



## SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

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

#### 1.1 Product identifier

Trade name : ε-Caprolactam  
Product code : C0203  
Index-No. : 613-069-00-2  
EC-No. : 203-313-2

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

Use of the Substance/Mixture : Use as laboratory reagent

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

Company : TCI EUROPE N.V.  
Address : Boereveldseweg 6 - Haven 1063, B-2070 Zwijndrecht, Belgium  
Telephone : +32 (0)3 735 07 00  
Telefax : +32 (0)3 735 07 01  
E-mail address of person responsible for the SDS : sales-eu@tcichemicals.com

#### 1.4 Emergency telephone number

Emergency telephone number : +44 844 892 0111

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### SECTION 2: Hazards identification

#### 2.1 Classification of the substance or mixture

##### Classification (REGULATION (EC) No 1272/2008)

Acute toxicity, Category 4	H302: Harmful if swallowed.
Acute toxicity, Category 4	H332: Harmful if inhaled.
Acute toxicity, Category 4	H312: Harmful in contact with skin.
Eye irritation, Category 2	H319: Causes serious eye irritation.
Specific target organ toxicity - single exposure, Category 1, Cardiovascular, Nervous system	H370: Causes damage to organs.
Specific target organ toxicity - single exposure, Category 3, Central nervous system	H336: May cause drowsiness or dizziness.
Specific target organ toxicity - single exposure, Category 3, Respiratory system	H335: May cause respiratory irritation.
Specific target organ toxicity - repeated exposure, Category 1, Respiratory system	H372: Causes damage to organs through prolonged or repeated exposure.

#### 2.2 Label elements

##### Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms :



Signal word : Danger

Hazard statements : H302 + H312 + H332 Harmful if swallowed, in contact with skin or if inhaled.  
H319 Causes serious eye irritation.  
H335 May cause respiratory irritation.  
H336 May cause drowsiness or dizziness.  
H370 Causes damage to organs (Cardiovascular, Nervous system).  
H372 Causes damage to organs (Respiratory system) through prolonged or repeated exposure.

Precautionary statements : **Prevention:**

P260 Do not breathe dust.  
P264 Wash skin thoroughly after handling.  
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.

**Response:**

P302 + P352 + P312 IF ON SKIN: Wash with plenty of water.  
Call a POISON CENTER/ doctor if you feel unwell.  
P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.  
P308 + P311 IF exposed or concerned: Call a POISON CENTER/ doctor.

### 2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Ecological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Toxicological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

## SECTION 3: Composition/information on ingredients

### 3.1 Substances

Substance name : ε-Caprolactam  
Index-No. : 613-069-00-2  
EC-No. : 203-313-2

#### Components

Chemical name	CAS RN EC-No.	Concentration (% w/w)	M-Factor, SCL, ATE
epsilon-Caprolactam	105-60-2 203-313-2	>= 90 - <= 100	

## SECTION 4: First aid measures

### 4.1 Description of first aid measures

If inhaled : Remove person to fresh air and keep comfortable for breathing.  
Call a POISON CENTER or doctor/ physician.

In case of skin contact : Take off all contaminated clothing immediately.  
Wash off with soap and plenty of water.  
Call a POISON CENTER or doctor/ physician.

In case of eye contact : Rinse with plenty of water.  
If easy to do, remove contact lens, if worn.  
Call a POISON CENTER or doctor/ physician.

If swallowed : Call a POISON CENTER or doctor/ physician.  
Rinse mouth.

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

None known.

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

None known.

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## SECTION 5: Firefighting measures

### 5.1 Extinguishing media

Suitable extinguishing media : Dry powder, Foam, Water spray, Carbon dioxide (CO<sub>2</sub>)

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

Specific hazards during fire-fighting : No information available.

### 5.3 Advice for firefighters

Special protective equipment for firefighters : Use personal protective equipment.

Specific extinguishing methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Immediately evacuate personnel to safe areas. Remove undamaged containers from fire area if it is safe to do so.

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## SECTION 6: Accidental release measures

### 6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Wear suitable protective equipment. Keep people away from and upwind of spill/leak. Entry to non-involved personnel should be controlled around the leakage area by roping off, etc.

