Hawley's

Condensed Chemical

Dictionary

THIRTEENTH EDITION

Revised by

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JOHN WILEY & SONS, INC.
New York • Chichester • Weinheim • Brisbane • Singapore • Toronto

This text is printed on acid-free paper. ♾

Library of Congress Cataloging-in-Publication Data

Condensed chemical dictionary.
Hawley's condensed chemical dictionary.—13th ed./revised by Richard J. Lewis, Sr.
p. cm.
ISBN 0-471-29205-2 (hardcover)
1. Chemistry-Dictionaries. I. Hawley, Gessner Goodrich, 1905–1983.
II. Lewis, Richard J., Sr. III. Title.
QD5.C5 1997
540'.3—dc21 97-35762
CIP

Printed in the United States of America

10 9 8 7 6

amorphous wax. See microcrystalline wax.

amosite. A type of asbestos.
See asbestos.

AMP. (1) Abbreviation for 2-amino-2-methyl-1-propanol. (2) Abbreviation for adenosine monophosphate.
See adenylic acid.

A5MP. Abbreviation for adenosine-5-monophosphoric acid.
See 5′-adenylic acid.

"AMP-95" ***[Angus]***. TM for 2-amino-methyl-1-propanol.
Grade: 95% and 99+%.
Available forms: Liquid.
Use: Multifunctional amine, used as codispersant, solubilizer, stabilizer, neutralizer, buffer, and catalyst.

"Ampco" ***[Ampco]***. TM for a series of aluminum-iron-copper alloys containing 6–15% aluminum, 1.5–5.25% iron, balance copper. Resistant to fatigue, corrosion, erosion, wear, and cavitation pitting.
Use: For bushings, bearings, gears, slides, etc.

"Ampcoloy" ***[Ampco]***. TM for a series of industrial copper alloys including low-iron-aluminum bronzes, nickel-aluminum bronzes, tin bronzes, manganese bronzes, lead bronzes, beryllium-copper, and high-conductivity alloys.

"Ampco-Trode" ***[Ampco]***. TM for a series of aluminum-bronze arc-welding electrodes and filler rod containing 9.0–15.0% aluminum, 1.0–5.0% iron, balance copper, for joining like or dissimilar metals and overlaying surfaces resistant to wear, corrosion, erosion, and cavitation-pitting.

AMPD. Abbreviation for 2-amino-2-methyl-1,3-propanediol.

amphetamine. (1-phenyl-2-aminopropane; methylphenethylamine; "Benzedrine"). $C_6H_5CH_2CH(NH_2)CH_3$.
Properties: Colorless, volatile liquid; characteristic strong odor; slightly burning taste. Bp 200–203C (decomposes), flash p 80F (26.6C). Soluble in alcohol and ether; slightly soluble in water.
Grade: Dextro-, dextrolevo-. Also available as phosphate and sulfate.
Hazard: Flammable, moderate fire risk. Basis of a group of hallucinogenic (habit-forming) drugs that affect the central nervous system. Sale and use restricted to physicians. Production limited by law.
Use: Medicine.

amphibole. A type of asbestos.
See asbestos.

amphipathy. The simultaneous attraction and repulsion in a single molecule or ion consisting of one or more groups having an affinity for the phase in which they are dissolved together with groups that tend to be expelled by the medium.

amphiphilic. Molecule having a water-soluble polar head (hydrophilic) and a water-insoluble organic tail (hydrophobic), e.g., octyl alcohol, sodium stearate. Such molecules are necessary for emulsion formation and for controlling the structure of liquid crystals.
See emulsion; liquid crystal.

ampholyte. A substance that can ionize to form either anions or cations and thus may act as either an acid or a base. An ampholytic detergent is cationic in acid media and anionic in base media. Water is an ampholyte.
See amphoteric.

amphora catalyst. See catalyst, amphora.

"Amphosol" ***[Stepan]***. (cocamidopropyl betaine)
TM for chemical used in shampoos, liquid hand soap, bubble bath, thickeners, and foam enhancers.

amphoteric. Having the capacity of behaving either as an acid or a base. Thus, aluminum hydroxide neutralizes acids with the formation of aluminum salts, $Al(OH)_3 + 3HCl \rightarrow AlCl_3 + 3H_2O$, and also dissolves in strongly basic solutions to form aluminates, $Al(OH)_3 + 3NaOH \rightarrow Na_3AlO_3 + 3H_2O$. Amino acids and proteins are amphoteric, i.e., their molecules contain both an acid group (COOH) and a basic group (NH_2). Thus, wool can absorb both acidic and basic dyes.

amphotericin B. A polyene antifungal antibotic. $C_{47}H_{73}NO_{17}$.
Properties: Pale yellow, semicrystalline powder. Mp >170C (gradual decomposition). Insoluble in water; slightly soluble in methanol; somewhat more soluble in dimethylsulfoxide.
Derivation: Fermentation with *Sterptomyces nodosus*. Commercially available as a deoxycholate complex.
Grade: USP.
Hazard: May have undesirable side effects.
Use: Medicine (meningitis treatment).

ampicillin (USAN). (6,D,α-aminophenyl-acetamido penicillanic acid). $C_{16}H_{19}N_3O_4S$.
A semisynthetic antibiotic, active against some Gram-negative infections.

amprolium. (1-[(4-amino-2-propyl-5-pyrimidinyl)-methyl]-2-picolinium chloride). $C_{14}H_{19}ClN_4$.
A cocidiostat used in veterinary medicine.

