Lantana brasiliensis*, a Verbenaceae, it is an antipyretic Cf *lantanine* **y santa** Eriodictyon

yerbine An alkaloid from *Ilex paraguayensis*, which resembles caffeine

yew Taxus

yield The proportion of finished material obtained from the raw materials used, the

percentage actually obtained of the amount obtainable theoretically

yield-point The stress at which a marked and permanent increase in the deformation of a substance occurs without an increase in the load

-yl (1) A suffix generally indicating a monovalent hydrocarbon radical, as, methyl, ethyl (2) A suffix indicating the presence of oxygen in a radical, as hydroxyl, uranyl, vanadyl, carbonyl Cf *-ylene*

ylangol $C_{10}H_{18}O$ = 154 20 An isomer of geraniol from ylang-ylang oil

ylang-ylang A tree of the Philippine and Malayan Islands, *Cananga odorata*, an Anonaceae, the flowers are the source of an essential oil **y oil** Cananga oil The essential oil of the flowers of the tree, *Cananga odorata*, d 0 911–0 958, sapon no 90–138 It is used in perfumery, and contains linalool, geraniol and pinene

-ylene A suffix, generally indicating a bivalent hydrocarbon radical, as, methylene, ethylene Cf *-yl, -ylium, -ene*

-yne* A suffix indicating an acetylene linkage Cf *-ine*

yobirine $C_{19}H_{16}N_2$ = 272 14 A decomposition product of yohimbine

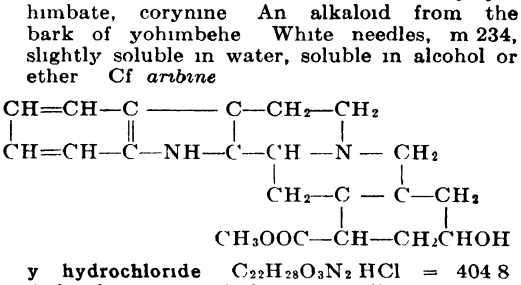
yoghurt Soured milk used as a beverage in Hungary Cf *kefir*

yohimbehe The bark of *Corynanthe johimbe*, a Rubiaceae of the Cameroons, containing several alkaloids, used medicinally as an aphrodisiac

yohimbenine $C_{35}H_{45}O_6N_3$ = 603 6 Corynanthine An alkaloid from the bark and leaves of yohimbehe

yohimbic acid $C_{20}H_{24}N_2O_3$ = 340 15 A monobasic acid derived from yohimbine, its methyl ester

yohimbine $C_{21}H_{26}O_3N_2$ = 352 15 Methyl yohimbate, corynine An alkaloid from the bark of yohimbehe White needles, m 234, slightly soluble in water, soluble in alcohol or ether Cf *aricine*



y hydrochloride $C_{22}H_{28}O_3N_2 \cdot HCl$ = 404 8 Aphrodine A colorless crystalline powder, soluble in water, used medicinally as an aphrodisiac

yolk The yellow part of an egg, which contains nutrient proteins and lecithins

yoloy A steel alloy containing small proportions of P, Ni and Cu

yoshino Tengujo Kodzu A strong thin paper used for making typewriter stencils, made in Japan from the fiber of the paper mulberry (*Broussonetia papyrifera*)

Young, James 1811–1883 An English technical chemist noted for the development of the gas and oil industries **Y, Sydney** 1857–1937 An English chemist, noted for boiling point laws Cf *Ramsay and Young equation*

Young, Thomas 1773–1829 An English physicist, noted for experiments in optics and mechanics **Y's modulus** Longitudinal elasticity An elastic coefficient, or the force (dynes per cm ^{2} or pounds per in ^{2}) that will permanently deform a material by stretching, bending or twisting The stretching modulus M = stress/strain = $mgl/\pi r^2 s$, where s is the elongation produced by a weight, m, in a wire of length, l, and cross section of radius, r

yperite Mustard gas

ysopol $C_{10}H_{18}O$ = 154 20 A terpene-alcohol from hyssop

Yt Symbol for yttrium

ytterbia Ytterbium oxide

ytterbite Gadolinite

ytterbium Yb = 173 04 Neoytterbium, formerly supposed to be a mixture of aldebaranium and cassiopeium A trivalent rare earth metal and element, atomic number 70, discovered by Marignac in 1878 **y acetate** $Yb(C_2H_3O_2)_3 \cdot 4H_2O$ = 422 63 White hexagonal plates, d 2 09, soluble in water **y. bromide** $YbBr_3 \cdot 8H_2O$ = 557 7 A green, hygroscopic crystalline powder, readily soluble in water **y chloride** $YbCl_3 \cdot 6H_2O$ = 388 0 Green rhombic crystals, d 2 575, m 150, soluble in water, alcohol or ether **y oxalate** $Yb_2(C_2O_4)_3 \cdot 10H_2O$ = 791 16 White crystals, d 2 644, insoluble in water **y oxide** Yb_2O_3 = 395 2 Ytterbia A white amorphous powder, d 0 17, insoluble in water, soluble in acids **y oxychloride** YbOCl = 225 1 A white powder, insoluble in water **y sulfate** $Yb_2(SO_4)_3$ = 635 41 A green crystalline powder, d 3 62, decomp 900, soluble in water

