

# Safety data sheet

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BASF Safety data sheet according to UN GHS 4th rev.

Date / Revised: 16.12.2022

Version: 2.1

Product: **Caprolactam extract**

(ID no. 30043509/SDS\_GEN\_00/EN)

Date of print 12.10.2025

## 1. Identification

### Product identifier

## Caprolactam extract

Chemical name: Caprolactam solution

CAS Number: 105-60-2

### Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses: Chemical

Recommended use: for the production of homopolymerisates and copolymerisates, initial product for chemical syntheses

### Details of the supplier of the safety data sheet

#### Company:

BASF SE

67056 Ludwigshafen

GERMANY

Division Monomers

Telephone: +49 621 60 42737

E-mail address: pss.monomers@basf.com

### Emergency telephone number

International emergency number:

Telephone: +49 180 2273-112

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## 2. Hazards Identification

### Classification of the substance or mixture

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According to UN GHS criteria

Acute Tox. 4 (Inhalation - dust)  
Acute Tox. 4 (oral)  
Skin Corr./Irrit. 2  
Eye Dam./Irrit. 2A  
STOT SE 3 (irritating to respiratory system)

For the classifications not written out in full in this section the full text can be found in section 16.

**Label elements**Globally Harmonized System (GHS)

Pictogram:



Signal Word:

Warning

Hazard Statement:

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

Precautionary Statements (Prevention):

P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves.
P280	Wear eye and face protection.
P260	Do not breathe dust.
P260	Do not breathe dust/gas/mist/vapours.
P264	Wash contaminated body parts thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.

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.
P303 + P362	IF ON SKIN (or hair): Wash with plenty of soap and water.
P301 + P330	IF SWALLOWED: rinse mouth.
P332 + P313	If skin irritation occurs: Get medical attention.
P337 + P311	If eye irritation persists: Call a POISON CENTER or physician.
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.

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Precautionary Statements (Disposal):

P501

Dispose of contents and container to hazardous or special waste collection point.

### Other hazards

According to UN GHS criteria

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

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## 3. Composition/Information on Ingredients

### Substances

Chemical nature

Preparation based on:

caprolactam (Content (W/W): 60 % - 95 %)

CAS Number: 105-60-2

EC-Number: 203-313-2

INDEX-Number: 613-069-00-2

Water (Content (W/W): 5 % - 40 %)

CAS Number: 7732-18-5

EC-Number: 231-791-2

Hazardous ingredients (GHS)According to UN GHS criteria

caprolactam

CAS Number: 105-60-2

EC-Number: 203-313-2

INDEX-Number: 613-069-00-2

Acute Tox. 4 (Inhalation - dust)

Acute Tox. 4 (oral)

Skin Corr./Irrit. 2

Eye Dam./Irrit. 2A

STOT SE 3 (irr. to respiratory syst.)

H319, H315, H335, H302 + H332

For the classifications not written out in full in this section the full text can be found in section 16.

### Mixtures

Not applicable

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## 4. First-Aid Measures

### Description of first aid measures

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

If inhaled:

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Keep patient calm, remove to fresh air, seek medical attention.

On skin contact:

Wash thoroughly with soap and water

On contact with eyes:

Immediately wash affected eyes for at least 15 minutes under running water with eyelids held open, consult an eye specialist.

On ingestion:

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.

### **Indication of any immediate medical attention and special treatment needed**

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

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## **5. Fire-Fighting Measures**

### **Extinguishing media**

Suitable extinguishing media:  
foam, carbon dioxide, water spray

### **Special hazards arising from the substance or mixture**

Hydrogen cyanide, nitrogen oxides  
The substances/groups of substances mentioned can be released in case of fire.

### **Advice for fire-fighters**

Further information:

Product itself is non-combustible; fire extinguishing method of surrounding areas must be considered. Collect contaminated extinguishing water separately, do not allow to reach sewage or effluent systems.

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## **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: Pump off product.

