Hawley's

Condensed Chemical

Dictionary

THIRTEENTH EDITION

Revised by

Richard J. Lewis, Sr.

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.

surface, but it also includes dispersions involving only one phase of matter, i.e., solid-solid or liquid-liquid.
See interface; surface area; surface chemistry.

surface-active agent. (surfactant). Any compound that reduces surface tension when dissolved in water or water solutions, or that reduces interfacial tension between two liquids, or between a liquid and a solid. There are three categories of surface-active agents: detergents, wetting agents, and emulsifiers; all use the same basic chemical mechanism and differ chiefly in the nature of the surfaces involved.
See interface; surface chemistry.

surface area. The total area of exposed surface of a finely divided solid (powder, fiber, etc.) including irregularities of all types. Since activity is greatest at the surface, that is, the boundary between the particle and its environment, the larger the surface area of a given substance, the more reactive it is. Thus reduction to small particles is a means of increasing the efficiency of both chemical and physical reactions; for example, the coloring effect of pigments is increased by maximum size reduction. Carbon black is notable among solids for its huge surface area (as much as 18 acres/lb for some types); the activity of its surface accounts for its outstanding ability to increase the strength and abrasion resistance of rubber. The capacity of activated carbon to adsorb molecules of gases is due to this factor. Surface area is measured most accurately by nitrogen adsorption techniques.

surface chemistry. The observation and measurement of forces acting at the surfaces of gases, liquids and solids or at the interfaces between them. This includes the surface tension of liquids (vapor pressure, solubility); emulsions (liquid-liquid interfaces); finely divided solid particles (adsorption, catalysis); permeable membranes and microporous materials; and biochemical phenomena such as osmosis, cell function, and metabolic mechanisms in plants and animals. Surface chemistry has many industrial applications, a few of which are air pollution, soaps and synthetic detergents, reinforcement of rubber and plastics, behavior of catalysts, color and optical properties of paints, aerosol sprays of all types, monolayers and thin films, both metallic and organic. Outstanding names in the development of this science are Graham, Freundlich, and W. Ostwald in the 19th Century, and Harkins, Langmuir, LaMer, and McBain in the 20th.
See colloid chemistry.

surface tension. In any liquid, the attractive force exerted by the molecules below the surface upon those at the surface-air interface, resulting from the high molecular concentration of a liquid compared to the low molecular concentration of a gas. An inward pull, or internal pressure, is thus created which tends to restrain the liquid from flowing. Its strength varies with the chemical nature of the liquid. Polar liquids have high surface tension (water = 73 dynes/cm at 20C); nonpolar liquids have much lower values (benzene = 29 dynes/cm, ethanol = 22.3 dynes/cm), thus they flow more readily than water. Mercury, with the highest surface tension of any liquid (480 dynes/cm) does not flow, but disintegrates into droplets.
See interface; surface-active agent.

surfactant. See surface-active agent.

"Sur-Gard" ***[Nalco].*** TM for chemicals used for treatment of boiler water to inhibit scale and corrosion and to remove oxygen from the boiler water.

"Surlyn" ***[Du Pont].*** TM for a group of ionomer resins.
Properties: ("Surlyn" A) Thermoplastic produced as a granular material; flexible, transparent, grease resistant; very light weight but tough. Izod impact strength 5.7–14.6 ft-lb/in (higher than any other polyolefin), tensile strength 3,500–5,500 psi, elongation 300–400%, softening point 71. Insoluble in any commercial solvent. Subject to slow swelling by hydrocarbons, to slow attack by acids.
Use: Coatings, packaging films, products made by injection or blow molding, or by thermoforming.

SUS. Abbreviation for Saybolt Universal Seconds.
See Saybolt Universal viscosity.

suspension. A system in which very small particles (solid, semisolid, or liquid) are more or less uniformly dispersed in a liquid or gaseous medium. If the particles are small enough to pass through filter membranes, the system is a colloidal suspension (or solution). Examples of solid-in-liquid suspensions are comminuted wood pulp in water, which becomes paper on filtration; the fat particles in milk; and the red corpuscles in blood. A liquid-in-gas suspension is represented by fog or by an aerosol spray. If the particles are larger than colloidal dimensions they will tend to precipitate if heavier than the suspending medium, or to agglomerate and rise to the surface if lighter. This can be prevented by incorporation of protective colloids. Polymerization is often carried out in suspension, the product being in the form of spheres or beads.
See solution; colloidal; dispersion; emulsion; colloid chemistry.

"Sustane" ***[UOP].*** TM for synthetic, food-grade antioxidant product line including BHA, BHT, TBHQ, propyl gallate, and liquid blends.
Use: To preserve vegetable oils, animal fats, spices, baked goods, nuts, pet foods, dressing oils, confections, cereals, sausage, cosmetics, and dehydrated potatoes.