

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

REACH registration No.	: 01-2119457029-36-0014
Chemical type	: Substance
Substance name	: ϵ -caprolactam
EC no	: 203-313-2
CAS No.	: 105-60-2
CAS name	: 2H-azepine-2-OH, hexahydro-
IUPAC name	: azepine-2-OH
Chemical name	: Cyclohexanone iso-oxime
Formula	: $C_6H_{11}NO$ or $CH_2(CH_2)_4CONH$

1.2. Relevant identified uses of the substance or mixture and uses advised against

1.2.1. Relevant identified uses

Use of the substance/preparation	: Intermediate monomer for polyamide, polymers, thermoplastics monomer for resins monomer for thermo-hardened resins plasticizer for polyamide leather tanning, finishing, impregnation coatings and paints
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1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Manufacturer:

Joint-Stock Company "KuibyshevAzot"
6, Novozavodskaya, Togliatti, Samara Region
445007 - Russia
T +7 (8482) 561101, 561301 - F +7 (8482) 561301
E-mail: office@kuazot.ru
<http://www.kuazot.ru/>

Only representative:

ITS Testing Services (UK) Ltd
Caleb Brett House
734 London Road
RM20 3NL - West Thurrock, Grays
Essex, United Kingdom
T +44(0)161 228 0111 - F +44(0)161 933 4001
E-mail: ies14.reach@intertek.com

1.4. Emergency telephone number

Emergency number : +44 (0) 161 245 8075

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Acute Tox. 4 H302
Acute Tox. 4 H332
Skin Irrit. 2 H315
Eye Irrit. 2 H319
STOT Single
Exp. 3 H335

Full text of H-phrases: see section 16.

Classification according to Directive 67/548/EEC or 1999/45/EC

Xn; R20/22
Xi; R36/37/38

Full text of R-phrases: see section 16.

Adverse physicochemical, human health and environmental effects

No additional information available

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according to Regulation (EC) No. 453/2010

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP)



GHS07

Signal word (CLP)

: Warning

Hazard statements (CLP)

: H302: Harmful if swallowed.

H332: Harmful if inhaled.

H315: Causes skin irritation.

H319: Causes serious eye irritation.

H335: May cause respiratory irritation.

Precautionary statements (CLP)

: P233 - Keep container tightly closed

P264 - Wash...thoroughly after handling

2.3. Other hazards

No additional information available

SECTION 3: Composition/information on ingredients

3.1. Substances

Name	Product identifier	%	Classification according to Directive 67/548/EEC
Caprolactam	(CAS No.) 105-60-2 (EC no) 203-313-2 (REACH-no) 01-2119457029-36-0014	>= 99,9	Xn; R20/22 Xi; R36/37/38
Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Caprolactam	(CAS No.) 105-60-2 (EC no) 203-313-2 (REACH-no) 01-2119457029-36-0014	>= 99,9	Acute Tox. 4 - H302 Acute Tox. 4 - H332 Skin Irrit. 2 - H315 Eye Irrit. 2 - H319 STOT Single Exp. 3 - H335

Full text of R-, H- and EUH-phrases: see section 16.

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

- First-aid measures after inhalation : Get medical advice immediately. Remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration.
- First-aid measures after skin contact : Get medical advice immediately. Immediately flush skin with soap and plenty of water for at least 15 minutes while removing contaminated clothing and shoes.
- First-aid measures after eye contact : Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical advice immediately.
- First-aid measures after ingestion : Do not induce vomiting. If victim is conscious and alert, give water to drink. Never give anything by mouth to unconscious person. Get medical advice immediately.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries after eye contact : Irritating to eyes.

4.3. Indication of any immediate medical attention and special treatment needed

No indications

SECTION 5: Firefighting measures

5.1. Extinguishing media

- Suitable extinguishing media: : Foam, Carbon Dioxide gas, fine sprayed water, water
- Unsuitable extinguishing media : combustible materials.

5.2. Special hazards arising from the substance or mixture

- Fire hazard : Hazardous decomposition products: Hydrogen Cyanide, Nitrogen oxides (NOx)
- Reactivity : Stable in use and storage conditions as recommended in item 7.

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according to Regulation (EC) No. 453/2010

5.3. Advice for firefighters

Precautionary measures fire

: Specific hazards: Hydrogen Cyanide, Nitrogen Oxides. The mentioned substances / groups of substances can be released in case of fire. Additional Information: separate collection of contaminated water used for firefighting; it is not allowed to mix it with sewage or effluent systems waters..