For residues: Pick up with suitable absorbent material (e.g. sand, sawdust, general-purpose binder, kieselguhr). Rinse away with water.

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## 7. Handling and Storage

### Precautions for safe handling

Ensure thorough ventilation of stores and work areas. 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:

No special precautions necessary.

### Conditions for safe storage, including any incompatibilities

Segregate from acids and bases. Segregate from oxidants.

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

### Specific end use(s)

See exposure scenario(s) in the attachment to this safety data sheet.

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## 8. Exposure Controls/Personal Protection

### Control parameters

Components with occupational exposure limits

105-60-2: caprolactam

### Exposure controls

Personal protective equipment

Respiratory protection:

Respiratory protection in case of vapour/aerosol release. Gas filter for gases/vapours of organic compounds (boiling point >65 °C, e. g. EN 14387 Type A)

Hand protection:

Chemical resistant protective gloves (EN ISO 374-1)

Suitable materials also with prolonged, direct contact (Recommended: Protective index 6, corresponding > 480 minutes of permeation time according to EN ISO 374-1):

butyl rubber (butyl) - 0.7 mm coating thickness

nitrile rubber (NBR) - 0.4 mm coating thickness

Manufacturer's directions for use should be observed because of great diversity of types.

Eye protection:

Tightly fitting safety goggles (splash goggles) (e.g. EN 166)

Body protection:

Body protection must be chosen depending on activity and possible exposure, e.g. apron, protecting boots, chemical-protection suit (according to EN 14605 in case of splashes or EN ISO 13982 in case of dust).

General safety and hygiene measures

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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

### Information on basic physical and chemical properties

Form:	solution	
Colour:	slightly yellow	
Odour:	faint specific odour	
Odour threshold:	No data available.	
pH value:	8	(pH Meter)
solidification temperature:	14,5 °C	(other)
	(80 %(m))	
	41,4 °C	
	(90 %(m))	

#### Information on: Water

Boiling point: 100 °C

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Sublimation point:

No applicable information available.

Flash point:

not applicable

Evaporation rate:

Value can be approximated from Henry's Law Constant or vapor pressure.

Flammability:

not highly flammable

Lower explosion limit:

not applicable

Upper explosion limit:

not applicable

Ignition temperature:

not applicable

#### Information on: caprolactam

Vapour pressure: 0,0013 hPa  
(20 °C)  
Literature data.  
0,089 hPa  
(60 °C)  
Literature data.

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Density:

1 g/cm<sup>3</sup>  
(20 °C)

(OECD Guideline 109)

Relative density:

No data available.

Relative vapour density (air):

No data available.

Solubility in water:

No data available.  
miscible

#### Information on: caprolactam

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Partitioning coefficient *n*-octanol/water (log *K*<sub>ow</sub>): 0,12  
(25 °C)

(OECD Guideline 107)

Self ignition: Based on its structural properties the product is not classified as self-igniting. Test type: Spontaneous self-ignition at room-temperature.

Thermal decomposition: No decomposition if correctly stored and handled.

Viscosity, dynamic: No data available.

Viscosity, kinematic: No data available.

Explosion hazard: Based on the chemical structure there is no indication of explosive properties.

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

### Other information

Self heating ability: It is not a substance capable of spontaneous heating.

pK<sub>A</sub>: The substance does not dissociate.

Surface tension: Based on chemical structure, surface activity is not to be expected.

Grain size distribution: The substance / product is marketed or used in a non solid or granular form.

Molar mass: 113,16 g/mol

## 10. Stability and Reactivity

### Reactivity

Corrosion to metals: No corrosive effect on metal.

### 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 °C

Avoid all sources of ignition: heat, sparks, open flame. Avoid formation of polymers in valves and pipes.

### Incompatible materials

Substances to avoid:

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oxidizing agents

**Hazardous decomposition products**

Thermal decomposition products:

No hazardous decomposition products if stored and handled as prescribed/indicated., Incomplete combustion results in formation of toxic gases, containing mainly carbon monoxide and carbon dioxide.

