Product Safety Assessment

Isobutyl Acetate

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Names
- CAS No. 110-19-0
- Acetic acid, isobutyl ester
- 2-Methyl-1-propyl acetate
- EC No. 203-745-1
- Acetic acid, 2-methylpropyl ester
- Isobutyl acetate

Product Overview
- Isobutyl acetate is a colorless solvent with medium volatility and a characteristic fruity ester odor. See Product Description.
- Isobutyl acetate is a volatile solvent for the manufacture and application of many types of finishes. It is also widely used in printing inks, aerosol sprays, coatings, thinners, sealants, adhesives, and personal-care products. It is used as a solvent for fragrances, cosmetics, and personal care, and as a processing solvent in the pharmaceutical industry. See Product Uses.
- Exposure to isobutyl acetate may cause moderate eye irritation or slight corneal injury. Brief contact with the skin may cause slight irritation with local redness, but may cause a more severe response on covered skin (under clothing or gloves). Prolonged skin contact is unlikely to result in absorption of harmful amounts. At room temperature, exposure to vapor is minimal due to low volatility. Single exposure is not likely to be hazardous; however, excessive exposure may cause irritation to the upper respiratory tract (nose and throat) and lungs. Symptoms of excessive exposure include anesthetic or narcotic effects and dizziness and drowsiness may be observed. Small amounts of isobutyl acetate swallowed incidental to normal handling operations are not likely to cause injury. However, swallowing larger amounts may cause injury. See Health Information.
- Dow does not sell isobutyl acetate for direct consumer use, but it is used as a raw material in paints or coatings that could be used by consumers. See Exposure Potential.
- Although isobutyl acetate is stable under recommended storage conditions, exposure to elevated temperatures can cause the product to decompose. See Physical Hazard Information.

Manufacture of Product
- Location—Dow produces isobutyl acetate at facilities in Texas City, TX.
- Process—Dow starts by reacting a mixed olefins stream with synthesis gas in the “oxo” process to make various aldehydes, which in turn are used to make a variety of solvents.
Isobutyraldehyde is used to make isobutyl alcohol, which is reacted with acetic acid to produce isobutyl acetate. The final reaction is shown below.

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\begin{align*}
\text{CH}_3 & \quad \text{CH} & \quad \text{CH}_2\text{OH} & \quad + & \quad \text{O} & \quad \text{C} & \quad \text{CH}_3 \\
\text{H}_3\text{C} & \quad \text{CH} & \quad \text{CH}_2\text{OH} & \quad + & \quad \text{O} & \quad \text{C} & \quad \text{CH}_3 \\
& \quad \text{[Catalyst]} & \quad \rightarrow & \quad & \quad \\
\text{H}_3\text{C} & \quad \text{CH} & \quad \text{CH}_2\text{OH} & \quad + & \quad \text{H}_2\text{O} & \quad & \quad \\
\end{align*}
\]

Product Description
Isobutyl acetate is a colorless solvent with medium volatility and a characteristic fruity ester odor. It has good solvency characteristics for polymers, resins, oils, and cellulose nitrate and is miscible with all common organic solvents. Its structure contributes to effective viscosity reduction and to improved solvent diffusion from coating films. It has strong solvency and proper volatility for high-solids coatings and printing-ink applications. Its high electrical-resistivity properties provide advantages in formulating high-solids coatings for electrostatic spray applications.

Product Uses
Essentially all isobutyl acetate is used as a solvent for paints and surface coatings, mainly in solvent-borne wood furniture varnishes and, to a lesser degree, in architectural coatings, with some use in inks and adhesives. Isobutyl acetate is an economical replacement for methyl isobutyl ketone (MIBK), toluene, or n-butyl acetate in many formulations. It can replace n-butyl acetate if the coating needs to dry more quickly. Other applications include cleaners, adhesives, extraction solvent, cosmetics, personal care and fragrance solvent.

Exposure Potential
Isobutyl acetate is used in the formulation of industrial and consumer products. Based on the uses for isobutyl acetate, the public could be exposed through:

- **Workplace exposure** – Exposure can occur either in an isobutyl acetate manufacturing facility or in the various industrial or manufacturing facilities that use isobutyl acetate. Those working with isobutyl acetate in manufacturing operations could be exposed during maintenance, sampling, testing, or other procedures. Use gloves and protective clothing that are chemically resistant to this material. Chemical goggles should be worn during handling operations. For emergency conditions, use an approved positive-pressure, self-contained breathing apparatus (SCBA). In confined or poorly ventilated areas, use an approved self-contained breathing apparatus or positive pressure air line with auxiliary self-contained air supply. Each manufacturing facility should have a thorough training program for employees and appropriate work processes and safety equipment in place to limit unnecessary exposure. See Health Information.

- **Consumer exposure to products containing isobutyl acetate** – Dow does not sell isobutyl acetate for direct consumer use, but it is used in paints and coatings that could be used by consumers. Consumers should read and follow instructions on product labels to minimize exposure to iso-butyl acetate and ensure safe handling of the consumer product. Consumers may also be exposed to isobutyl acetate from ingestion of foods that contain isobutyl acetate as a natural product or as a flavorant. See Health Information.