Ytterby A small village in Sweden near which many rare earth minerals are found The names *ytterbium*, *terbium*, *yttrium*, and *erbium* are derived from it

yttergranate A calcium-iron garnet, containing small amounts of yttrium compounds

yttria (1) Yttrium oxide (2) Gadolinite **y group** See *rare earth metals*

yttrialite. $Y_2O_3 \cdot 2SiO_2$ A green mineral, also containing iron and thorium

yttrium Y or Yt = 88 92 A trivalent rare-earth metal of the aluminum group and element, atomic number 39, discovered by Gadolin (1794) in gadolinite, which was separated by Mosander (1843) into yttria, terbia and erbia A grayish-black, hexagonal, crystalline powder, d 3 8, which decomposes water and dilute acids, used in the manufacture of incandescent gas mantles **y acetate** $Y(C_2H_3O_2)_3 \cdot 8H_2O$ = 410 1 Colorless crystals, soluble in water **y bromide** YBr_3 = 328 8 A white, deliquescent powder, very soluble in water **y carbonate** $Y_2(CO_3)_3 \cdot 3H_2O$ = 411 8 A pale reddish-white powder, insoluble in water, soluble in dilute acids **y chloride** $YCl_3 \cdot 6H_2O$ = 303 2 Pale red, transparent hygroscopic prisms, d 2 18, m 160, soluble in water or alcohol, insoluble in ether **y hydroxide** $Y(OH)_3$ = 139 7 A white, gelatinous precipitate or amorphous powder, decomp by heat, insoluble in water, soluble in alkalis, acids or ammonium salt solutions **y minerals** The complex ores gadolinite, anerodite, rowlandite, thalenite, xenotime and yttrialite **y nitrate** $Y(NO_3)_3 \cdot 6H_2O$ = 382 8 Colorless or pale-red crystals, d 2 682, soluble in water or alcohol **y oxalate** $Y_2(C_2O_4)_3 \cdot 9H_2O$ = 603 - 98 A white crystalline powder, slightly soluble in water **y oxide** Y_2O_3 = 225 0 Yttria Colorless crystalline powder, d 5 035, insoluble in water and soluble in acids **y sulfate** $Y_2(SO_4)_3 \cdot 8H_2O$ = 610 1 Small, reddish-white crystals, d 2 612, decomp 1000,

slightly soluble in water, soluble in sodium chloride or sulfate solutions **y sulfide** Y_2S_3 = 274 0 A lemon-yellow powder, d 3 91, m 1900–1950, insoluble in water

trocerite A native mixed fluoride of yttrium, cerium, erbium and calcium

trotantalite $Y_4(Ta_2O_7)_3$ A tantalate of the rare earths, with iron and calcium It contains helium

trotitanite A siliceous calcium titanate, which contains oxides of yttrium, aluminum and iron

yucca Adam's needle, Spanish bayonets A Liliaceae, *Y filamentosa*, of Southern California, Texas and Mexico, whose leaves furnish a fiber

Yukawa particle Heavy electron

yukon Heavy electron, a name in honor of Yukawa

yulocrotine $C_{19}H_{25}O_3N$ = 316 21 An alkaloid from *Julocroton Montevidensis*, an Euphorbiaceæ

Z

Z The symbol for (1) atomic number (German Atom Zahl), (2) grm -equivalent weight

z (1) The third dimension of co-ordinates, q v (2) Symbol for the valency of an ion

zaffer Zaffre A mixture or cobalt oxides and arsenates obtained by roasting cobalt ores It is a raw material for the production of cobalt compounds

zaffre Zaffer

zala Borax

zanaloin The aloin from aloes of Zanzibar

zaratite $NiCO_3,2Ni(OH)_2\ 5H_2O$ Emerald nickel A native nickel carbonate

zea (1) A genus of annual grasses to which Indian corn (maize) belongs (2) Corn-silk, the fresh styles and stigmas of *Zea mays*, the maize plant, used medicinally, as the fluid extract as a diuretic

zearin $C_{52}H_{88}O_4$ = 776 8 A colorless principle from various lichens

zeaxanthin $C_{40}H_{56}O_2$ = 568 4 A carotenoid (q v) coloring material from maize, egg yolk and many plants, isomer of xanthophyll and lutein Yellow leaflets, m 101, optically inactive

zebromal $C_{11}H_{12}O_2Br_2$ = 336 0 Ethyldibromcinnamate, ethylphenyldibrompropionate, Ph-CHBr CHBr COOEt A white crystalline powder, insoluble in water, soluble in alcohol or oils, used medicinally as a sedative and hypnotic

zedoary The dried rhizomes of *Curcuma zeodaria*, a Zingiberaceae of the East Indies It contains an essential oil, resin and mucilage and like ginger is used as a stomachic and carminative **z oil** The volatile oil of z , a dark viscid liquid, d 0 990–1 010, b 240–308, containing cineol