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**11. Toxicological Information****Information on toxicological effects**Acute toxicity*Information on: caprolactam**Assessment of acute toxicity:*

*Of moderate toxicity after short-term inhalation. Of moderate toxicity after single ingestion. Virtually nontoxic after a single skin contact.*

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*Information on: caprolactam**Experimental/calculated data:*

*LD50 rat (oral): 1.475 mg/kg (Directive 84/449/EEC, B.1)*

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*Information on: caprolactam**Experimental/calculated data:*

*LC50 rat (by inhalation): approx. 8,16 mg/l 4 h (BASF-Test)*

*An aerosol with respirable particles was tested.*

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*Information on: caprolactam**Experimental/calculated data:*

*LD50 rat (dermal): > 2.000 mg/kg (Directive 92/69/EEC, B.3)*

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Irritation*Information on: caprolactam**Assessment of irritating effects:*

*Eye contact causes irritation. Skin contact causes irritation.*

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Respiratory/Skin sensitization*Information on: caprolactam**Assessment of sensitization:*

*Skin sensitizing effects were not observed in animal studies.*

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*Information on: caprolactam**Experimental/calculated data:*



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*modified Buehler test guinea pig: Non-sensitizing. (OECD Guideline 406)*  
-----Germ cell mutagenicity*Information on: caprolactam**Assessment of mutagenicity:**Most of the results from the available studies show no evidence of a mutagenic effect.*  
-----Carcinogenicity*Information on: caprolactam**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.*  
-----Reproductive toxicity*Information on: caprolactam**Assessment of reproduction toxicity:**The results of animal studies gave no indication of a fertility impairing effect.*  
-----Developmental toxicity*Information on: caprolactam**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.*  
-----Experiences in humans*Information on: caprolactam**Experimental/calculated data:**local skin irritation, irritation of the mucous membranes:**The symptoms/diagnosis/findings mentioned can occur in higher concentrations.*  
-----Specific target organ toxicity (single exposure)*Assessment of STOT single:**Causes temporary irritation of the respiratory tract.*Repeated dose toxicity and Specific target organ toxicity (repeated exposure)*Information on: caprolactam**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.*  
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Aspiration hazard

No aspiration hazard expected.

Other relevant toxicity information*Information on: caprolactam**Based on our experience and the information available, no adverse health effects are expected if handled as recommended with suitable precautions for designated uses.*  
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## 12. Ecological Information

### Toxicity

*Information on: caprolactam**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.*  
-----*Information on: caprolactam**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)*  
-----*Information on: caprolactam**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)*  
-----*Information on: caprolactam**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)*  
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*Information on: caprolactam**Microorganisms/Effect on activated sludge:**EC50 (17 h) 4.240 mg/l, Pseudomonas putida (other, aquatic)*  
-----*Information on: caprolactam**Chronic toxicity to fish:**Study scientifically not justified.*  
-----*Information on: caprolactam**Chronic toxicity to aquatic invertebrates:**No observed effect concentration (21 d) 100 mg/l, Daphnia magna (OECD Guideline 211, semistatic)*  
-----*Information on: caprolactam**Assessment of terrestrial toxicity:**No data available.*  
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## **Persistence and degradability**

*Information on: caprolactam**Assessment biodegradation and elimination (H<sub>2</sub>O):**Readily biodegradable (according to OECD criteria).*  
-----*Information on: caprolactam**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).*  
-----*Information on: caprolactam**Assessment of stability in water:**In contact with water the substance will hydrolyse slowly.*  
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## **Bioaccumulative potential**

*Information on: caprolactam**Bioaccumulation potential:**Because of the n-octanol/water distribution coefficient (log Pow) accumulation in organisms is not to be expected.*  
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## **Mobility in soil**

*Information on: caprolactam**Assessment transport between environmental compartments:**Volatility: The substance will not evaporate into the atmosphere from the water surface.**Adsorption in soil: Adsorption to solid soil phase is not expected.*  
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## **Other adverse effects**

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The substance is not listed in Regulation (EC) 1005/2009 on substances that deplete the ozone layer.