- **Environmental releases** – In the event of a spill, the focus is on containing the spill to prevent contamination of soil and surface or ground water. Respiratory protection is necessary for cleaning up spills and leaks. Eliminate all sources of ignition immediately. For small spills, isobutyl acetate should be absorbed with materials such as sand. Keep upwind
of the spill. Vapors may travel a long distance, and ignition and/or flash back can occur. Stay out of low areas where fumes can accumulate. Isolate the area. The material may float on water, and runoff may create an explosion or fire hazard if ignited. See Environmental, Health, and Physical Hazard Information.

- **Large release** – Industrial spills or releases are infrequent and generally contained. If a large spill does occur, the material should be captured, collected, and reprocessed, or disposed of according to applicable governmental requirements. A positive pressure, self-contained breathing apparatus (SCBA) with a full-face mask approved by NIOSH is recommended for emergency work. Eliminate all sources of ignition immediately. Use only explosion-proof equipment, and ground and bond all containers and handling equipment.

- **In case of fire** – Deny any unnecessary entry into the area and consider the use of unmanned hose holders. Flammable mixtures of this product are readily ignited, even by static discharge. Ignition and/or flash back may occur. Use of a direct water stream may spread the fire. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. Vapors are heavier than air and may travel a long distance and accumulate in low-lying areas. Warn the public of downwind explosion hazard. Keep vapors out of sewers. Follow emergency procedures carefully. See Environmental, Health, and Physical Hazard Information.

For more information, see the relevant Safety Data Sheet.

**Health Information**

This product is a "hazardous chemical" as defined by the U.S. Department of Labor Occupational Safety and Health Administration (OSHA) Hazard Communication Standard, 29 CFR 1910.1200.

**Eye and skin contact** – Exposure to isobutyl acetate may cause moderate eye irritation or slight corneal injury. Brief skin contact may cause slight irritation with local redness. Skin reaction may be more severe if the chemical is exposed to covered skin (under clothing, gloves). Prolonged skin contact is unlikely to result in absorption of harmful amounts. Isobutyl acetate does not cause allergic skin reactions.

**Inhalation** – At room temperature, exposure to vapor is minimal due to low volatility. Single exposure is not likely to be hazardous; however, excessive exposure may cause irritation to the upper respiratory tract (nose and throat) and lungs. Symptoms of excessive exposure include anesthetic or narcotic effects, and dizziness and drowsiness.

**Ingestion** – Small amounts of isobutyl acetate swallowed incidental to normal handling operations are not likely to cause injury. However, swallowing larger amounts may cause injury. Aspiration into the lungs may occur during ingestion or vomiting, causing lung damage or even death due to chemical pneumonia. In the case of ingestion, the decision of whether to induce vomiting or not should be made by a physician.

**Other** – *In vitro* genetic toxicity studies of isobutyl acetate exposure were negative. Available data on isobutanol, a direct metabolite of isobutyl acetate, have indicated no significant effects on
reproduction or fetal development even at doses which caused toxic effects in the mother. Isobutanol has been reported to cause liver and central nervous system effects following repeated inhalation exposures at high doses.

For more information, see the relevant Safety Data Sheet.

Environmental Information

The bioconcentration potential of isobutyl acetate is low and potential for mobility in soil is very high. The material is readily biodegradable. Isobutyl acetate is slightly toxic to aquatic organisms on an acute basis.

For more information, see the relevant Safety Data Sheet.

Physical Hazard Information

Although isobutyl acetate is stable under recommended storage conditions, exposure to elevated temperatures can cause the material to decompose. Decomposition products depend upon temperature, air supply, and the presence of other materials, but can include carbon monoxide and carbon dioxide. During a fire, smoke may contain the original material in addition to toxic and/or irritating combustion products of varying composition.

For more information, see the relevant Safety Data Sheet.

Regulatory Information

Regulations may exist that govern the manufacture, sale, transportation, use, and/or disposal of isobutyl acetate. These regulations may vary by city, state, country, or geographic region. Information may be found by consulting the relevant Safety Data Sheet, Technical Data Sheet, or Contact Us.

Additional Information

- Safety Data Sheet (http://www.dow.com/webapps/msds/msdssearch.aspx)
- Contact Us (http://www.dow.com/oxysolvents/contact/index.htm)
- Isobutyl Acetate, Urethane Grade, Material Safety Data Sheet, The Dow Chemical Company, August 7, 2007

For more business information about isobutyl acetate, visit Dow’s Oxygenated Solvents web site at: http://www.dow.com/oxysolvents/.
References
1 Isobutyl Acetate Technical Data Sheet, The Dow Chemical Company, Form No. 327-00023-1001
2 Oxygenated Solvents, The Dow Chemical Company, Form No. 327-00001-0106XBBI
3 Dow’s Oxygenated Solvents web site: http://www.dow.com/oxysolvents/app/
4 Isobutyl Acetate, Urethane Grade, Safety Data Sheet for the US, The Dow Chemical Company
8 Macku, C. and Jennings, W.G., “Analysis of volatile fruit components by headspace solid-phase
10 Urbach, G., “Dynamic Headspace Gas Chromatography of Volatile Compounds in Milk,” J.
NOTICES:

As part of its 2015 Sustainability Goals, Dow has committed to make publicly available safety assessments for its products globally. This product safety assessment is intended to give general information about the chemical (or categories of chemicals) addressed. It is not intended to provide an in-depth discussion of health and safety information. Additional information is available through the relevant Safety Data Sheet, which should be consulted before use of the chemical. This product safety assessment does not replace required communication documents such as the Safety Data Sheet.

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