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures

: Avoid contact with skin, eyes and clothing. Use personal protective equipment as required. For further information refer to section 8 : Exposure-controls/personal protection"".

6.1.1. For non-emergency personnel

No additional information available

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

Do not allow to enter sewers, surface or ground water.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up

: Ensure adequate ventilation. Clean up promptly the affected area by sweeping or vacuuming. Package all material into industrial containers or waste for disposal.

Other information

: Avoid generation of dust. Keep away from sources of ignition.

6.4. Reference to other sections

Refer to sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling

: Provide adequate ventilation. Provide local exhaust or general room ventilation to minimize vapour concentrations. Avoid contact with skin, eye and clothing. Avoid generation of dust. Avoid ignition sources. Protect from moisture. Keep away from incompatible substances.

Hygiene measures

: Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling. Wash contaminated clothing prior to re-use. Remove all contaminated clothing and footwear.

7.2. Conditions for safe storage, including any incompatibilities

Storage condition(s)

: Keep in original containers. Keep container tightly closed in a cool, well-ventilated place. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Avoid high temperatures. Keep away from : combustible materials. reducing materials.

Incompatible products

: oxidizers

Incompatible materials

: oxygen

Packaging materials

: stainless steel. synthetic material.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupation exposure limits: no data available.

Biological exposure limits: no data available

DNEL/PNEC

DNEL/DMEL			Exposure routs	Exposure frequency	Critical component	Remark
Worker		Consumer				
Industry	Professional					
N/A	N/A	N/A	Oral	Short term (acute)	N/A	None
N/A	N/A	N/A		Long term (repeated)		
N/A	N/A	N/A	Dermal	Short term (acute)		
N/A	N/A	N/A		Long term (repeated)		
N/A	N/A	N/A	Inhalation	Short term (acute)		
5 mg/m³	5 mg/m³	2.5 mg/m³		Long term (repeated)		

PNEC aqua (freshwater): 1 mg/L

PNEC aqua (marine water): 1 mg/L

PNEC aqua (intermittent releases): 10 mg/L

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PNEC for sewage treatment plant: 50 mg/L

PNEC sediment: not available

PNEC soil: not available

PNEC oral (secondary poisoning): No potential for bioaccumulation

8.2. Exposure controls

Appropriate engineering controls	: Plenum-exhaust ventilation in production area. Production equipment must be tightly closed. Control caprolactam concentration in workplace air.
Hand protection	: protective gloves.
Eye protection	: Protective glasses.
Skin and body protection	: Wear appropriate protective clothing.
Respiratory protection	: In case of short-term exposure or low pollution, use respiratory filter devices. In case of intensive or longer exposure use self-contained respiratory devices.
Environmental exposure controls	: Can be disposed according to local regulation.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Solid
Appearance	: Crystals
Colour	: White
Odour	: Odourless.
Odour threshold	: No data available
pH	: 6.7-7.3 for 20% water solution
Melting point	: 69.3 °C
Solidification point	: 69.3 °C
Boiling point	: 270.8 °C at 1013.25 mbar
Flash point	: None
Relat. evapor. rate comp. to butylacetate	: No data available
Flammability (solid, gas)	: Non-flammable.
Explosive limits	: Non-explosive
Vapour pressure	: 0.0013 mbar at 20 °C
Relative vapour density at 20 °C	: No data available
Relative density	: 1.105 g/cm ³
Solubility	: Water solution 866.89 g/l at 22 °C
Log Pow	: 0.12 at 23 °C
Self ignition temperature	: None
Decomposition temperature	: No data available
Viscosity, kinematic	: None
Viscosity, dynamic	: None
Explosive properties	: Non explosive.
Oxidising properties	: Not oxidizer
Remarks	: No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

Stable in use and storage conditions as recommended in item 7.

10.2. Chemical stability

Stable in use and storage conditions as recommended in item 7.

10.3. Possibility of hazardous reactions

No additional information available

10.4. Conditions to avoid

No conditions to avoid

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10.5. Incompatible materials

Strong acids, oxidizers, alkalis

10.6. Hazardous decomposition products

No hazardous decomposition products known.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

Caprolactam (105-60-2)	
LD50 oral rat	1475 mg/kg bw (male), 1876 mg/kg bw (female)
LD50 dermal rat	> 2000 mg/kg bw
LC50 inhalation rat (mg/l)	> 8.16 mg/l air (male/female), 4 hrs

Skin corrosion/irritation : May be absorbed through the skin in harmful amounts.