Zeeman, P A Dutch physicist noted for his development of the spectrum theory **Z effect** A resolution of spectral lines observed when the source of light, as a flame, is placed in a strong magnetic field, the single lines are divided into three fine lines (a triplet)

zein A prolamine from maize, it contains no tryptophane, cystine or lysine

Zeisel method The determination of methoxy groups by hydriodic acid **Z reaction** The formation of methyl iodide from the reaction of methoxy-compounds with hydroiodic acid

$$(1)\ ROMe + HI = R\,OH + MeI$$
$$(2)\ MeI + AgNO_3 = AgI + MeNO_3$$

The silver iodide is weighed and the MeO-group calculated

zelio paste A rat-poison containing thallium

Zellner's paper Fluorescein paper

Zenker's solution A fixative and preservative for biological specimens 2 5 gm $K_2Cr_2O_7$, 1 gm Na_2SO_4, 5 gm $HgCl_2$, 5 cc acetic acid in 100 cc H_2O

zeolite A group of hydrated aluminum and calcium or sodium silicates capable of reacting in solution, by double decomposition, with salts of the alkali and alkali-earth metals They are of the general type $Na_2O\ 2Al_2O_3\ 5SiO_2$ and $CaO\ 2Al_2O_3\ 5SiO_2$, some are used for water softening Cf *organolite*

analcine	$NaAlSi_2O_6(H_2O)$
chabazite	$CaAl_2Si_4O_{12}(H_2O)_6$
heulandite	$CaAl_2Si_6O_{16}(H_2O)_5$
natrolite	$Na_2Al_2Si_3O_{10}(H_2O)_2$
stilbite	$CaAl_2Si_6O_{16}(H_2O)_6$
thomsonite	$(Ca,Na_2)Al_2Si_2O_8(H_2O)_2$

artificial- Permutite **organic-** A synthetic resin having the properties of a zeolite

zero (1) The complete absence of a particular quantity (2) The point at which a scale has the value of 0, *e g* , the zero of centigrade, the temperature of freezing water **absolute-** See *absolute zero*

zewaphosphate A fertilizer (30 % P_2O_5) obtained by treating sulfite cellulose waste liquor with crude phosphates

zeyherine An alkaloid from the seeds of *Erythrina zeyheri*, a Leguminosae of South Africa

zibet Civet

Ziehl's stain Carbol-fuchsin

Ziervogel process A method of extracting silver by roasting the sulfide to produce silver sulfate, leaching this with water, and precipitating metallic silver with copper

zimphen $C_{10}H_6O_3NNa$ = 211 1 Sodium-m-hydroxycyanocinnamate HO C_6H_4 CH C(C N)-COONa Yellow crystals, soluble in water or alcohol, used medicinally as a tonic and antiseptic

zinc Zn = 65 38 A metal and element, atomic number 30, known to the Hindus and observed by Agricola, but described by Paracelsus in 1520 A bluish-white, brittle metal, d 6 7–7 2, m 419, b 918, insoluble in water, and soluble in acids or hot solutions of alkalis Zinc occurs in nature principally as sulfide, carbonate and silicate It is used as a reducing agent (indigo vats), in alloys, in the metal industry, and in the manufacture of zinc compounds Chemically pure zinc is a reagent for the production of hydrogen (arsenic test) World production (spelter) 1941 1,710,000 long tons, U S A (647,000 tons) > Germany > Canada **activated-** Zinc which has been granulated in the presence of cadmium sulfate for use in the Marsh test (q v) for arsenic **butter of-** Zinc chloride **granulated-** Metallic zinc in the form of distorted granules, prepared by pouring the molten metal into water **powdered-** Finely powdered Zn used as reagent Cf *zinc dust*

z acetate $Zn(C_2H_3O_2)_2\ 3H_2O$ = 237 5 Colorless, monoclinic plates, d 1 72, m 242 soluble in water or alcohol Used as a reagent, as a mordant in dyeing, in the manufacture of glazes for porcelain, and medicinally as an emetic and in gargles and disinfectants *fused-* $Zn(C_2H_3O_2)_2$ = 183 4 A white, fused mass, soluble in water **z albuminate** A compound of albumin and zinc Yellowish scales, slightly soluble in water **z alkyls** A group of organic com-

pounds of the general type, ZnR_2, in which R is an alkyl radical

zinc methide, $ZnMe_2$	(q v)
zinc ethide, $ZnEt_2$	(q v)
zinc propyl, ZnPr	b 146
zinc isopropyl, $Zn(CHMe_2)_2$	b 136
zinc isobutyl, $Zn(CH_2CHMe_2)_2$	b 166
zinc isoamyl, $Zn(CH_2CH_2CHMe_2)_2$	b 210