### 6.2 Environmental precautions

Environmental precautions : Prevent product from entering drains.

### 6.3 Methods and material for containment and cleaning up

Methods for cleaning up : Pick up and arrange disposal without creating dust.

### 6.4 Reference to other sections

See sections: 7, 8, 11, 12 and 13.

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## SECTION 7: Handling and storage

### 7.1 Precautions for safe handling

Technical measures : Prevent dispersion of dust.

Local/Total ventilation : Ensure adequate ventilation.  
Handle product only in closed system or provide appropriate exhaust ventilation at machinery.  
Use a local exhaust ventilation.

Advice on safe handling : Avoid contact with skin, eyes and clothing.  
Wear personal protective equipment.  
Wash hands and face thoroughly after handling.

### 7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : Keep container tightly closed. Store in a cool and shaded area. Keep in a well-ventilated place. Protect from moisture. Keep under inert gas. Store locked up.

Storage class (TRGS 510) : 6.1C

### 7.3 Specific end use(s)

Specific use(s) : No information available.

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## SECTION 8: Exposure controls/personal protection

### 8.1 Control parameters

Occupational Exposure Limits

Components	CAS RN	Value type (Form of exposure)	Control parameters	Basis
epsilon-Caprolactam	105-60-2	TWA (Dust and vapour)	10 mg/m3	2000/39/EC
	Further information: Indicative			
		STEL (Dust and vapour)	40 mg/m3	2000/39/EC
	Further information: Indicative			
		AGW (Vapour and dust, inhalable fraction)	5 mg/m3	DE TRGS 900
	Peak-limit: excursion factor (category): 2;(I)			
	Further information: When there is compliance with the OEL and biological tolerance values, there is no risk of harming the unborn child			

## 8.2 Exposure controls

### Engineering measures

Install a closed system or local exhaust.  
Also install safety shower and eye bath.

### Personal protective equipment

Eye/face protection : Safety glasses, Safety goggles, Face-shield  
Hand protection : Impervious gloves  
Skin and body protection : Impervious protective clothing  
  
Respiratory protection : Dustproof gas mask  
Self-contained breathing apparatus

\*Use personal protective equipment(PPE) approved under appropriate government standards and follow local and national regulations.

## SECTION 9: Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

Physical state : Solid form  
Colour : white  
Odour : No data available  
Odour Threshold : No data available  
  
Melting point/freezing point : 70 °C  
Boiling point/boiling range : 267 °C  
Flammability : No data available  
Upper explosion limit / Upper flammability limit : 8 %(V)  
Lower explosion limit / Lower flammability limit : 1,4 %(V)  
Flash point : No data available  
Auto-ignition temperature : 375 °C  
Decomposition temperature : No data available  
pH : No data available  
Viscosity  
Viscosity, dynamic : No data available  
Viscosity, kinematic : No data available  
Solubility(ies)  
Water solubility : 5 250 g/l (25 °C)  
very soluble  
Solubility in other solvents : Solvent: Methanol  
very soluble  
  
Solvent: Ether  
very soluble  
  
Solvent: Ethanol  
very soluble  
  
Partition coefficient: n- : -0,19

octanol/water	
Vapour pressure	: 0,26 Pa (25 °C)
Relative density	: No data available
Relative vapour density	: 3,91
Particle characteristics	: No data available

**9.2 Other information**

Molecular weight	: 113,16 g/mol
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**SECTION 10: Stability and reactivity****10.1 Reactivity**

No data available

**10.2 Chemical stability**

Stable under normal conditions.

**10.3 Possibility of hazardous reactions**

Hazardous reactions	: None under normal processing.
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**10.4 Conditions to avoid**

Conditions to avoid	: Exposure to moisture,
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**10.5 Incompatible materials**

Materials to avoid	: Oxidizing agents, Strong bases,
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**10.6 Hazardous decomposition products**

Carbon monoxide, Carbon dioxide (CO<sub>2</sub>), Nitrogen oxides (NO<sub>x</sub>)

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**SECTION 11: Toxicological information****11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008****Acute toxicity****Product:**

Acute oral toxicity	: Assessment: The component/mixture is moderately toxic after single ingestion.
Acute inhalation toxicity	: Acute toxicity estimate: 1,52 mg/l Exposure time: 4 h Test atmosphere: dust/mist Method: Calculation method
Acute dermal toxicity	: Assessment: The component/mixture is moderately toxic after single contact with skin.

