

Product Safety Summary

Caprolactam

This Product Safety Summary is intended to provide a general overview of the chemical substance. The information on the Summary is basic information and is not intended to provide emergency response information, medical information or treatment information. The summary should not be used to provide in-depth safety and health information. In-depth safety and health information can be found on the Material Safety Data Sheet (MSDS) for the chemical substance.

Chemical Identity

Abbreviation:	Caprolactam
CAS Number:	105-60-2
Common Names:	Hexahydro-2H-azepin-2-one Epsilon-caprolactam

Product Overview

- Caprolactam is sold as molten liquid, as solid tablets and as flakes.
- Caprolactam is used as a raw material in the manufacture of nylon 6 used in synthetic fibers, plastics, and film. Caprolactam has small use in coatings, synthetic leather, plasticizers and paints.
- This material has been extensively tested for health effects. The primary potential hazards associated with caprolactam are irritation of the eyes, skin and respiratory tract and possible skin sensitization.
- Contact with molten (liquid) caprolactam may cause burns.
- The Occupational Safety and Health Administration has not established a Permissible Exposure Limit for caprolactam. The American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV) is 5 mg per cubic meter of air as an Inhalable fraction and vapor for 8 hours. Several states, including Alaska, Michigan and New York enforce an 8 hour limit of 1mg/m³ for dusts and 5 ppm for vapors.
- For further safety and health information, request the current Material Safety Data Sheet (MSDS) for this substance.

Physical/Chemical Properties

- Caprolactam has a melting point of about 69°C, or 157°F.
- It is sold as flakes, tablets and molten liquid, but, consumers encounter it after it has been converted to other materials, such as carpet, fabrics, plastic parts or packaging film.
- With a flash point above 300°F, caprolactam is neither combustible nor flammable. It presents a low fire hazard.
- Caprolactam has generally low solubility in organic solvents and high solubility in water.

Health Information

Acute Hazards

Exposure to dusts and vapors from caprolactam may cause irritation of the eyes, skin and mucous membranes of the respiratory tract. Prolonged skin contact may cause sensitization and

dermatitis. Exposure to high concentrations can cause dizziness, headache and nausea. Animal studies indicate that overexposure may cause liver and kidney injury.

Effects on Respiratory System:

Workers exposed to vapors and dusts may experience irritation of the nasal passages, throat and respiratory tract.

Effects on Eyes:

Exposure to caprolactam vapors and dusts may cause eye irritation.

Effects on Skin:

Caprolactam is irritating to the skin. Prolonged exposure may cause sensitization and dermatitis. In industrial situations, hot molten material may cause thermal burns.

Effects on Ingestion:

This material is moderately toxic by ingestion. Workplace exposures by this route are considered to be insignificant and consumer exposures are non-existent due to the fact that it is an industrial chemical.

Chronic Hazards

Chronic (repeated) exposure has been reported to cause irritation, headaches and dermatitis in overexposed workers. Caprolactam was not teratogenic or embryotoxic in rats and rabbits when given orally at high doses. It has been reported to cause liver and kidney damage in animal studies. Several studies indicate that caprolactam does not cause cancer in humans. The International Agency for Research on Cancer (IARC) has included it in Group 4 (agents (mixtures) probably not carcinogenic to humans).

Environmental Information

Spills should be collected and disposed of in accordance with local, state and federal requirements. Caprolactam exhibits a low degree of toxicity to fish and other marine life; however, because it is highly soluble in water, it must not be released into untreated waters.

Additional Hazard Information

Store caprolactam away from acids, bases and oxidizers. It may react with oxidizers to form a polymer with heat formation.

The following safety recommendations must be observed:

- Maintain a dust-free workplace and avoid generating dusts during handling.
- Maintain adequate ventilation in all work areas to control vapors.
- Provide adequate firefighting equipment, including automatic sprinklers, in work and storage areas.

Exposure Potential

Because it is an industrial chemical, consumer exposure to caprolactam is insignificant.

Workplace exposure to caprolactam dusts and vapors must be limited through the use of engineering controls, such as ventilation and hoods. In general, skin and eye exposures are prevented through the use of protective eye and face equipment and impermeable gloves and clothing. Butyl rubber and nitrile rubber are among the materials suitable for providing protection.

Risk Management

Workers handling caprolactam can safely work with this material if adequately instructed and educated regarding proper handling procedures.

Ventilation must be available in work areas to control potential airborne dust and vapor exposures to acceptable levels.

Federal/Science Findings

United States Environmental Protection Agency (EPA)
<http://www.epa.gov/iris/subst/0357.htm>

National Institute for Occupational Safety and Health (NIOSH)
<http://www.cdc.gov/niosh/npg/npgd0097.html>
<http://www.epa.gov/ttn/atw/hlthef/caprolac.html>

Contact Information

<http://www.basf.com>

MSDS

http://worldaccount.basf.com/wa/PublicMSDS-en_US/Search

References

IMPORTANT: While the data and information contained herein are presented in good faith and believed to be accurate, it is provided for your guidance only. No warranties of any kind, either express or implied, are made regarding the data or information provided. Further, it is expressly understood that the data and information furnished by BASF hereunder are given gratis and BASF assumes no obligation or liability for the data and information given, all such data and information being given and accepted at your risk.