z alkyl condensation Frankland's reaction A synthesis of hydrocarbons, in which zinc is removed from a zinc alkyl as hydrate or iodide $2R_3CI + ZnMe_2 = 2R_3CMe + ZnI_2$ **z alum** Aluminum zinc sulfate **z amalgam** A mixture of zinc and mercury, used as a reducing agent, or in electric batteries **z ammonium salts** Complex salts of the type $Zn(NH_3)_4Cl_2 \cdot H_2O$, $Zn(NH_3)_5SO_4$ etc analogous to copper-ammonium salts **z arsenate** $ZnHAsO_4$ = 205 4 A white, amorphous powder, slightly soluble in water, soluble in acids Cf *adamite* **z arsenide** Zn_3As_2 = 346 06 **z arsenite** $Zn(AsO_2)_2$ = 279 4 A colorless powder, insoluble in water, soluble in acids **z ashes** The oxidized z removed from the surface of a galvanizing bath **z benzoate** $Zn(C_7H_5O_2)_2$ = 307 46 A white powder, soluble in water **z biborate** Z tetraborate **z bichromate** Z dichromate **z blende** Sphalerite **z bloom** Z oxide **z borate** $ZnB_4O_7 7H_2O$ = 346 7 An amorphous, white powder, used medicinally as a dusting powder and antiseptic **z bromate** $Zn(BrO_3)_2$ = 321 31 A white, hygroscopic powder, m 100, soluble in water, used as an antiseptic **z bromide** $ZnBr_2$ = 225 2 Colorless, hygroscopic needles, d 4 219, m 394, b 690, soluble in water, alcohol or ether Used as a reagent, and medicinally as a sedative and antispasmodic **z butter** Z chloride **z carbonate** $ZnCO_3H_2O$ = 143 40 Tutia A white, rhombic, crystalline powder, d 4 44, decomp 300, insoluble in water, used as an antiseptic in face powders Cf *zinc spar* **z chlorate** $Zn(ClO_3)_2 6H_2O$ = 340 4 Colorless, hygroscopic crystals, m 60, soluble in water or alcohol **z chloride** $ZnCl_2$ = 136 3 Zinc butter A white, deliquescent, octahedral, crystalline powder, d 2 907, m 365, b 730, soluble in water, alcohol or ether Used as a reagent or alkaloids, solvent for cellulose, medicinally as an antiseptic, astringent, and escharotic, as a preservative, in embalming material, as a mordant, and in soldering, as a flux **z chloro-iodide** A mixture of zinc iodide and chloride Used as the saturated solution as a microchemical test for cellulose (blue color) and tannin (violet or red color) **z chloroiodide solution** Naegeli's solution A microchemical test solution prepared by decomposing hydrochloric acid with zinc and saturating the solution with potassium iodide and iodine, cf *Herzberg's stain* **z chromate** $ZnCrO_4 7H_2O$ = 307 6 Zinc yellow, buttercup yellow A yellow powder, soluble in water, used as a pigment **z citrate** $Zn_3(C_6H_5O_7)_2 2H_2O$ = 610 3 A white amorphous powder, slightly soluble in water used medicinally as an antiepileptic **z copper couple** A sheet of zinc coated with a black deposit of copper by immersion in an acid solution of copper sulfate It liberates nascent hydrogen from acid solutions, and will reduce nitrates to ammonia Hence its use in water analysis for the determination of small quantities of nitrates **z cyanide** $Zn(CN)_2$ = 117 4 Colorless orthorhombic prisms, decomp by heat, insoluble in water or alcohol, soluble in cyanide solutions Used as an insecticide, and medicinally as a disinfectant and anthelmintic **z dichromate** $ZnCr_2O_7$ = 281 6 Z bichromate An orange-yellow powder, soluble in water **z diethyl** * Z ethide **z dimethyl** * Z methide **z dithiofuroate** $(C_4H_3OCS_2)_2Zn$ Furac II A brown powder used as accelerator in the vulcanization of rubber **z dust** (1) Finely-divided zinc, used as a reducing agent (2) The flue-dust of smelters, containing zinc, zinc oxide and impurities, used as a gray paint **z ethide** $Zn(C_2H_5)_2$ = 123 5 Zinc ethyl Diethyl zinc * A colorless liquid which ignites on contact with air, d 1 18, m −28, b 118, violently decomp by water Used in organic synthesis **z ethyl** Z ethide **z ethylsulfate** $Zn(C_2H_5SO_4)_2$ = 315 5 Colorless hygroscopic leaflets, soluble in water or alcohol **z ferrocyanide** $Zn_2Fe(CN)_6 3H_2O$ = 396 7 A white powder, insoluble in water or alcohol, soluble in ammonia water Used as an antiseptic **z flowers** Z oxide **z fluoride** ZnF_2 = 103 4 A white powder, slightly soluble in water **z fluosilicate** $ZnSiF_6 6H_2O$ = 315 53 Hexagonal prisms, d 2 104, very soluble in water **z foil** Sheets of zinc prepared by heating the metal to 100–150°C and rolling it **z formate** $Zn(CHO_2)_2$ = 155 4 Colorless crystals, d 2 36, soluble in water, insoluble in alcohol, used medicinally as an antiseptic *dihydrate* $Zn(CHO_2)_2 2H_2O$ = 191 43 Monoclinic white crystals, d 2 205, soluble in water **z glycerophosphate** $Zn(C_3H_7O_2)PO_4$ = 235 44 A white, amorphous powder, soluble in water, insoluble in alcohol or ether, used medicinally **z hydroxide** $Zn(OH)_2$ = 99 4 A white powder or rhombic prisms, d 3 053, decomp by heat, insoluble in water, soluble in acids or alkalis **z hypophosphite** $Zn(H_2PO_2)_2 H_2O$ = 245 4 White, deliquescent crystals, soluble in water Used medicinally as an antiseptic and astringent **z iodate** $Zn(IO_3)_2$ = 415 1 A white, crystalline powder, slightly soluble in water **z iodide** ZnI_2 = 319 2 A colorless powder or octahedral crystals, d 4 696, m 446, b 625, decomp by further heat, soluble in water, alcohol or ether Used as a reagent for detecting chlorine and narceine, and medicinally as an alterant and antiseptic **z iodide-starch paper** A white filter paper, impregnated with a zinc iodide-starch solution Used to detect free chlorine, iodine or ozone (blue color) **z iodide-starch solution** A solution of zinc iodide and soluble starch, used as a test-reagent for oxidizing agents, and as an indicator **z lactate** $Zn(C_3H_5O_3)_2 3H_2O$ = 297 5 A colorless, crystalline powder, slightly soluble in water, used medicinally as an antiepileptic **z malate** $ZnC_4H_4O_5$ = 197 4 A white, crystalline powder, soluble in water **z methide** $Zn(CH_3)_2$ = 95 43 Zinc methyl, dimethyl zinc * A clear, colorless liquid which ignites on contact with air, d $_{10}$°1 39, m −40, b 46, decomp by water or alcohol Used in organic synthesis **z methyl** Z methide **z minerals** Zinc occurs in nature widely diffused as sulfide, carbonate and silicate