Available forms: Piezoelectric crystals.
Use: Element in high fidelity stereo units and as a transducer for ultrasonic cleaners, ferroelectric materials in computer memory units.

leaf, filter. A unit of a shell-and-leaf filter press on which the cake is formed. In general, a leaf consists of a circular or rectangular metal frame in which is fastened a coarse wire screen. This is covered on both sides with a fine-mesh wire cloth, over which is placed the filter medium proper, e.g., nylon fabric. The filtrate passes through the fabric and into an escape pipe to the discharge port. Each shell may contain as few as six or as many as 50 leaves of varying dimensions; the entire assembly can be pulled out of the shell for cake removal. In some models the leaves rotate.

"Leafseal" *[Humphrey].* TM for a formulation of decenylsuccinic acid and its esters.
Use: Direct application to plants to enable them to resist frost and drought.

leather. An animal skin or hide that has been permanently combined with a tanning agent that causes a physicochemical change in the protein components of the skin. This change renders it resistant to putrefactive bacteria, enzymes, and hot water, increases its strength and abrasion resistance, and makes it serviceable for long periods of time. Tanning agents are either vegetable, mineral, or synthetic. Hides from cows or steers are chiefly used for men's shoes, transmission belting, and other heavy-duty service. These are usually vegetable-tanned. Lighter grades made from the skins of sheep, calves, or reptiles are used for shoe uppers, luggage, gloves, and similar end products (chrome-tanned).

Leather is a naturally poromeric material that retains the microporosity of the original skin; this property makes it uniquely applicable to footwear; to a limited extent it is able to conform to the contour of the individual foot. Leather is made in many colors, weights, and finishes. However, it has been replaced to an increasing extent by plastics for many minor uses, and by synthetics for shoe uppers and soling. For further information refer to American Leather Chemists' Association, University of Cincinnati, Cincinnati, Ohio 45220.

See poromeric; tanning.

leavening agent. See yeast; baking powder.

Lebedev process. Formation of butadiene from ethanol by catalytic pyrolysis. The catalysts used are mixtures of silicates and aluminum and zinc oxides.

Le Blanc. (1742–1806). A French inventor of the first successful process for making soda ash. His patent was confiscated by the Revolutionist government, and the process was used widely for years without either acknowledgment or remuneration. His original formula was 100 parts salt cake, 100 parts limestone, and 50 parts coal.

Lechanche cell. See dry cell.

Le Chatelier. (1850–1936). A French physical chemist, famous chiefly for his statement of the equilibrium principle (often known as Le Chatelier's law). His work included investigations of cements, alloys, and gaseous combustion. The principle may be stated: every system in equilibrium is conservative and tends to resist changes upon it by reacting in such a way as to help nullify the imposed change.

lecithin. $C_8H_{17}O_5NRR'$, R and R′ being fatty acid groups. Pure lecithin is a phosphatidyl choline. The lecithins are mixtures of diglycerides of fatty acids linked to the choline ester of phosphoric acid. The lecithins are classed as phosphoglycerides or phosphatides (phospholipids). Commercial lecithin is a mixture of acetone-insoluble phosphatides. FCC specifies not less than 50% acetone-insoluble matter (phosphatides).
Properties: Light-brown to brown, viscous semiliquid, characteristic odor. Partly soluble in water and acetone; soluble in chloroform and benzene.
Derivation: Usually from soybean oil, also from corn, other vegetable seeds, egg yolk, and other animal sources.
Grade: Technical, unbleached, bleached; fluid, plastic, edible, FCC, 96+% for biochemical or chromatographic standards.
Use: Emulsifying, dispersing, wetting, penetrating agent, and antioxidant; in margarine, mayonnaise, chocolate and candies, baked goods, animal feeds, paints, petroleum industry (drilling, leaded gasoline), printing inks, soaps and cosmetics, mold release for plastics, blending agent in oils and resins, rubber processing, lubricant for textile fibers.

lectin. A type of protein occurring in the seeds of certain plants, especially legumes, characterized by unusual binding specificity; their precise function in the plant is being researched. Studies have been made on the molecular structure and carbohydrate content of the lectin found in the European herb sainfoin.

Leduc's rule. States that the volume occupied by a gas mixture is equal to the sum of the volumes occupied separately by each constituent at the same temperature and pressure as the mixture.

LEED. Low-energy electron diffraction.

lees. The sediment at bottom of wine storage tank.

