Product Safety Assessment

*n-Butyl Acetate*

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**Names**
- CAS No. 123-86-4
- n-Butyl acetate
- Butyl ethanoate
- EC No. 204-658-1
- Acetic acid, n-butyl ester
- n-Butyl ester acetic acid

**Product Overview**
- n-Butyl acetate is a colorless solvent with medium volatility and a characteristic fruity ester odor. ¹ See Product Description.
- n-Butyl acetate is used as a solvent for the manufacture and application of many types of coatings and finishes. It is also used in printing inks, aerosol sprays, fragrances, cosmetics, and personal-care products and as a processing solvent in the chemical and pharmaceutical industries.² See Product Uses.
- n-Butyl acetate has low toxicity if swallowed. Skin contact is unlikely to result in the absorption of harmful amounts. Brief contact with skin is essentially non-irritating; however, prolonged contact may cause severe skin irritation with local redness and discomfort. The liquid and vapor may cause moderate eye irritation, experienced as mild discomfort and redness. Excessive inhalation exposure may cause irritation to the upper respiratory tract and lungs. Symptoms of excessive exposure may be anesthetic or narcotic effects, and dizziness or drowsiness may be observed.³ See Health Information.
- Dow does not sell n-butyl acetate for direct consumer use, but it is used as a solvent in applications in which the final product is used by consumers. See Exposure Potential.
- n-Butyl acetate, both liquid and vapor, is flammable. It is stable under recommended storage conditions. However, exposure to elevated temperatures can cause the product to decompose, releasing toxic gases. ³ See Physical Hazard Information.

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**Manufacture of Product**
- **Capacity**⁴⁵ – Dow produces n-butyl acetate in the U.S. at facilities in Texas City, Texas.
• **Process**\(^6\) – n-Butyl acetate is usually made by reacting n-butanol with acetic acid according to the reaction shown below.

\[
\begin{align*}
\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH} + \text{CO} - \text{CH}_3 &\xrightarrow{[\text{Catalyst}]} \text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{O} - \text{CH}_3 + \text{H}_2\text{O} \\
n\text{-Butanol} &\quad \text{Acetic acid} &\quad \text{n-Butyl acetate} &\quad \text{Water}
\end{align*}
\]

**Product Description**\(^1,2\)

n-Butyl acetate is a colorless solvent with medium volatility and a characteristic fruity ester odor. It has excellent solvency characteristics for polymers, resins, oils, and cellulose nitrate and is miscible with all common organic solvents. Its linear structure contributes to effective viscosity reduction and to improved solvent diffusion from coating films. Its odor characteristics are significantly more favorable than other solvents of similar volatility, and its high electrical resistivity is an advantage in formulating high-solids coatings for electrostatic spray applications.

**Product Uses**\(^1,2,7\)

n-Butyl acetate is used as a solvent for the manufacture and application of many types of finishes. It is used in paints and coatings, printing inks, aerosol sprays, and personal-care products, as well as fragrances, and cosmetics. It is also used as an extraction and processing solvent in the chemical and pharmaceutical industries.

**Exposure Potential**\(^3\)

n-Butyl acetate is used in the production of industrial and consumer products. Based on the uses for n-butyl acetate, the public could be exposed through:

• **Workplace exposure** – Exposure can occur either in an n-butyl acetate manufacturing facility or in the various industrial or manufacturing facilities that use n-butyl acetate. Those working with n-butyl acetate in manufacturing operations could be exposed during maintenance, sampling, testing, formulation of finished products, or other procedures. Each manufacturing facility should have a thorough training program for employees and appropriate work processes and safety equipment in place to limit unnecessary n-butyl acetate exposure. See Health Information.

• **Consumer exposure to products containing n-butyl acetate** – Dow does not sell n-butyl acetate for direct consumer use, but it is used as a solvent in applications where the final product is used by consumers. Consumers should read and follow instructions on product labels to minimize exposure to n-butyl acetate and ensure safe handling of the consumer product. 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, n-butyl acetate should be absorbed with materials such as sand. This material is considered slightly toxic to aquatic organisms on an acute basis. The high vapor pressure and low solubility in water make n-butyl acetate tend to accumulate in the air, which may create an inhalation risk. 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. If available, use foam to smother or
suppress the vapors. 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. Keep upwind of spill. 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. Water may not be effective in extinguishing fire. Use water spray to cool containers exposed to the fire and in the fire-affected zone until the fire is out and the danger of re-ignition has passed. 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. The public should be warned of downwind vapor explosion hazards. Vapors may travel a long distance and accumulate in low-lying areas. Keep vapors out of sewers. Flammable mixtures may exist within the vapor space of containers, even at room temperature. Follow emergency procedures carefully. See Environmental, Health, and Physical Hazard Information.

For more information, see the relevant Safety Data Sheet.

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**Health Information**

**Eye and skin contact** – Liquid contact with the eye may cause moderate eye irritation. Vapor exposure may cause eye irritation, experienced as mild discomfort and redness. Brief contact is essentially non-irritating to skin, however prolonged contact may cause severe skin irritation with local redness and discomfort. Skin exposure may cause drying and flaking of the skin. Prolonged skin contact is unlikely to result in absorption of harmful amounts. Allergic skin reactions have not been reported in animals or humans following repeated contact with n-butyl acetate.

**Inhalation** – Excessive inhalation exposure may cause irritation to the upper respiratory tract (nose and throat) and lungs. Symptoms of excessive exposure may be anesthetic or narcotic effects, and dizziness and drowsiness may be observed.

**Ingestion** – n-Butyl acetate has very low toxicity if swallowed. Harmful effects are not anticipated from swallowing small amounts. However, aspiration into the lungs may occur during ingestion or vomiting, causing lung damage or even death due to chemical pneumonia. Do not induce vomiting.

**Other** – n-Butyl acetate has been toxic to the fetus in lab animals at doses that are not toxic to the mother. Data in laboratory animal studies, effects on reproduction have been seen only at doses that produced significant toxicity to the parent animals. *In vitro* genetic toxicity studies were negative.

For more information, see the relevant Safety Data Sheet.

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Environmental Information
The bioconcentration potential for n-butyl acetate is low, and it is readily biodegradable. The potential for mobility in soil is very high. n-Butyl acetate is slightly toxic in aquatic organisms on an acute basis.

For more information, see the relevant Safety Data Sheet.

Physical Hazard Information
n-Butyl acetate is stable under recommended storage conditions. However, exposure to elevated temperatures can cause the product to decompose. Decomposition products can include toxic gases such as carbon monoxide and carbon dioxide.

n-Butyl acetate, both liquid and vapor, is flammable. Flammable mixtures may exist within the vapor space of n-butyl acetate containers, even at room temperature. Keep containers closed. Minimize sources of ignition, such as static build-up, heat, spark, or open flame.

Avoid contact with nitrates, strong acids, strong bases, strong oxidizers, or strong reducing agents.

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 n-butyl acetate. These regulations may vary by city, state, country, or geographic region. Information may be found by consulting the relevant Safety Data Sheet, Product Information 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)

For more business information about n-butyl acetate, visit Dow’s Oxygenated Solvents web site at: http://www.dow.com/oxysolvents/.
References

1. *n-Butyl Acetate Technical Data Sheet*, The Dow Chemical Company, Form No. 327-00022-0405
3. *n-Butyl Acetate Urethane Grade Safety Data Sheet for the US*, The Dow Chemical Company
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