Product Safety Assessment

2-Ethylhexoic Acid

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Names
• CAS No. 149-57-5
• 2-Ethylhexoic acid
• 2-Ethyl-1-hexanoic acid
• EC No. 149-57-5
• 3-Heptanecarboxylic acid
• 2-Ethylcaproic acid

Product Overview
• 2-Ethylhexoic acid (2-EHA) is a colorless, oily liquid with a pungent odor. It does not mix with water and has low volatility (does not evaporate easily). For further details, see Product Description.
• 2-EHA is mainly used as a chemical intermediate for the manufacture of polyvinylchloride (PVC) stabilizers, plasticizers, coating driers, synthetic lubricants, and pharmaceuticals. It is also used as a catalyst. For further details, see Product Uses.
• Because 2-EHA is used to manufacture a broad range of products, worker exposure is possible. Consumer exposure is unlikely. For further details, see Exposure Potential.
• Eye contact with 2-EHA may cause slight eye irritation and slight corneal injury. Brief skin contact may cause slight irritation with local redness. Prolonged skin contact with 2-EHA may cause severe irritation with local redness, discomfort and drying and flaking of the skin. Vapor from heated material may cause irritation of the nose and throat. For further details, see Health Information.
• 2-EHA is readily biodegradable, unlikely to bioaccumulate in the food chain, and is slightly toxic to fish and aquatic organisms.
• 2-EHA is stable under recommended storage conditions. Avoid contact with amines, ammonia, strong bases, carbon steel, copper, and copper alloys. For further details, see Physical Hazard Information.
Manufacture of Product

- **Capacity** – Dow manufactures 2-EHA at facilities in Texas City, Texas, in the United States.
- **Process** – Dow manufactures 2-EHA by a condensation reaction between two molecules of n-butyraldehyde. The resulting aldehyde, 2-ethylhexanal, is then oxidized to 2-EHA. The chemical reaction is as follows:

\[
2 \text{CH}_3\text{CH}_2\text{CH}_2\text{C} = \text{O} \xrightarrow{1. [\text{OH}^-]} \text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_{2}\text{CH} = \text{O} \quad \text{[H}_2]\]

\[
\xrightarrow{2. [\text{H}_2]} \text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_{2}\text{CH} = \text{O} \quad [\text{O}_2]\]

\[
\xrightarrow{2. [\text{O}_2]} \text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_{2}\text{CH} = \text{O} \quad \text{OH}
\]

n-Butyraldehyde 2-Ethylhexanal 2-Ethylhexoic acid

Product Description

2-EHA is a colorless, oily liquid with a pungent odor. It does not mix with water and has low volatility (does not evaporate easily).

Product Uses

2-Ethylhexoic acid (2-EHA) is mainly used as a chemical intermediate for the following applications:
- 2-EHA metal salts are added to paints and inks to accelerate drying
- Ester type lubricants are commonly used in refrigerators and air conditioners
- Plasticizers for the interlayer of safety glass for automotive windshields
- PVC stabilizers
- Catalysts
- Pharmaceuticals
- Antifreeze additives, to prevent corrosion by forming a protective barrier

Exposure Potential

2-EHA is used in the production of industrial and consumer products. Based on the uses for 2-EHA, the public could be exposed through:
- **Workplace exposure** – Exposure can occur either in a 2-EHA manufacturing facility or in the various industrial or manufacturing facilities that use it. Those working with 2-EHA in manufacturing operations could be exposed during maintenance, sampling, testing, or other procedures. Each 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 2-EHA** – Dow does not sell 2-ethylhexoic acid for direct consumer use. 2-EHA is an industrial chemical used as an intermediate to manufacture products, making direct consumer exposure unlikely. See Health Information.
- **Environmental releases** – 2-EHA has very low volatility and slowly evaporates from products that contain it. Although the substance is only slightly soluble in water, once it is dissolved, it will have a tendency to remain in water. Because 2-EHA is readily biodegradable, it will be treated by sewage treatment plants. For small spills, collect the material in suitable and properly labeled containers. See Environmental, Health, and Physical Hazard Information.
- **Large release** – Industrial spills or releases are infrequent and generally contained. If a large spill does occur, dike the area to contain the spilled material. Isolate the area and evacuate.
unnecessary personnel. Keep upwind of the spill. Pump recovered material into suitable and properly labeled containers. Use appropriate safety equipment.

- **In case of fire** – Keep people away and deny unnecessary entry. Wear positive-pressure, self-contained breathing apparatus (SCBA) and protective fire-fighting clothing. Avoid contact with this material during fire-fighting operations. Use water fog or fine spray, dry-chemical or carbon-dioxide fire extinguishers, or foam. **Do not use** a direct water stream as it may spread the fire. 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**¹

**Eye and Skin Contact** – Eye contact with 2-EHA may cause slight irritation with slight corneal injury. Brief skin contact may cause slight irritation with local redness. Prolonged skin contact with 2-EHA may cause severe irritation with local redness and discomfort and drying and flaking of the skin.

**Inhalation** – At room temperature, exposure to vapor is minimal due to low volatility. Vapor or mist from heated material may cause irritation of the nose and throat.

**Ingestion** – 2-EHA has low systemic toxicity if small amounts are swallowed; however, swallowing larger amounts may cause injury. Aspiration into the lungs may occur during ingestion or vomiting, causing tissue damage or lung injury.

**Toxicity Information** – In laboratory animal studies, 2-EHA has been toxic to the fetus at doses nontoxic to the mother and effects on reproduction have been seen only at doses that produced paternal toxicity. 2-EHA tested in in vitro and animal genetic toxicity studies were negative.

For more information, see the relevant Safety Data Sheet.

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**Environmental Information**¹

2-EHA has very low volatility and slowly evaporates from products that contain it. Although the substance is only slightly soluble in water, once it is dissolved, it will have a tendency to remain in water. It has minimal tendency to bind to soil or sediment.

2-EHA is unlikely to persist in the environment. The substance is readily biodegradable, which suggests the chemical will be removed from water and soil environments, including biological wastewater treatment plants.

2-EHA is not likely to accumulate in the food chain (bioconcentration potential is low). It is slightly toxic to fish and other aquatic organisms on an acute basis.

For more information, see the relevant Safety Data Sheet.
Physical Hazard Information

2-EHA is stable under recommended storage conditions and should be stored in its original container. Exposure to elevated temperatures can cause the product to decompose. Avoid contact with amines, ammonia, strong bases, carbon steel, copper, and copper alloys.

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 2-EHA. 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

- Contact Us (http://www.dow.com/oxysolvents/contact/index.htm).


References

1 2-Ethylhexoic Acid Safety Data Sheet, The Dow Chemical Company, ID No. 1004/1001
2 2-Ethylhexoic Acid Technical Data Sheet, The Dow Chemical Company, Form No. 327-00020-0405
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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Form No. 233-00421-MM-1214X