sphalerite (regular)	ZnS
wurtzite (hexagonal)	ZnS
zincite	ZnO
gahnite, zinc spinel	$ZnAl_2O_4$
franklinite	$ZnFe_2O_4$

smithsonite, zinc spar	$ZnCO_3$
hydrozincite, zinc bloom	$Zn_3(OH)_4CO_3$
willemite	Zn_2SiO_4
calamine	$Zn_2H_2SiO_5$
goslarite	$ZnSO_4 7H_2O$

z monochloracetate $Zn(C_2H_2ClO_2)_2$ = 252 35 A colorless powder, soluble in water, used medicinally as an antiseptic **z nitrate** $Zn(NO_3)_2 6H_2O$ = 297 50 Colorless, tetragonal crystals, d 2 065, m 36, b 130, soluble in water, alcohol or ether Used as a reagent, medicinally as an escharotic, and as a mordant in dyeing **z nitride** Zn_3N_2 = 224 16 A green powder, readily decomp by water to zinc oxide and ammonia **z oleate** $Zn(C_{18}H_{33}O_2)_2$ = 625 89 A white, greasy, granular powder, insoluble in water, soluble in alcohol, ether or benzene, used in ointments, and as a drier in varnishes **z oxalate** $ZnC_2O_4 2H_2O$ = 189 4 A white powder, d 2 562, slightly soluble in water, soluble in acids or alkalis **z oxide.** ZnO = 81 4 Philosopher's wool A colorless, amorphous powder or hexagonal crystals, d 5 42, insoluble in water, soluble in acids, alkalis or ammonium salt solutions Used as a reagent and neutralizing agent, in the manufacture of rubber goods, glass, pigments, cosmetics, and dusting powders, medicinally as an antiseptic and sedative **z oxide cement** See *dental cement* **z perborate** $Zn(BO_3)_2$ = 183 0 A white, amorphous powder, insoluble in water, used as an oxidizing agent and antiseptic in cosmetics **z perhydrol** Z peroxide **z permanganate** $Zn(MnO_4)_2 6H_2O$ = 411 5 Dark brown, nearly black, deliquescent lustrous crystals, soluble in water Used as an oxidizing agent, astringent and antiseptic **z peroxide** ZnO_2 = 97 4 Zinc perhydrol A yellowish-white, voluminous powder, insoluble in water, decomp by acids Used as a bactericide and antiseptic **z phenate** $Zn(C_6H_5O)_2$ = 251 46 Zinc carbonate A white powder, slightly soluble in water Used medicinally as a dusting powder and antiseptic **z phenolsulfonate** $Zn(C_6H_5SO_4)_2$ = 411 60 Zinc sulfophenate, z sulfocarbolate Colorless prismatic crystals, soluble in water or alcohol, used medicinally as an antiseptic **z phosphate** $Zn_3(PO_4)_2$ = 386 2 A white powder or prisms, d 3 878, m at red-heat, insoluble in water or alcohol, soluble in acids or ammonium salt solutions Used as a reagent, and medicinally, as an antiseptic, tonic and astringent *ortho-* Z phosphate *pyro-* $Zn_2P_2O_7$ = 304 8 A white powder, insoluble in water or alcohol, soluble in acids, alkalis or ammonium salt solutions **z phosphide** Zn_3P_2 = 258 2 A spongy, gray, metallic mass or a dark gray powder, d 4 72, decomp in moist air, insoluble in water or alcohol, decomp by acids Used medicinally as a phosphorus substitute, and as a reagent in making hydrogen phosphide **z phosphite** $ZnHPO_3$ = 145 4 A white, granular powder, soluble in water, used medicinally as a tonic and antiseptic **z picrate** $Zn[C_6H_2O_2(NO_2)_3]_2$ = 489 47 A yellow, crystalline, explosive powder, used medicinally in its hydrated form as an antiseptic **z potassium cyanide** $K_2Zn(CN)_4$ = 247 7 Colorless crystals, soluble in water, used medicinally as a tonic **z potassium iodide** K_2ZnI_4 = 651 1 Colorless crystals, soluble in water, used as a reagent **z potassium sulfate** $K_2Zn(SO_4)_2$ = 335 7 Colorless, hygroscopic crystals, soluble in water **z pyrophosphate** See *z