**Components:****epsilon-Caprolactam:**

Acute oral toxicity	: LD50 (Rat): 1 210 mg/kg Assessment: The component/mixture is moderately toxic after single ingestion.
Acute inhalation toxicity	: LC50 (Rat): 300 mg/m <sup>3</sup> Exposure time: 2 h Test atmosphere: dust/mist Assessment: The substance or mixture has no acute inhalation toxicity
Acute dermal toxicity	: LD50 (Rabbit): 1 410 mg/kg Assessment: The component/mixture is moderately toxic after single contact with skin.

Acute toxicity (other routes of administration) : LD50 (Mouse): 650 mg/kg  
Application Route: Intraperitoneal injection

**Skin corrosion/irritation****Product:**

Result : Mild skin irritation

**Components:****epsilon-Caprolactam:**

Result : Mild skin irritation

**Serious eye damage/eye irritation****Product:**

Result : Eye irritation

**Components:****epsilon-Caprolactam:**

Result : Eye irritation

**Respiratory or skin sensitisation** : No information available.

**Germ cell mutagenicity** : No information available.

**Carcinogenicity** : No information available.

**Reproductive toxicity** : No information available.

**STOT - single exposure****Product:**

Assessment : May cause respiratory irritation., May cause drowsiness or dizziness.

Target Organs : Cardiovascular, Nervous system  
Assessment : Causes damage to organs.

**Components:****epsilon-Caprolactam:**

Assessment : May cause respiratory irritation., May cause drowsiness or dizziness.

Target Organs : Cardiovascular, Nervous system  
Assessment : Causes damage to organs.

**STOT - repeated exposure****Product:**

Target Organs : Respiratory system  
Assessment : Causes damage to organs through prolonged or repeated exposure.

**Components:****epsilon-Caprolactam:**

Target Organs : Respiratory system  
Assessment : Causes damage to organs through prolonged or repeated exposure.

**Repeated dose toxicity** : No information available.

**Aspiration hazard** : No information available.

**RTECS No.** : CM3675000 (epsilon-Caprolactam)

## 11.2 Information on other hazards

### Endocrine disrupting properties

#### Product:

Assessment : The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

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## SECTION 12: Ecological information

### 12.1 Toxicity

#### Components:

##### epsilon-Caprolactam:

Toxicity to fish : LC50 (Oryzias latipes (Japanese medaka)): > 100 mg/l  
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 1 000 mg/l  
Exposure time: 48 h

Toxicity to algae/aquatic plants : EC50 (Selenastrum capricornutum (green algae)): > 1 000 mg/l  
Exposure time: 72 h

### 12.2 Persistence and degradability

No data available

### 12.3 Bioaccumulative potential

#### Components:

##### epsilon-Caprolactam:

Partition coefficient: n-octanol/water : -0,19

### 12.4 Mobility in soil

#### Components:

##### epsilon-Caprolactam:

Distribution among environmental compartments : Koc: 57

### 12.5 Results of PBT and vPvB assessment

#### Product:

Assessment : This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

### 12.6 Endocrine disrupting properties

#### Product:

Assessment : The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

### 12.7 Other adverse effects

No data available

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## SECTION 13: Disposal considerations

### 13.1 Waste treatment methods

Product	:	Disposal in accordance with local and national regulations. Entrust disposal to a licensed waste disposal company.
Contaminated packaging	:	Disposal in accordance with local and national regulations. Before disposal of used container, remove contents completely.

