Hawley's

Condensed Chemical

Dictionary

TWELFTH EDITION

Revised by

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Btu. (British thermal unit). The quantity of heat required to raise the temperature of one pound of water one degree Fahrenheit (usually from 39 to 40F). This is the accepted unit for the comparison of heating values of fuels. For example, fuel gases range from 100 (low producer gas) to 3200 (pure butane) Btu/cu ft. The usual standard for a city gas is approximately 500 Btu/cu ft.

BTX. Commercial abbreviation for benzene, toluene, xylene, the three major aromatic compounds.

Bu. Informal abbreviation for butyl.

bubble cap column. See tower, distillation.

bubbler cap plate. A part of distillation equipment for obtaining efficient contact between gases and liquids. The liquid flows over the surface of a perforated plate while the gas flows through the perforations.

Bucherer-Bergs reaction. Preparation of hydantoin from carbonyl compound by reaction with potassium cyanide and ammonium carbonate, or from the corresponding cyanohydrin and ammonium carbonate.

Bucherer reaction. A procedure for preparation of β-naphthylamine by heating β-naphthol with a water solution of ammonium sulfite. "A sulfite solution is prepared by saturating concentrated ammonia solution with sulfur dioxide and adding an equal volume of concentrated ammonia solution, β-naphthol is added and the charge is heated in an autoclave provided with a stirrer or a shaking mechanism" (L.F. Fieser). This reaction is also involved in the preparation of several azo dye intermediates, e.g., Tobias acid.

Bucherer carbazole synthesis. Formation of carbazoles from naphthols or naphthylamines, arylhydrazines, and sodium bisulfite.

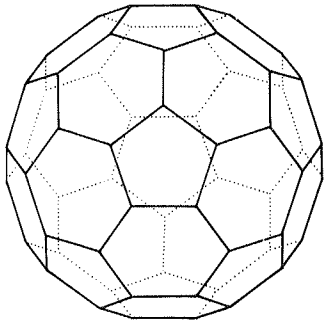
Buchner-Curtius-Schlotterbeck reaction. Formation of keto compounds from aldehydes and aliphatic diazo compounds; ethylene oxides may also be formed.

Buchner, Eduard. (1860–1917). A German chemist who was awarded the Nobel prize for chemistry in 1907. His works included the synthesis of diiodoacetamid through alcoholic fermentation caused by enzymes, as well as the discovery of zymase, the first enzyme to be isolated. He received his Ph.D. at the University of Munich, where he became a lecturer. Later, he taught and performed research at Tubingen, Berlin, and Wurzburg.

Buchner method of ring enlargement. Diazoacetic acid ester reacts with benzene and homologs to give the corresponding esters of noncaradienic acid, transformed at high temperatures to derivatives of cycloheptatriene, phenylacetic acid, and β-phenylpropionic acid (when one or more methyl groups are present in the initial hydrocarbon).

bucket elevator. See conveyor (5).

buckminsterfullerene. (buckyballs). C_{60}.



Spherical aromatic molecule with a hollow truncated-icosahedron structure, similar to a soccer ball. First reported in the mid-1980s. Capable of enclosing ions or atoms in a host-guest relationship.

buckyballs. See buckminsterfullerene.

buclizine hydrochloride. $C_{28}H_{33}ClN_2 \cdot 2HCl$.
1-p-chlorobenzhydryl-4-(p-(tert)-butylbenzyl)piperazinedihydrochloride.
Use: Medicine (antihistamine).

Budde effect. The increase in volume of halogen vapors on exposure to light.