phosphate* **z rhodanide** Z thiocyanate **z salicylate** $Zn(C_6H_4OHCOO)_2 3H_2O$ = 393 5 Colorless needles, soluble in water or alcohol **z silicate** $ZnSiO_3$ = 141 3 A white powder, insoluble in water **z silicofluoride** $ZnSiF_6 6H_2O$ = 315 4 Colorless crystals, soluble in water **z spar** $ZnCO_3$ A native zinc carbonate, and an important zinc ore **z spinel** Gahnite **z stearate** $Zn(C_{18}H_{35}O_2)_2$ = 632 0 A white, granular, greasy powder, insoluble in water Used medicinally as an antiseptic and dusting powder, and as a drier for varnishes and paints **z succinate** $ZnC_4H_4O_4$ = 181 4 A white powder, insoluble in water **z sulfanilate** $Zn(C_6H_4NH_2SO_3)_2 4H_2O$ = 481 5 Nizin A colorless powder, insoluble in water, soluble in alcohol, used medicinally as an astringent and antiseptic **z sulfate** $ZnSO_4$ = 161 45 *anhydrous-* Colorless crystals or a white fused mass, d 3 49, soluble in water *dihydrate-* $ZnSO_4 \cdot 2H_2O$ = 197 48 Fused sticks or white powder, soluble in water *heptahydrate-* $ZnSO_4 7H_2O$ = 287 6, crystalline or common-, zinc vitriol, white vitriol White, rhombic, prismatic, or monoclinic crystals, d 2 015, m 50, soluble in water, alcohol or ether Used as a reagent, for standardizing volumetric solutions, for precipitating proteins, medicinally, as an antiseptic eye-wash, gargle and emetic, as a mordant in dyeing and textile printing, as a preservative for skins and woods, as a weed killer and in the manufacture of paints and varnishes **z sulfide** ZnS = 97 4 Yellowish or grayish-white hexagonal or tetragonal crystals, d 3 98, m 1049, insoluble in water, soluble in acids Used as a pigment and as a reagent in testing the acidity of soils Cf *Sidot's blende* **z sulfite** $ZnSO_3 \cdot 2\frac{1}{2}H_2O$ = 190 49 A white, crystalline powder, slightly soluble in water, soluble in ammonium salts solutions, used as a preservative for anatomical specimens, and as an antiseptic **z sulfocarbolate** Z phenolsulfonate **z sulfocyanate** Z thiocyanate **z sulfhydrate** $Zn(SH)_2$ = 131 4 A white powder, insoluble in water, decomp when dry (so it is kept under water), used as an intestinal antiseptic **z tartrate** $ZnC_4H_4O_6$ = 213 5 A white powder, slightly soluble in water **z tetraborate** ZnB_4O_7 = 220 7 Zinc borate, z biborate A white powder, insoluble in water, soluble in acids, used as an antiseptic **z thiocyanate** $Zn(CNS)_2$ = 181 5 Z rhodanate Z sulfocyanate White deliquescent crystals, soluble in water **z valerate** $Zn(C_5H_9O_2)_2 2H_2O$ = 303 5 A white crystalline powder, soluble in water or alcohol, used medicinally as an antispasmodic and astringent **z vitriol** Z sulfate **z white** (1) Z oxide (2) A mixture of 80 % ZnO and 20 % $BaSO_4$ (German usage) **z yellow** Z chromate

zincamide $Zn(NH_2)_2$ = 97 43

zincate A salt of amphoteric zinc hydroxide, of the type, M_2ZnO_2 They form various hydrated ions, in solution, as, $Zn(OH)_2^{--}$, $Zn(OH)_3^{-}$

zincic acid The amphoteric form of zinc hydroxide $H_2ZnO_2 \rightleftarrows Zn(OH)_2$

zincite A rare red, native zinc oxide, ZnO, hardness 4–4 4, d 5 4–5 7

zincography Process engraving The reproduction of pictures, graphs, etc on zinc plates, the surface of which is first coated with special wax, on which is drawn or photographed the

picture to be printed A strong acid dissolves the zinc not covered by the drawing etc , which is thus left in relief like a printer's type

