Isopropyl Alcohol Encyclopedia Article

Isopropyl Alcohol

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Isopropyl Alcohol

Overview

Isopropyl alcohol (EYE-so-PRO-pil AL-ko-hol) is a colorless flammable liquid with a sweet odor. In 2004, about 600 million kilograms (about 1.3 billion pounds) of isopropyl alcohol were produced in the United States, with about half of that used as an industrial solvent and about a third used in the preparation of other chemical compounds. It is perhaps best known to many people as rubbing alcohol, usually a 70 percent solution of isopropyl alcohol in water. The compound is commonly used to clean a person's skin before an injection is given. It kills bacteria on the skin and prevents infection.

Key Facts

Other Names:

2-propanol; isopropanol; rubbing alcohol

Formula:

$CH_3CHOHCH_3$

Elements:

Carbon, hydrogen, oxygen

Compound Type:

Alcohol (organic)

State:

Liquid

Molecular Weight:

60.10 g/mol

Melting Point:

−87.9°C (−126°F)

Boiling Point:

82.3°C (180°F)

Solubility:

Miscible with water and most common organic solvents

How It Is Made

The most popular industrial method for preparing isopropyl alcohol was invented in 1920 by researchers at the Standard Oil Company (now Exxon). In that process, propene (propylene; $CH_2CH=CH_2$) is treated with hydrolyzed with sulfuric acid as a catalyst.

Common Uses and Potential Hazards

Isopropyl alcohol dissolves many other organic compounds easily, so it finds wide use as a solvent for gums; essential and other kinds of oils; alkaloids; certain types of plastics; derivatives of cellulose; paints, varnishes, shellacs, and other types of coatings; and quick-drying inks. Essential oils are oils extracted from plants that have therapeutic value. Alkaloids are organic bases that contain the element nitrogen.

The synthesis of many important organic compounds begins with isopropyl alcohol as a raw material. Among these compounds are acetone, glycerol, and isopropyl acetate, itself widely used as a solvent for organic substances. Among the other uses to which isopropyl alcohol is put are:

- In household and personal care products, such as perfumes, hair dye rinses, nail polishes, shampoos, and after-shave lotions;
- In cleaning products, such as disinfectant soaps and hand and body lotions;
- In antifreezes and as a deicing agent;
- As a coolant in the manufacture of beers; and
- As a preservative for biological specimens.

Words to Know

HYDROLYSIS
- The process by which a compound reacts with water to form two new compounds.

MISCIBLE
- Able to be mixed; especially applies to the mixing of one liquid with another.

For Further Information

"Isopropanol." Spectrum Laboratories. http://www.speclab.com/compound/c67630.htm (accessed on October 12, 2005).

"Isopropyl Alcohol." New Jersey Department of Health and Senior Services. http://www.state.nj.us/health/eoh/rtkweb/1076.pdf (accessed on October 12, 2005).

"2-Propanol." International Programme on Chemical Safety. http://www.inchem.org/documents/sids/sids/67630.pdf (accessed on October 12, 2005).

See Also

Propylene