We create chemistry

Safety Data Sheet
Caprolactam liquid

1. Identification

Product identifier used on the label

Caprolactam liquid

Recommended use of the chemical and restriction on use

Recommended use*: industrial chemicals
Recommended use*: initial product for chemical syntheses; for the production of homopolymerisates and copolymerisates
Unsuitable for use: Not intended for sale to or use by the general public.

* The “Recommended use” identified for this product is provided solely to comply with a Federal requirement and is not part of the seller's published specification. The terms of this Safety Data Sheet (SDS) do not create or infer any warranty, express or implied, including by incorporation into or reference in the seller's sales agreement.

Details of the supplier of the safety data sheet

Company:
BASF CORPORATION
100 Park Avenue
Florham Park, NJ 07932, USA

Telephone: +1 973 245-6000

Emergency telephone number

24 Hour Emergency Response Information
CHEMTREC: 1-800-424-9300
BASF HOTLINE: 1-800-832-HELP (4357)

Other means of identification

Synonyms: Caprolactam

2. Hazards Identification

According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

Classification of the product

Acute Tox.	4 (Inhalation - dust)	Acute toxicity
Acute Tox.	4 (oral)	Acute toxicity

Skin Corr./Irrit.	2	Skin corrosion/irritation
Eye Dam./Irrit.	2A	Serious eye damage/eye irritation
STOT SE	3 (irritating to respiratory system)	Specific target organ toxicity — single exposure

Label elements

Pictogram:

Signal Word:
Warning

Hazard Statement:

H319	Causes serious eye irritation.
H315	Causes skin irritation.
H335	May cause respiratory irritation.
H302 + H332	Harmful if swallowed or if inhaled

Precautionary Statements (Prevention):

P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves and eye protection or face protection.
P261	Avoid breathing dust.
P261	Avoid breathing dust or fume.
P270	Do not eat, drink or smoke when using this product.
P264	Wash contaminated body parts thoroughly after handling.

Precautionary Statements (Response):

P312	Call a POISON CENTER or physician if you feel unwell.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P304 + P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P330	Rinse mouth
P332 + P313	If skin irritation occurs: Get medical attention.
P337 + P313	If eye irritation persists: Get medical attention.
P362 + P364	Take off contaminated clothing and wash it before reuse.

Precautionary Statements (Storage):

P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.

Precautionary Statements (Disposal):

P501	Dispose of contents/container in accordance with local regulations.

Hazards not otherwise classified

No specific dangers known, if the regulations/notes for storage and handling are considered.

3. Composition / Information on Ingredients

According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

caprolactam
CAS Number: 105-60-2
Content (W/W): >= 100.0 - <= 100.0%
Synonym: Hexahydro-2H-azepin-2-one; ε-Carprolactam

4. First-Aid Measures

Description of first aid measures

General advice:
Immediately remove contaminated clothing. Avoid contact with the skin, eyes and clothing.

If inhaled:
Remove the affected individual into fresh air and keep the person calm. Assist in breathing if necessary. Seek medical attention.

If on skin:
Wash thoroughly with soap and water Burns caused by molten material require hospital treatment.

If in eyes:
Hold eyes open and rinse slowly and gently with water for 15 to 20 minutes. Remove contact lenses, if present, after first 5 minutes, then continue rinsing. Seek medical attention.

If swallowed:
Immediately rinse mouth and then drink 200-300 ml of water, seek medical attention.

Most important symptoms and effects, both acute and delayed

Symptoms: Information, i.e. additional information on symptoms and effects may be included in the GHS labeling phrases available in Section 2 and in the Toxicological assessments available in Section 11.

Information on: caprolactam
Symptoms: Overexposure may cause:, headache, tachycardia, hypertension, hypotension (low blood pressure), fever, anorexia, epigastric distress, nausea, convulsions
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Indication of any immediate medical attention and special treatment needed

Note to physician
Treatment: Treat according to symptoms (decontamination, vital functions), no known specific antidote.

5. Fire-Fighting Measures

Extinguishing media

Suitable extinguishing media:
foam, carbon dioxide, water spray

Special hazards arising from the substance or mixture

Hazards during fire-fighting:
hydrogen cyanide, nitrogen oxides
The substances/groups of substances mentioned can be released in case of fire.

Advice for fire-fighters

Protective equipment for fire-fighting:
Firefighters should be equipped with self-contained breathing apparatus and turn-out gear.

Further information:
Collect contaminated extinguishing water separately, do not allow to reach sewage or effluent systems.