Serious eye damage/irritation : Causes eye irritation.

Skin sensitisation : Sensitization is possible through skin contact.

Respiratory sensitisation : absorbed rapidly after single inhalation

Germ cell mutagenicity : Negative

Carcinogenicity : No carcinogenic effect

Reproductive toxicity : Not classified

Specific target organ toxicity (single exposure) : Not classified

Specific target organ toxicity (repeated exposure) : Not classified

Caprolactam (105-60-2)	
NOAEL (oral, rat)	29 mg/kg bw/d
NOAEL (oral, rat, 52 weeks)	256 mg/kg bw/d (OECD 453)
NOAEL (inhalation, rat, vapour, 2 weeks)	> 185 mg/m ³ (OECD 412)

Aspiration hazard : Not classified

Remarks : Some tests have been run on read-across substances

SECTION 12: Ecological information

12.1. Toxicity

Caprolactam (105-60-2)	
LC50 fresh water invertebrata	1000 mg/l (48 hours)
EC50 fresh water algae	> 1000 mg/l (72 hours)
EC50 microorganisms	> 1000 mg/l (72 hours)
EC10/LC10 or NOEC for aquatic microorganisms	> 173 mg/l (17 hours)
Remarks	Some tests have been run on read-across substances

12.2. Persistence and degradability

Caprolactam (105-60-2)	
Persistence and degradability	Not applicable to inorganic substances.
Hydrolysis	readily biodegradable. Degradation per cent of test substance: 82% after 14 days of BOD (CITI, 1992)

12.3. Bioaccumulative potential

Caprolactam (105-60-2)	
Log Pow	< 3
Bioaccumulative potential	Low bioaccumulation potential.

12.4. Mobility in soil

Caprolactam (105-60-2)	
Ecology - soil	low potential for adsorption to soil

12.5. Results of PBT and vPvB assessment

Caprolactam (105-60-2)	
Results of PBT assessment	According to Annex XIII of Regulation (EC) No 1907/2006, no PBT and vPvB assessment has been conducted.

12.6. Other adverse effects

No additional information available

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according to Regulation (EC) No. 453/2010

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods

: Can be sent for treatment or other appropriate means of disposal provided they meet the requirements of local laws.

Additional information

: Empty containers should be thoroughly rinsed with large quantities of clean water. Empty containers can be dumped after cleaning according to local legislation.

SECTION 14: Transport information

Not a hazardous commodity in sense of transport regulations.

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

15.1.1. EU-Regulations

No additional information available

15.1.2. National regulations

No additional information available

15.2. Chemical safety assessment

CSA has been carried out for this substance.

SECTION 16: Other information

Sources of Key data

: Chemical Safety Report

Abbreviations and acronyms

: ACGIH (American Conference of Government Industrial Hygienists). ASTM - American Society for Testing and Materials. CAS - Chemical Abstracts Service. CAS (Chemical Abstracts Service) number. CLP - Classification, Labelling and Packaging. CSR - Chemical Safety Report. DIN - Deutsches Institut für Normung eV (German Institute for Standardization). EC - European Community. EEC - European Economic Community. FRP: fiberglass-reinforced plastics. GESTIS: Gefahrstoffdaten banken (Database on hazardous substances). GHS - Globally Harmonised System. GPPS: general purpose polystyrenes. HCS - Hazard Communication Standard. HIPS: high impact polystyrenes. HMIS - Hazardous Materials Identification System. IARC (International Agency for Research on Cancer). MSDS - Material Safety Data Sheet. PVA (Polyvinyl alcohol). OSHA - Occupational Safety and Health Administration. Overland transport (ADR). PVC (Polyvinyl chloride). REACH - Registration, Evaluation, Authorisation and Restriction of Chemicals. SDS - Safety Data Sheet. UP: Unsaturated polyester. VCI - volatile corrosion inhibitor. VE: epoxy vinyl ester.

Full text of R-, H- and EUH-phrases:

H302	Harmful if swallowed.
H332	Harmful if inhaled.
H315	Causes skin irritation.
H319	Causes serious eye irritation
H335	May cause respiratory irritation.
R20/22	Harmful by inhalation and if swallowed
R36/37/38	Irritating to eyes, respiratory system and skin.

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.