Leeuwenhoek, van. See van Leeuwenhoek, Anton.

"Phos-chek P-30 and P-40" ***[Monsanto].*** TM for ammonium polyphosphate.
Grade: Regular and fine white powder.
Use: Phosphorus-based catalyst in organic and latex-based fire-retardant intumescent paints, mastics, and polymers.

"Phosdrin" ***[Shell].*** TM for a mixture containing more than 60% of the α isomer of 2-$(CH_3O)_2P(O)OC(CH_3)$:$CHCOOCH_3$ (generic name mevinphos) and less than 40% of insecticidally active related compounds. It is 100% active.
See mevinphos.

"Phosflake" ***[PPG].*** TM for a uniform blend of caustic soda and trisodium phosphate prepared in flake form, especially for bottle-washing use.

phosgene. (carbonyl chloride; carbon oxychloride; chloroformyl chloride).
CAS: 75-44-5. $COCl_2$.
Properties: Liquid or easily liquefied gas, colorless to light yellow; odor varies from strong and stifling when concentrated to haylike in dilute form. D 1.392 (19/4C), fp −128C, bp 8.2C, sp vol 3.9 cu ft/lb (21.1C). Slightly soluble in water and slowly hydrolyzed by it; soluble in benzene and toluene. Noncombustible.
Derivation: By passing a mixture of carbon monoxide and chlorine over activated carbon.
Hazard: Very toxic via inhalation, strong irritant to eyes. TLV: 0.1 ppm in air.
Use: Organic synthesis, especially of isocyanates, polyurethane and polycarbonate resins, carbamates, organic carbonates, and chloroformates; pesticides; herbicides; dye manufacture.

phosmet.
CAS: 732-11-6. $C_{11}H_{12}NO_4PS_2$. A dimethyl ester of phosphorodithioic acid.
Properties: Colorless crystals. Mp 72C. Partially soluble in water; decomposes on heating.
Hazard: Toxic by ingestion, may inhibit cholinesterase.
Use: Acaricide, insecticide.

phosphamidon. (2-chloro-2-diethylcarbamoyl-1-methylvinyl dimethyl phosphate).
CAS: 13171-21-6.
$(CH_3O)_2P(O)OC(CH_3)$:$C(Cl)C(O)N(C_2H_5)_2$.
Properties: Colorless liquid. Bp 162C (1.5 mm Hg). Soluble in water and organic solvents.
Hazard: Toxic by ingestion, inhalation, skin absorption; cholinesterase inhibitor; use may be restricted.
Use: Insecticide.

phosphatase, alkaline. An enzyme excreted into the bile by the liver and found in the blood. It is concerned with bone formation, probably being produced by osteoblasts. It hydrolyzes phosphoric acid esters at pH 7–8, liberating phosphate ions.
Use: Biochemical research.

phosphate, condensed. A phosphorus compound with two or more phorphorus atoms in the molecule. Examples are polyphosphates, pyrophosphates.
See polyphosphoric acid.

phosphate glass. A type of glass containing phosphorus pentoxide. Aluminum-metaphosphate is frequently the basic material. Such glasses have properties not attainable in silicate glasses, e.g., resistance to hydrogen fluoride.

phosphate rock. (phosphorite). A natural rock consisting largely of calcium phosphate and used as a raw material for manufacture of phosphate fertilizers, phosphoric acid, phosphorus, and animal feeds. Recovery of uranium from the manufacture of phosphoric acid and other phosphate chemicals is expected to become an important source of this metal. Phosphate rock is the primary source of superphosphate, prepared by treatment of the pulverized rock with sulfuric acid (superphosphate having 16–18% P_2O_5) or by acidifying with phosphoric acid (triple superphosphate having 40–48% P_2O_5). Nitric acid is sometimes used, i.e., nitrophosphate. Defluorinated phosphate rock is the source of phosphate used in animal feeds and feed concentrations. Important deposits are in the U.S. (Florida, North Carolina, Tennessee, California, Wyoming, Montana, Utah, Idaho), North Africa (Morocco, Libya, Algeria), the former U.S.S.R., and various islands in the Pacific.

phosphate slag. Glassy calcium silicate, by-product of electric furnace phosphorus manufacture.
Properties: Lumps, loose bulk d 85 lb/ft^3.

phosphatide. See phospholipid.

phosphatidyl choline. See lecithin.

phosphatidyl ethanolamine. See cephalin.

phosphatidyl serine. See cephalin.

phosphazene. (phosphonitrile). A ring or chain polymer that contains alternating phosphorus and nitrogen atoms with two substituents on each phosphorus atom. Characteristic structures are cyclic trimers, cyclic tetramers, and high polymers. The substituent can be any of a wide variety of organic groups, halogen, amino, etc. Most cyclic trimers are crystalline, solids, organosoluble, and stable to weather conditions; the high polymers (polyphosphazenes) are elastomeric or thermoplastic. A copolymer of phosphazene and styrene has been investigated for use as a flame-retardant.

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