zinethyl Zinc ethide

zingerone $C_{11}H_{14}O_3$ = 194 1 *4*-Hydroxy-*3*-methoxyphenylethyl (methyl) ketone, $MeCOCH_2CH_2C_6H_3(OH)OMe$ A ketone with a pungent taste, in ginger Colorless crystals, m 41, b $_{14mm}$188 slightly soluble in water Cf *capsicin*

zingiber Ginger

Zingiberaceae See *Scitaminaceae*

zingiberene $C_{15}H_{24}$ = 204 19 *1*-Methyl-*4*-propenylcyclohexane A sesquiterpene from oil of ginger, d 0 872, b 279

zingiberol $C_{15}H_{26}O$ = 222 2 An alcohol, b-$_{14mm}$157, from ginger

zinin Azoxybenzene

zinkenite $PbSb_2S_3$ A native lead sulfo-antimonite

zinkite Zincite

zinnkies Cu_2FeSnS_4 A native copper and iron sulfostannate

zinnwaldite $(K, Li)_3FeAl_3Si_6O_{16}F_2$ A pale violet, yellow or brown lithia-mica

zippeite A native uranium sulfate, which contains less than 5 % of copper oxide

zircon $ZrSiO_4$ Ostranite Jargon A native zirconium silicate Fairly transparent, yellow crystals, d 4 68–4 70, hardness 7 5, used as a source of Zr compounds The transparent orange-colored variety is a gem (hyacinth, jargon) See *starlite, malacon, oerstedite,* z **alba** Zirconium oxide

zirconate A salt of amphoteric zirconium hydroxide of the type, M_2ZrO_3

zirconia Zirconium oxide

zirconic acid Zirconium hydroxide z **anhydride** Zirconium oxide

zirconium Zr = 91 22 A rare earth-metal and element of the carbon-group, atomic number 40, discovered by Klaproth in 1789 A silver-white, crystalline or gray amorphous metal, d 4 15 (cryst) 6 53 (amorphous), m 2130, insoluble in water or acids, soluble in hydrofluoric acid, aqua regia or molten alkalis It has a valency of four and forms 3 series of compounds normal, Zr^{++++}, basic ZnO^{++} (zirconyl), and ZrO_3^{--} (zirconates) Used in steel manufacture as a deoxidizer, denitrifier and desulfurizer, in the form of silicon-zirconium or ferrosilicon zirconium, in many alloys for wires and filaments, as a "getter" in radio tubes, as an x-ray filter, with 40 % Mg as flash powder, coated on aluminum foil for flash bulbs, and for making Cs from $Cs_2Cr_2O_7$ World production in 1941, 14,000 short tons, U S > India > Brazil > Madagascar z **bromide** $ZrBr_4$ = 411 0 Z tetrabromide A white powder, decomp violently by water to form zirconyl bromide z **carbonate** Zirconyl carbonate z **chloride** $ZrCl_4$ = 232 8 Z tetrachloride Colorless lustrous crystals, subliming 350, decomp by water to zirconyl chloride, used in organic synthesis (Friedel-Craft reaction) z **dioxide** Zirconium oxide z **fluoride** ZrF_4 = 167 2 Colorless crystals d 4 433, m at red heat, insoluble in water z **hydroxide** $Zr(OH)_4$ = 159 2 A colorless, amorphous powder, insoluble in water, soluble in acids with the formation of Zr^{++++} and ZnO^{++} ions, and in alkalis with formation of ZrO_3^{--} ions z **iodide** ZrI_4 = 599 1 Very hygroscopic, brownish-red crystals soluble in water z **nitrate** Zirconyl nitrate z **oxide** ZrO_2 = 123 2 Zirconia, zircon alba, z anhydride, z dioxide, native as baddeleyite, zirkite and becarite It occurs in three crystalline forms as a heavy, white powder, m 2730, insoluble in water or acids, soluble in hot sulfuric acid or hydrofluoric acid It is a durable refractory and an effective opacifier of fused enamels, glass, and glazes, also used in the manufacture of Welsbach mantles, with silica and graphite for safe and vault walls, and medicinally in x-ray photography as a substitute for bismuth salts z **oxybromide** Zirconyl bromide z **oxychloride** Zirconyl chloride z **silicate** See *zircon, auerbachite* and *azorite* z **sulfate** $Zr(SO_4)_2\,4H_2O$ = 355 4 A colorless, crystalline powder, soluble in water, used as a reagent for potassium z **tetrachloride** Z chloride

zirconyl The divalent ZrO= radical z **bromide** $ZrOBr_2$ = 267 1 Zirconium oxybromide A colorless, very deliquescent powder decomp in moist air z **carbonate** $ZrOCO_3$ = 167 22 An amorphous white powder, insoluble in water, soluble in acids z **chloride** $ZrOCl_2$ = 178 14 Zirconium oxychloride, basic zirconium chloride Colorless, long, silky needles, soluble in water or alcohol z **hydroxide** $ZrO(OH)_2$ = 141 24 A white amorphous powder, insoluble in water soluble in alkalis or acids z **nitrate** $ZrO(NO_3)_2$ = 231 24 A white, crystalline powder, soluble in water or alcohol, used in the manufacture of Welsbach mantles z **phosphate** $(ZrO)_3(PO_4)_2\,8H_2O$ = 655 70 A colorless, dense, amorphous powder, insoluble in water

zirkite ZrO_2 A native zirconia ore from Brazil, used as fire-brick cement and opacifier

zirlite $Al(OH)_3$ A light-yellow, native, aluminum hydroxide

Zn The symbol for zinc

zoetrope An early name for the cinematograph

zoisite $Ca_2Al_3(OH)(SiO_4)_3$ Thulite A native, calcium, aluminum orthosilicate, which gives its name to a group of silica minerals, q v