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## SECTION 14: Transport information

### 14.1 UN number or ID number

ADR	:	Not regulated as a dangerous good
IMDG	:	Not regulated as a dangerous good
IATA	:	Not regulated as a dangerous good

### 14.2 UN proper shipping name

ADR	:	Not regulated as a dangerous good
IMDG	:	Not regulated as a dangerous good
IATA	:	Not regulated as a dangerous good

### 14.3 Transport hazard class(es)

ADR	:	Not regulated as a dangerous good
IMDG	:	Not regulated as a dangerous good
IATA	:	Not regulated as a dangerous good

### 14.4 Packing group

ADR	:	Not regulated as a dangerous good
IMDG	:	Not regulated as a dangerous good
IATA (Cargo)	:	Not regulated as a dangerous good
IATA (Passenger)	:	Not regulated as a dangerous good

### 14.5 Environmental hazards

Not regulated as a dangerous good

### 14.6 Special precautions for user

Remarks	:	Not classified as dangerous in the meaning of transport regulations.
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### 14.7 Maritime transport in bulk according to IMO instruments

Not applicable for product as supplied.

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## SECTION 15: Regulatory information

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

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII)	:	Conditions of restriction for the following entries should be considered: Number on list 75 If you intend to use this product as tattoo ink, please contact your vendor.
REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59).	:	Not applicable
Regulation (EC) No 1005/2009 on substances that deplete the ozone layer	:	Not applicable



Regulation (EC) No 850/2004 on persistent organic pollutants : Not applicable

Regulation (EC) No 649/2012 of the European Parliament and the Council concerning the export and import of dangerous chemicals : Not applicable

REACH - List of substances subject to authorisation (Annex XIV) : Not applicable

Water hazard class (Germany) : WGK 1 slightly hazardous to water  
Code Number: 221  
Classification according to AwSV, Annex 1 (4)

#### Other regulations:

The product is subject to the supply restrictions of the Ordinance on the Prohibition of Chemicals.

Take note of Law on the protection of mothers at work, in education and in studies (Maternity Protection Act - MuSchG).

Take note of Directive 94/33/EC on the protection of young people at work or stricter national regulations, where applicable.

#### The components of this product are reported in the following inventories:

CH BAGREG	: On the inventory, or in compliance with the inventory
TSCA	: All substances listed as active on the TSCA inventory
AICS	: On the inventory, or in compliance with the inventory
DSL	: All components of this product are on the Canadian DSL
ENCS	: On the inventory, or in compliance with the inventory
ISHL	: On the inventory, or in compliance with the inventory
KECI	: On the inventory, or in compliance with the inventory
PICCS	: On the inventory, or in compliance with the inventory
IECSC	: On the inventory, or in compliance with the inventory
NZIoC	: On the inventory, or in compliance with the inventory

#### 15.2 Chemical safety assessment

A Chemical Safety Assessment is not required for this substance.

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### SECTION 16: Other information

#### Full text of other abbreviations

2000/39/EC	: Europe. Commission Directive 2000/39/EC establishing a first list of indicative occupational exposure limit values
DE TRGS 900	: Germany. TRGS 900 - Occupational exposure limit values.
2000/39/EC / TWA	: Limit Value - eight hours
2000/39/EC / STEL	: Short term exposure limit
DE TRGS 900 / AGW	: Time Weighted Average

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of In-

dustrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Cooperation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - Substance of Very High Concern; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

#### Further information

This SDS was prepared sincerely based on the information obtained, however, any warranty shall not be given regarding the data contained and the assessment of hazards and toxicity. Prior to use, please investigate not only the hazards and toxicity information but also the laws and regulations of the organization, area and country where the products are to be used, which shall be given the first priority. The products are supposed to be used promptly after purchase in consideration of safety. Some new information or amendments may be added afterwards. If the products are to be used far behind the expected time of use or you have any questions, please feel free to contact us. The stated cautions are for normal handling only. In case of special handling operations, sufficient care should be taken, in addition to the safety measures suitable for the given situation. All chemical products should be treated with the recognition of "having unknown hazards and toxicity", which differ greatly depending on the conditions and handling when in use and/or the conditions and duration of storage. The products must be handled only by those who are familiar with specialized knowledge and have experience or under the guidance of those specialists throughout use from opening to storage and disposal. Safe usage conditions shall be set up on each user's own responsibility.

DE / 6N