Impact Sensitivity:
Remarks: Substance/product is not impact sensitve at room temperature.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Ensure adequate ventilation. Avoid contact with skin and eyes. Use breathing apparatus if exposed to vapours/dust/aerosol. Information regarding personal protective measures, see section 8.

Environmental precautions

Do not empty into drains. Retain and dispose of contaminated wash water.

Methods and material for containment and cleaning up

For large amounts: Allow to solidify and sweep/shovel up.
For residues: Rinse away with water.

7. Handling and Storage

Precautions for safe handling

Ensure thorough ventilation of stores and work areas. During transportation in silo trucks the product is covered with nitrogen, do not climb in. Avoid contact with skin and eyes. Wear suitable protective clothing and eye/face protection. Handle in accordance with good industrial hygiene and safety practice.

Protection against fire and explosion:
Vapours may form explosive mixture with air. Take precautionary measures against static discharges.

Conditions for safe storage, including any incompatibilities

Segregate from acids and bases. Segregate from oxidants.

Suitable materials for containers: Stainless steel 1.4301 (V2), Aluminium, Stainless steel 1.4401

Further information on storage conditions: Keep under nitrogen.

Storage stability:
Storage temperature: 75 - 90 °C
The stated storage temperature should be noted.

8. Exposure Controls/Personal Protection

Components with occupational exposure limits

caprolactam	ACGIH, US:	TWA value 5 mg/m3 Inhalable fraction and vapor ;

Personal protective equipment

Respiratory protection**:**
Observe OSHA regulations for respirator use (29 CFR 1910.134). Wear a NIOSH-certified (or equivalent) respirator as necessary.

Hand protection**:**
Wear chemical resistant protective gloves., Consult with glove manufacturer for testing data.

Eye protection:
Tightly fitting safety goggles (chemical goggles).

Body protection:
Body protection must be chosen depending on activity and possible exposure, e.g. head protection, apron, protective boots, chemical-protection suit.

General safety and hygiene measures:
Handle in accordance with good industrial hygiene and safety practice. Take off immediately all contaminated clothing. At the end of the shift the skin should be cleaned and skin-care agents applied.

9. Physical and Chemical Properties

Form:	melt	
Odour:	faint specific odour	
Odour threshold:	No data available.	
Colour:	colourless	
pH value:	7 - 8.5 (333 g/l, 20 °C)	
solidification temperature:	69.3 °C	
Melting point:	69.00 °C	
Freezing point:	No data available.	
boiling temperature:	270.8 °C (1,013 mbar)	
Boiling point:	No data available.	
Boiling range:	No data available.	
Sublimation point:	No applicable information available.	
Flash point:	141.5 °C	(ISO 2719, closed cup)

Flammability:	not highly flammable	(UN Test N.1 (ready combustible solids))
Lower explosion limit:	(130.5 °C) The lower explosion point of the substance/mixture has been determined. The explosion point describes the temperature of a flammable liquid at which the concentration of the saturated vapour mixed with air equals the lower explosion limit.	(DIN EN 15794)
Upper explosion limit:	For solids not relevant for classification and labelling.	
Autoignition:	395 °C	(DIN 51794)
Vapour pressure:	0.0013 hPa (20 °C) 0.089 hPa (60 °C)	
Density:	1.014 g/cm3 (80 °C)	
Relative density:	1.105 (20 °C)	(OECD Guideline 109)
Vapour density:	No data available.	
Partitioning coefficient n-octanol/water (log Pow):	0.12 (25 °C)	(OECD Guideline 107)
Self-ignition temperature:	The value has not be determined because of the low risk of self-ignition in consequence of the low melting point. Based on its structural properties the product is not classified as self-igniting.	
Thermal decomposition:	No decomposition if correctly stored and handled.	
Viscosity, dynamic:	8.52 mPa.s (80 °C)	
Viscosity, kinematic:	Study scientifically not justified.	
Solubility in water:	4,650 g/l (20 °C) Literature data.	
Molar mass:	113.16 g/mol	
Evaporation rate:	No data available.	

10. Stability and Reactivity

Reactivity
No hazardous reactions if stored and handled as prescribed/indicated.

Corrosion to metals:
No corrosive effect on metal.

Oxidizing properties:
Based on its structural properties the product is not classified as oxidizing.

Reactions with water/air:	Which flammable gases:	Incomplete combustion results in formation of toxic gases, containing mainly carbon monoxide and carbon dioxide.
	Which toxic gases:	nitrogen oxides
	Which Peroxides:	
Formation of flammable gases:	Remarks:	Forms no flammable gases in the presence of water.