Zöller, Philipp 1833–1885 A German chemist, noted for agricultural and biochemical work

zone Any area or space of interest, especially a region of oriented molecules Cf *orientation* It differs from a phase (which is homogeneous with molecules in random directions) since it is heterogeneous with molecules oriented Many colloidal phenomena and processes are thereby explained, as, adsorption (wetting and flotation), protective colloid action, gel formation, thixotropy, the passivity of metals **interfacial-** The layer of oriented A and B molecules between two phases A and B **micellar-** A region of oriented molecules, either isolated or continuous, in a surrounding phase (which may be absent, as, in an elastic gel) **monomolecular-** A layer of oriented C molecules between two phases A and B **polar-** A z which consists of oriented dipoles, as in solvates, q v

zoo- A prefix derived from the Greek, indicating a relation to "animals"

zoochemistry A branch of biological chemistry dealing with the composition of and reactions occurring in animal organisms

zoogloea, zoogloea A firm gelatinous mass, consisting of bacteria embedded in a jelly-like matrix

zoology A branch of biological science that deals with the classification, structure and function of animals

zoomaric acid $C_{16}H_{28}O_2$ = 240 22 Hexadecenoic acid The monobasic acid $Me(CH_2)_6CH$ - $CH(CH_2)_6COOH$, from marine animal oils such as cod-liver and whale oils It is probably identical with palmitoleic acid

zoospore A mobile spore, or swarm spore, produced by many fungi

zoosterol A sterol (q v) of animal origin, *e g* , cholesterol

zootoxin A poison derived from an animal, as, bufotalin, venoms

Zosimos of Panopolis Middle 5th century B C A Greek writer of Egypt, who wrote 20 chemical works, and show that the term "chemistry" is not of Arabic origin ($\pi\epsilon\rho\grave{\iota}\ \tau\eta\varsigma\ \chi\eta\mu\epsilon\iota\alpha\varsigma$ = On Chemistry)

Zr The symbol for zirconium

Zsigmondy, Richard 1865–1929 An Austrian chemist, noted for his research on colloids **Z filter** A series of graded ultra-filters for separating ultramicroscopical particles or colloids from solutions, according to their sizes They consist of semi-permeable membranes of varied compositions and degrees of permeability, used in analytical and physiological chemistry

zuckerin Saccharin

zwitter-ion A complex ion that is both positively and negatively charged, as, $R\begin{cases} X^- \\ Y^+ \end{cases}$ *e g* , ^+NH - $R\,SO_3^-$ or $^+NH_3\,R\,COO^-$ Cf *amphoteric*

zygadenine $C_{39}H_{63}O_{10}N$ = 705 5 An alkaloid from the bulbs of *Zygadenus nuttalli*, a Liliaceae of the Rocky Mountains It resembles veratrine

zygograph (Greek, "zygon," a "yoke ") A diagram showing the relationship between the composition of a vapour and that of a liquid in equilibrium with it, used in distillation problems

zygote A fertilized cell See *gamete*

zyklon Hydrocyanic acid absorbed in fuller's earth, used in fumigation

zylonite Celluloid

zymase An enzyme of yeast that splits sugar into alcohol and carbon dioxide It can be separated from the yeast cell and still retain its activity Cf *invertase*

zyme A ferment, especially a disease-producing ferment or virus

zymin An acetone-dried yeast

zymochemistry The chemistry of fermentation

zymo-excitor A kinase, or substance that converts a zymogen into an active enzyme

zymogen The mother-substance of an enzyme, a substance secreted from tissues or glands that is split into an active enzyme and protein by the action of a kinase or zymo-excitor

zymohexose A monosaccharide that ferments readily, as, d-glucose, d-fructose, d-mannose

zymohydrolysis Zymolysis

zymology A branch of science that deals with the action and composition of ferments or enzymes

zymolysis Zymohydrolysis A hydrolytic or other chemical reaction produced by an enzyme

zymoplasm Thrombase

zymosis Fermentation, or reactions caused by enzymes

zymosterol $C_{27}H_{44}O$ = 384 3 A sterol (q v) from yeast, m 108, $[\alpha]_D$ +17 3°, insoluble in water

zymurgy A branch of chemistry that deals with the application of enzymes in brewing, distilling or wine-making In its broader meaning it includes the processes of fermentation for manufacturing purposes, as in the tobacco, cheese, indigo or leather industry