Product Safety Assessment

Valeric Acid

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Names
- CAS No. 109-52-4
- Valeric acid
- Pentanoic acid
- Valerianic acid
- EC No. 203-677-2
- Butanecarboxylic acid
- Propylacetic acid

Product Overview
- Valeric acid is a colorless liquid with an unpleasant odor.¹ For further details, see Product Description.
- Valeric acid is mainly used as a chemical intermediate to manufacture flavors and perfumes, synthetic lubricants, agricultural chemicals, and pharmaceuticals. It is also used as a flavoring aid in foods.¹² For further details, see Product Uses.
- Valeric acid is considered safe as a food additive by the World Health Organization (WHO).³ Eye contact with concentrated valeric acid may cause chemical burns resulting in severe irritation with corneal injury. Permanent impairment of vision or blindness may occur. Brief skin contact may cause burns along with pain, severe local redness, swelling, and tissue damage. Prolonged skin contact may result in absorption of harmful amounts. Excessive inhalation may cause irritation to the nose and throat.⁴ For further details, see Health Information.
- Because valeric acid is used to manufacture a broad range of products, worker exposure is possible.⁴ Consumers could come into contact with valeric acid by eating foods flavored with it.⁵ For further details, see Exposure Potential.
- Valeric acid liquid and vapor are combustible. Valeric acid is stable at typical storage and use temperatures. Avoid contact with oxidizing materials, amines, ammonia, and strong acids and strong bases.⁴ For further details, see Physical Hazard Information.

Manufacture of Product⁶
- Capacity – The Dow Chemical Company (Dow) manufactures valeric acid at facilities in Texas City, Texas, in the United States.
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- **Process** – Dow manufactures valeric acid using the oxo process. Butylene is reacted with synthesis gas (carbon monoxide and hydrogen mixture) in the presence of a catalyst, yielding valeraldehyde. Valeraldehyde is then oxidized to valeric acid.

\[
\text{C}_3\text{H}_7\text{CH}_2\text{CO}/\text{H}_2 + \frac{1}{2}\text{O}_2 \rightarrow \text{C}_3\text{H}_7\text{CH}_2\text{COOH}
\]

**Product Description**\(^1,5\)
Valeric acid is a colorless, oily liquid with an unpleasant odor. It is highly corrosive and must be handled with care.

**Product Uses**\(^1,7,8,9\)
Valeric acid is mainly used as a chemical intermediate for the following applications:
- Ester type lubricants used in aviation turbine oils, fire-resistant hydraulic fluids, and refrigerator oils
- Flavors and perfumes
- Plasticizers
- Vinyl stabilizers
- Specialty chemicals

Other uses for valeric acid include:
- Food additive for synthetic flavor and as a flavor enhancer
- As an odorant in pesticide formulations for use on crops [at concentrations of not more than 2% as outlined in EPA's 40 CFR part 180.920; formerly 40 CFR 180.1001(d)]

**Exposure Potential**
Valeric acid is used in the production of industrial and consumer products. Based on the uses for valeric acid, the public could be exposed through:
- **Workplace exposure**\(^4\) – Exposure can occur either in a valeric acid manufacturing facility or in the various industrial or manufacturing facilities that use it. Those working with valeric acid in manufacturing operations could be exposed during maintenance, sampling, testing, or other procedures. Agricultural workers could be exposed while applying pesticide formulations containing it. 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 valeric acid**\(^5\) – Dow does not sell valeric acid for direct consumer use. The highest potential for consumer exposure is from eating foods flavored with it. Because valeric acid readily evaporates and biodegrades, consumer exposure resulting from its use in pesticide formulations will be much smaller than from its use as a food additive. See Health Information.
• **Environmental releases** – In the event of a spill, the focus is on containing the spill to prevent contamination of soil, ditches, sewers, waterways, or groundwater. 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. Eliminate all sources of ignition. Pump the 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 [Safety Data Sheet](#).

### Health Information

Valeric acid is considered safe as a food additive by the World Health Organization (WHO).

**Eye and Skin Contact** – Valeric acid is considered corrosive to eye and skin. Eye contact with valeric acid may cause severe irritation and burns with corneal injury, possibly resulting in permanent impairment of vision, even blindness. Chemical burns may occur. Prolonged skin contact may cause burns along with pain, severe local redness, swelling, and tissue damage. Prolonged or widespread skin contact may result in absorption of harmful amounts.

**Inhalation** – Inhaling excessive amounts of valeric acid may cause irritation to the nose and throat.

**Ingestion** – Valeric acid has low toxicity if swallowed. Swallowing small amounts as a result of normal handling operations is unlikely to cause injury; however, swallowing larger amounts may cause injury.

**Cancer and Birth Defect Information** – Valeric acid has caused tumors in skin-painting tests in animals. These findings are believed to be secondary to chronic irritation and tissue injury. Valeric acid is toxic to the fetus in lab animals at doses toxic to the mother. Valeric acid has been found to be negative in in vitro and animal genetic toxicity studies.

For more information, see the [Safety Data Sheet](#).

### Environmental Information

Valeric acid is not likely to accumulate in the food chain (bioconcentration potential is low). It is expected to degrade rapidly in the environment with ultimate (complete) aerobic degradation estimated in days.

Valeric acid is slightly toxic to aquatic organisms on an acute basis. It may decrease the pH of aquatic systems to less than pH 5, which may be toxic.

For more information, see the [Safety Data Sheet](#).
Physical Hazard Information
Valeric acid liquid and vapors are combustible. Valeric acid is thermally stable at typical use temperatures. Elevated temperatures can cause it to decompose. Decomposition products depend on temperature, air supply, and the presence of other materials.

Valeric acid is incompatible with oxidizing materials, amines, ammonia, and strong acids and strong bases and contact should be avoided.

For more information, see the Safety Data Sheet.

Regulatory Information
Regulations may exist that govern the manufacture, sale, transportation, use, and/or disposal of valeric acid. 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).
- Valeric Acid Technical Data Sheet, The Dow Chemical Company, Form No. 327-00048-0812 (http://msdssearch.dow.com/PublishedLiteratureDOWCOM/dh_08ae/0901b803808ae5fe.pdf?filepath=oxysolvents/pdfs/noreg/327-00048.pdf&fromPage=GetDoc)


References
1 Valeric Acid Technical Data Sheet, The Dow Chemical Company, Form No. 327-00048-0812
4 Valeric Acid Safety Data Sheet, The Dow Chemical Company, ID No. 6016/1001


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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