"Budium" [*Du Pont*]. TM for a polybutadiene finish for application to tin plate.

buffer. A solution containing both a weak acid and its conjugate weak base, whose pH changes only slightly on addition of acid or alkali. The weak acid becomes a buffer when alkali is added, and the weak base becomes a buffer when acid is added. This action is explained by the reaction

$$A + H_2O \rightarrow B + H_3O_n$$

in which the base B is formed by the loss of a proton from the corresponding acid A. The acid

may be a cation such as NH_4^+, a neutral molecule such as CH_3COOH, or an anion such as $H_2PO_4^-$. When alkali is added, hydrogen ions are removed to form water, but as long as the added alkali is not in excess of the buffer acid, many of the hydrogen ions are replaced by further ionization of A to maintain the equilibrium. When acid is added, this reaction is reversed as hydrogen ions combine with B to form A. The pH of a buffer solution may be calculated by the mass-law equation, $pH = pK' + \log C_b/C_a$, in which pK′ is the negative logarithm of the apparent ionization constant of the buffer acid and the concentrations are those of the buffer base and its conjugate acid.

bufotenine.
[3-(2-dimethylaminoethyl)-5-indolol].
$C_{12}H_{16}N_2O$.
Properties: Colorless prisms, insoluble in water, soluble in alcohol, slightly soluble in ether, soluble in dilute acids and alkalies.
Derivation: From toads and toadstools; also made synthetically.
Hazard: A hallucinogenic agent.
Use: Medicine (experimental).
See also hallucinogen.

builder detergent. A substance that increases the effectiveness of a soap or synthetic detergent by acting as a softener and as a sequestering and buffering agent. Phosphate-silicate formulations, once widely used, have been restricted for environmental reasons. They have largely been replaced by EDTA or by zeolites, sometimes combined with nitrolotriacetic acid. Certain starch derivatives can be used as builders.
See also zeolite.

bulan. (2-nitro-1,1-bis(p-chlorophenyl)butane).
CAS: 76-20-0. $C_{16}H_{15}Cl_2NO_2$.
Hazard: A toxic chlorinated nitrogenous compound used as an insecticide. When mixed with Prolan, the product is called Dilan.
See also Prolan, Dilan.

bulk density. See density.

bulking agent. Chemically inert material used for increasing volume.

bullion. Bulk precious metals as produced at refineries or gold-silver alloy produced in refining.

bunamiodyl.
$C_3H_7CONHC_6HI_3CH{:}C(C_2H_5)COONa$.
[3(3-Butyrylamino-2,4,6-tri-iodophenyl)-2-ethyl sodium acrylate].
Used in medicine (radiopaque contrast medium, diagnostic aid).

buna rubbers. German vulcanizable synthetic rubbers from butadiene with sodium as a catalyst.
See also rubber.

bunker fuel oil. A heavy residual oil used as fuel by ships, by industry, and for large-scale heating installations.

Bunsen burner. Common laboratory burner which allows regulation of the air to be mixed with the gas before burning.

Bunsen, Robert Wilhelm. (1811–1899). Born in Germany, Bunsen is remembered chiefly for his invention of the laboratory burner named after him. He engaged in a wide range of industrial and chemical research, including blast-furnace firing, electrolytic cells, separation of metals by electric current, spectroscopic techniques (with Kirchhoff), and production of light metals by electrical decomposition of their molten chlorides. He also discovered two elements, rubidium and cesium.

buoyancy balance. Balance, made of silica, capable of extreme accuracy.
Use: To determine the density of gases.

burette. A liquid-measuring device used extensively in chemical laboratories. It is a vertical glass tube, open at the top, supported on a bracket, and equipped with scale graduation marks and a hand-operated stopcock at or near the bottom. The liquid to be dispensed is flowed in at the open end and can then be withdrawn in measured amounts by operating the stopcock.

Burgundy pitch. A resin obtained from Norway spruce or European silver fir. Other types, e.g., that from various species of pines, are also offered under this name. Characterized by extreme tackiness, soluble in acetone and alcohol. Used to some extent in surgeon's tape and various special adhesive compositions.

burlap. A coarse, loose-woven fabric made from jute or similar fiber, used in low-cost laminated composites; as liner or backing in upholstery, carpets, etc., and as a bagging material. It is often impregnated with hot-melt adhesive.

burnable poison. A neutron absorber (poison) such as boron which when incorporated in the fuel or fuel cladding of a nuclear reactor, gradually "burns up" (is changed into nonabsorbing material) under neutron irradiation. This process compensates for the loss of reactivity that occurs as fuel is consumed and fission-product poisons accumulate, and keeps the overall char-