

Hawley's
**Condensed Chemical
Dictionary**
Fourteenth Edition

Revised by
Richard J. Lewis, Sr.

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dewaxing tank bottoms, refinery residues, and other petroleum waste products; they have an average molecular weight of 500–800 (twice that of paraffin). Viscosity 45–120 sec (SUS at 98.9C), penetration value 3–33. Petroleum-derived products are used for adhesives, paper coating, cosmetic creams, floor wax, electrical insulation, heat-sealing, glass fabric impregnation, leather treatment, emulsions, etc. Some natural products, notably chlorophyll, are classed as microcrystalline waxes.

wax, polymethylene. White, odorless solid with congealing point of 96.1C. Offered in flaked form. Approved by FDA.

wax tailings. Brown, sticky, semiasphalt product obtained in the destructive distillation of petroleum tar just before formation of coke.

Use: Wood preservative, roofing paper.

“Weatherometer.” See aging (c).

web. A roll of paper as it comes from the fourdrinier machine and used to feed a rotary printing press.

weedkiller. See herbicide.

Weerman degradation. Formation of an aldehyde with one less carbon atom from an aldonic acid by a Hoffmann-type rearrangement of the corresponding amide. This is a general reaction of α -hydroxy carboxylic acids.

weight. See mass.

weighting agent. (1) In soft drink technology, an oil or oil-soluble compound of high specific gravity, such as a brominated olive oil, which is added to citrus flavoring oils to raise the specific gravity of the mixture to about 1.00, so that stable emulsions with water can be made for flavoring. (2) In the textile industry a compound used both to deluster and lower the cost of a fabric, at the same time improving its “hand” or feeling. Zinc acetylacetonate, clays, chalk, etc. are used.

welding. Joining or bonding of metals or thermoplastics by application of temperatures high enough to melt the materials so that they fuse to a permanent union on cooling. In general, the temperatures used for thermoplastics are considerably lower than required for metals. The following methods are used for metals: (1) An oxyacetylene flame is applied with a torch to the butted ends or edges of the pieces to be joined. (2) A method called brazing is similar to (1), except that a nonferrous filler alloy is inserted between the pieces. A number of alloys are used, e.g., Ag/Cu/Zn; the filler cannot be remelted. It forms an intermetallic compound at the interfaces. (3) In resistance welding, the heat is provided by the resistance to an electric current as it passes through the material. No filler metal is used. (4) In ultrasonic

welding, the heat source is the friction resulting from ultrasonic vibrations. It is a type of friction welding. (5) Electron-beam welding is a comparatively recent technique in which energy is supplied by a stream of electrons focused by a magnetic field under high vacuum. It is used for complicated weldments of tool steels.

The following methods are used for welding such thermoplastics as polyvinyl chloride, HDPE, polypropylene, and polycarbonates: (1) Hot gas technique, in which an electrically or gas-heated “gun” melts a rod of the same material as the parts to be joined. (2) Friction welding, in which heat is generated by rapid rubbing together of the two surfaces, one of which is held stationary while the other is rubbed against it at a speed great enough to cause softening. (3) Ultrasonic welding, which is also used for metals. See (4) above. See solder.

“Wellbrom” [Albemarle]. TM for sodium bromide solution, completion fluid.

Use: Completion, work-over and packer fluid in oil-field applications.

Werner, A. (1866–1919). A native of Switzerland, Werner was awarded the Nobel prize for his development of the concept of the coordination theory of valence, which he advanced in 1893. His ideas revolutionized the approach to the structure of inorganic compounds and in recent years have permeated this entire area of chemistry. The term *Werner complex* has largely been replaced by “coordination compound.”

Wessely-Moser rearrangement. Rearrangement of flavones and flavanones possessing a 5-hydroxyl group, through fission of the heterocyclic ring and reclosure of the intermediate diaroylmethanes in the alternate direction.

Weston cell. An electrical cell used as a standard that consists of an amalgamated cadmium anode covered with crystals of cadmium sulfate dipping into a saturated solution of the salt, and a mercury cathode covered with solid mercury sulfate.

Westphalen-Lettré rearrangement. Dehydration of 5-hydroxycholesterol derivatives accompanied by C-10 to C-5 methyl migration in compounds with a β -substituent in C-6.

wet deposition. See acid precipitation.

wetting agent. A surface-active agent that, when added to water, causes it to penetrate more easily into, or to spread over the surface of, another material by reducing the surface tension of the water. Soaps, alcohols, and fatty acids are examples. See detergent.