Chemical stability
The product is stable if stored and handled as prescribed/indicated.

Possibility of hazardous reactions
Reacts with oxidizing agents. Polymerization coupled with heat formation.

Conditions to avoid
Temperature: > 100 degrees Celsius
Avoid all sources of ignition: heat, sparks, open flame. Avoid formation of polymers in valves and pipes.

Incompatible materials
oxidizing agents

Hazardous decomposition products

Thermal decomposition:
No decomposition if correctly stored and handled.

11. Toxicological information

Primary routes of exposure

Routes of entry for solids and liquids are ingestion and inhalation, but may include eye or skin contact. Routes of entry for gases include inhalation and eye contact. Skin contact may be a route of entry for liquefied gases.

Acute Toxicity/Effects

Acute toxicity
Assessment of acute toxicity: Of moderate toxicity after single ingestion. Of moderate toxicity after short-term inhalation. Of low toxicity after short-term skin contact.

Oral
Type of value: LD50
Species: rat (female)
Value: 1,475 mg/kg (Directive 84/449/EEC, B.1)

Inhalation
Type of value: LC50
Species: rat (male/female)
Value: approx. 8.16 mg/l (BASF-Test)
Exposure time: 4 h
An aerosol with respirable particles was tested.

Dermal
Type of value: LD50
Species: rat (male/female)
Value: > 2,000 mg/kg (Directive 92/69/EEC, B.3)

Irritation / corrosion
Assessment of irritating effects: May cause slight irritation to the skin. May cause slight irritation to the eyes.

Skin
Species: human
Result: Irritant.

Eye
Species: human
Result: Irritant.

Sensitization
Assessment of sensitization: Skin sensitizing effects were not observed in animal studies.

modified Buehler test
Species: guinea pig
Result: Non-sensitizing.
Method: OECD Guideline 406

Aspiration Hazard
No aspiration hazard expected.

Chronic Toxicity/Effects

Repeated dose toxicity
Assessment of repeated dose toxicity: After repeated exposure the prominent effect is local irritation. The substance may cause damage to the upper respiratory tract after repeated inhalation, as shown in animal studies.

Genetic toxicity
Assessment of mutagenicity: The substance was not mutagenic in bacteria. The substance was not mutagenic in mammalian cell culture. The substance was not mutagenic in studies with mammals. Results from a number of genotoxicity studies with microorganisms, mammalian cell culture and mammals are available. Taking into account all of the information, there is no indication that the substance is genotoxic.
Genetic toxicity in vitro: other HGPRT assay V79 cells:with and without metabolic activation negative other Unscheduled DNA synthesis without metabolic activation negative
Genetic toxicity in vivo: OECD Guideline 475 Cytogenetic assay mouse (male/female) gavage negative

Carcinogenicity
Assessment of carcinogenicity: In long-term animal studies in which the substance was given in high concentrations by feed, a carcinogenic effect was not observed.
Experimental/calculated data: OECD Guideline 451 rat (Fischer 344) (male/female) oral feed ca. 187.5 and 375 mg/kg bw
Result: negative
OECD Guideline 451 mouse (B6C3F1) (male/female) oral feed ca. 1071 and 2143 mg/kg bw
Result: negative

Reproductive toxicity
Assessment of reproduction toxicity: The results of animal studies gave no indication of a fertility impairing effect.

Reproduction
Experimental/calculated data: similar to OECD guideline 416 Fertility rat (Fischer 344) (male/female) oral feed
NOAEL Mat.: 500 mg/kg
NOAEL F1: approx. 100 mg/kg
NOAEL F2: 100 mg/kg

Teratogenicity
Assessment of teratogenicity: The substance did not cause malformations in animal studies; however, toxicity to development was observed at high doses that were toxic to the parental animals.

Development
OECD Guideline 414 rat (Fischer 344) (female) gavage 100, 500, 1000 mg/kg
NOAEL Mat.: 100 mg/kg
NOAEL Teratog.: 1,000 mg/kg
OECD Guideline 414 rabbit (New Zealand White) (female) gavage 50, 150, 250 mg/kg
NOAEL Mat.: 150 mg/kg
NOAEL Teratog.: > 250 mg/kg

Experiences in humans
The symptoms/diagnosis/findings mentioned can occur in higher concentrations.

Other Information
Based on our experience and the information available, no adverse health effects are expected if handled as recommended with suitable precautions for designated uses.

