The Condensed Chemical Dictionary

TENTH EDITION

Revised by

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for filament winding and a pelletized type for injection molding are available under the trademark "Arnox" (q.v.).
Hazard: Strong irritant to skin in uncured state.
Uses: Surface coatings, as on household appliances and gas storage vessels; adhesives for composites and for metals, glass, and ceramics; casting metal-forming tools and dies; encapsulation of electrical parts; filament-wound pipe and pressure vessels; floor surfacing and wall panels; neutron-shielding materials; cements and mortars; nonskid road surfacing; rigid foams; oil wells (to solidify sandy formations); matrix for stained glass windows.

EPR. Abbreviation for ethylene propylene rubber; also for electron paramagnetic resonance (q.v.).

epsilon acid (1-naphthylamine-3,8-disulfonic acid) $C_{10}H_5(NH)_2(SO_3H)_2$.
Properties: White crystalline scales; soluble in hot water.
Derivation: Naphthalene-1,5- and 1,6-sulfonic acids are nitrated and reduced, giving 1-naphthylamine-3,8- and 4,8-disulfonic acids. Separation is effected by crystallizing out the acid sodium salts of 1-naphthylamine-3,8-disulfonic acid.
Use: Azo dye intermediate.

Epsom salts. See magnesium sulfate.

EPT. Abbreviation for ethylene-propylene terpolymer (q.v.).

"Eptac No. 1."[28] Trademark for zinc dimethyldithiocarbamate, an ultra-accelerator for rubber.

"Eptam."[1] Trademark for a selective herbicide containing ethyl-N,N-di-n-propylthiolcarbamate.

EPTC (S-ethyl di-N,N-propylthiocarbamate) $C_2H_5SC(O)N(C_3H_7)_2$. A pre-emergence herbicide. Available in liquid and granular formulations.

eq. Abbreviation for gram equivalent weight, i.e., the equivalent weight in grams. Recommended as an international unit.

equilibrium. (1) Chemical equilibrium is a condition in which a reaction and its opposite or reverse reaction occur at the same rate, resulting in a constant concentration of reactants; for example, ammonia synthesis is at equilibrium when ammonia molecules form and decompose at equal velocities ($N_2 + 3H_2 \rightleftharpoons 2NH_3$).

(2) Physical equilibrium is exhibited when two or more phases of a system are changing at the same rate, so that the net change in the system is zero. An example is the liquid-to-vapor/vapor-to-liquid interchange in an enclosed system, which reaches equilibrium when the number of molecules leaving the liquid is equal to the number entering it.

equilibrium constant. A number that relates the concentrations of starting materials and products of a reversible chemical reaction to one another. For example, for a chemical reaction represented by the equation $aAB + bCD \rightleftharpoons cAD + dBC$, the equilibrium constant would be $K = [(AD)^c(BD)^d]/[(AB)^a(CD)^b]$ where a,b,c, and d are the numbers of molecules of AB, CD, AD and BC that occur in the balanced equation and (AD), (BC), (AB) and (CD) are the molecular concentrations of AD, BC, AB and CD in any mixture that is at equilibrium. At any one temperature, K is usually at least approximately constant regardless of the relative quantities of the several substances, so that when K is known, it is often possible to predict concentrations of products when those of the starting materials are known. The constant changes markedly with temperature. The constant can often be calculated from the relations of thermodynamics if the free energy for the chemical reaction is known, or can be calculated by measuring all concentrations in one or more carefully conducted experiments.

equivalent weight (combining weight). The weight of an element that combines chemically with 8 grams of oxygen or its equivalent. Since 8 grams of oxygen combines with 1.008 grams of hydrogen, the latter is considered equivalent to 8 grams of oxygen. When 8 grams is selected for the combining weight of oxygen, no element has a combining weight value of less than 1. The equivalent weight of an acid is the weight that contains one atomic weight of acidic hydrogen, i.e., the hydrogen that reacts during neutralization of acid with base. The equivalent weight of a base or hydroxide is the weight that will react with an equivalent weight of acid. Equivalent weights of other substances are defined in a similar manner.

Er Symbol for erbium.

"Erasol."[232] Trademark for a series of sulfoxylate reducing agents for use in the textile and paper industries.

"Eratrope."[232] Trademark for a series of discharge agents for removing vat dyes from cellulosic material.

erbia. See erbium oxide.

erbium Er. Element with atomic number 68; atomic weight 167.26; valence 3. One of the rare earth elements of the yttrium subgroup. See rare earth metals.
Properties: Soft, malleable solid with metallic luster; insoluble in water; soluble in acids; salts are pink to red; sp. gr. 9.16 (15°C); m.p. 1522°C; b.p. 2500°C (approx). Toxicity low. High electrical resistivity.
Derivation: Reduction of the fluoride with calcium; electrolysis of the fused chloride.
Source: Rare earth minerals.
Forms: Lumps; ingots of high purity; sponge; powder.
Hazard: Flammable in finely divided form.
Uses: Nuclear control; special alloys; room-temperature laser.