**Additional information**

Sum parameter

*Information on: caprolactam**Chemical oxygen demand (COD): 1.960 mg/g*  
-----*Information on: caprolactam**Biochemical oxygen demand (BOD): 1.110 mg/g*  
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Other ecotoxicological advice:

Do not release untreated into natural waters.

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**13. Disposal Considerations****Waste treatment methods**

Incinerate in suitable incineration plant, observing local authority regulations.

Contaminated packaging:

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

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**14. Transport Information****Land transport**

ADR

	Not classified as a dangerous good under transport regulations
UN number or ID number:	Not applicable
UN proper shipping name:	Not applicable
Transport hazard class(es):	Not applicable
Packing group:	Not applicable
Environmental hazards:	Not applicable
Special precautions for user	None known

RID

	Not classified as a dangerous good under transport regulations
UN number or ID number:	Not applicable
UN proper shipping name:	Not applicable
Transport hazard class(es):	Not applicable
Packing group:	Not applicable
Environmental hazards:	Not applicable
Special precautions for	None known

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user

**Inland waterway transport**

ADN

	Not classified as a dangerous good under transport regulations
UN number or ID number:	Not applicable
UN proper shipping name:	Not applicable
Transport hazard class(es):	Not applicable
Packing group:	Not applicable
Environmental hazards:	Not applicable
Special precautions for user:	None known

**Transport in inland waterway vessel**

	Not classified as a dangerous good under transport regulations
UN number or ID number:	Not applicable
UN proper shipping name:	Not applicable
Transport hazard class(es):	Not applicable
Packing group:	Not applicable
Environmental hazards:	Not applicable

**Sea transport**

IMDG

	Not classified as a dangerous good under transport regulations
UN number or ID number:	Not applicable
UN proper shipping name:	Not applicable
Transport hazard class(es):	Not applicable
Packing group:	Not applicable
Environmental hazards:	Not applicable
Special precautions for user:	None known

**Air transport**

IATA/ICAO

	Not classified as a dangerous good under transport regulations
UN number or ID number:	Not applicable
UN proper shipping name:	Not applicable
Transport hazard class(es):	Not applicable
Packing group:	Not applicable
Environmental hazards:	Not applicable
Special precautions for user:	None known

**Maritime transport in bulk according to IMO instruments**

Regulation:	IBC-Code
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Product name:	epsilon-Caprolactam (molten or aqueous solutions)
Pollution category:	Z
Ship Type:	3

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## 15. Regulatory Information

### **Safety, health and environmental regulations/legislation specific for the substance or mixture**

If other regulatory information applies that is not already provided elsewhere in this safety data sheet, then it is described in this subsection.

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## 16. Other Information

Full text of classifications, hazard symbols and hazard statements, if mentioned in section 2 or 3:

Acute Tox.	Acute toxicity
Skin Corr./Irrit.	Skin corrosion/irritation
Eye Dam./Irrit.	Serious eye damage/eye irritation
STOT SE	Specific target organ toxicity — single exposure
H319	Causes serious eye irritation.
H315	Causes skin irritation.
H335	May cause respiratory irritation.
H302 + H332	Harmful if swallowed or if inhaled

The data contained in this safety data sheet are based on our current knowledge and experience and describe the product only with regard to safety requirements. This safety data sheet is neither a Certificate of Analysis (CoA) nor technical data sheet and shall not be mistaken for a specification agreement. Identified uses in this safety data sheet do neither represent an agreement on the corresponding contractual quality of the substance/mixture nor a contractually designated use. It is the responsibility of the recipient of the product to ensure any proprietary rights and existing laws and legislation are observed.

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