12. Ecological Information

Toxicity

Aquatic toxicity
Assessment of aquatic toxicity:
There is a high probability that the product is not acutely harmful to aquatic organisms. The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations.

Toxicity to fish
LC0 (96 h) 100 mg/l, Oryzias latipes (OECD Guideline 203, semistatic)

LC50 (96 h) 500 - 1,000 mg/l, Salmo gairdneri, syn. O. mykiss (OECD 203; ISO 7346; 84/449/EEC, C.1, static)

LC50 (96 h) 707.1 mg/l, Salmo gairdneri, syn. O. mykiss (OECD 203; ISO 7346; 84/449/EEC, C.1, static)

Aquatic invertebrates
EC50 (48 h) > 1,000 mg/l, Daphnia magna (OECD Guideline 202, part 1, static)

EC50 (48 h) > 500 mg/l, Daphnia magna (DIN 38412 Part 11, static)

EC50 (48 h) > 500 mg/l, Daphnia magna (DIN 38412 Part 11, static)

Aquatic plants
No observed effect concentration (72 h) 1,000 mg/l (growth rate), Pseudokirchneriella subcapitata (OECD Guideline 201, static)

EC50 (72 h) > 1,000 mg/l (growth rate), Selenastrum capricornutum (OECD Guideline 201, static)

EC50 (72 h) 427.5 mg/l (growth rate), Scenedesmus subspicatus (DIN 38412 Part 9, static)

EC50 (72 h) > 1,000 mg/l (biomass), Selenastrum capricornutum (OECD Guideline 201, static)

Chronic toxicity to fish
Study scientifically not justified.

Chronic toxicity to aquatic invertebrates
No observed effect concentration (21 d) 100 mg/l, Daphnia magna (OECD Guideline 211, semistatic)

Assessment of terrestrial toxicity
No data available.
Study scientifically not justified.

Microorganisms/Effect on activated sludge

Toxicity to microorganisms
other aquatic
bacterium/EC50 (17 h): 4,240 mg/l

Persistence and degradability

Assessment biodegradation and elimination (H2O)
Readily biodegradable (according to OECD criteria).

Elimination information

82 % BOD of the ThOD (14 d) (OECD 301C; ISO 9408; 92/69/EEC, C.4-F) (aerobic, activated sludge) Readily biodegradable (according to OECD criteria).

Assessment of stability in water
In contact with water the substance will hydrolyse slowly.

Information on Stability in Water (Hydrolysis)
$t_{1/2}$ > 1 a, (other, pH 7)

Bioaccumulative potential

Assessment bioaccumulation potential
Because of the n-octanol/water distribution coefficient (log Pow) accumulation in organisms is not to be expected.

Bioaccumulation potential
Because of the n-octanol/water distribution coefficient (log Pow) accumulation in organisms is not to be expected.

Mobility in soil

Assessment transport between environmental compartments
The substance will not evaporate into the atmosphere from the water surface.
Adsorption to solid soil phase is not expected.

Additional information

Sum parameter

Chemical oxygen demand (COD): 1,960 mg/g

Biochemical oxygen demand (BOD): 1,110 mg/g

Other ecotoxicological advice:
Do not release untreated into natural waters.

13. Disposal considerations

Waste disposal of substance**:**
Dispose of in accordance with national, state and local regulations.

Container disposal:
Uncleaned empties should be disposed of in the same manner as the contents.

14. Transport Information

Land transport
USDOT

Not classified as a dangerous good under transport regulations

Sea transport
IMDG

Not classified as a dangerous good under transport regulations

Air transport
IATA/ICAO

Not classified as a dangerous good under transport regulations

15. Regulatory Information

Federal Regulations

Registration status:
Chemical TSCA, US released / listed

EPCRA 311/312 (Hazard categories): Refer to SDS section 2 for GHS hazard classes applicable for this product.

State regulations

State RTK	CAS Number	Chemical name
PA	105-60-2	caprolactam
NJ	105-60-2	caprolactam

NFPA Hazard codes:
Health: 2 Fire: 1 Reactivity: 0 Special:

16. Other Information

SDS Prepared by:
BASF NA Product Regulations
SDS Prepared on: 2022/09/10

We support worldwide Responsible Care® initiatives. We value the health and safety of our employees, customers, suppliers and neighbors, and the protection of the environment. Our commitment to Responsible Care is integral to conducting our business and operating our facilities in a safe and environmentally responsible fashion, supporting our customers and suppliers in ensuring the safe and environmentally sound handling of our products, and minimizing the impact of our operations on society and the environment during production, storage, transport, use and disposal of our products.