

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Revision Date 04.11.2010

Version 5.7

1. Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

| | |
|---------------------------|--|
| Catalogue No. | 807477 |
| Product name | Propylamine for synthesis |
| REACH Registration Number | A registration number is not available for this substance as the substance or its use are exempted from registration according to Article 2 REACH Regulation (EC) No 1907/2006, the annual tonnage does not require a registration or the registration is envisaged for a later registration deadline. |

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

| | |
|-----------------|---|
| Identified uses | Chemical for synthesis For additional information on uses please refer to the Merck Chemicals portal (www.merck-chemicals.com). |
|-----------------|---|

1.3 Details of the supplier of the safety data sheet

| | |
|------------------------|---|
| Company | Merck KGaA * 64271 Darmstadt * Germany * Phone:+49 6151 72-0 |
| Responsible Department | LS-QHC * e-mail: prodsafe@merckgroup.com |

1.4 Emergency telephone number Please contact the regional company representation in your country.

2. Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Flammable liquid, Category 2, H225
Acute toxicity, Category 3, Inhalation, H331
Acute toxicity, Category 3, Dermal, H311
Acute toxicity, Category 4, Oral, H302
Skin corrosion, Category 1B, H314
Corrosive to metals, Category 1, H290

For the full text of the H-Statements mentioned in this Section, see Section 16.

Classification (67/548/EEC or 1999/45/EC)

F; R11
Xn; R20/21/22
C; R34

For the full text of the R-phrases mentioned in this Section, see Section 16.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms



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Signal word

Danger

Hazard statements

H225 Highly flammable liquid and vapour.
H302 Harmful if swallowed.
H311 Toxic in contact with skin.
H314 Causes severe skin burns and eye damage.
H331 Toxic if inhaled.
H290 May be corrosive to metals.

Precautionary statements

P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P330 + P331 IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P309 + P310 IF exposed or if you feel unwell: Immediately call a POISON CENTER or doctor/physician.
P403 + P235 Store in a well-ventilated place. Keep cool.

Reduced labelling (≤125 ml)

Hazard pictograms



Signal word

Danger

Hazard statements

H311 Toxic in contact with skin.
H314 Causes severe skin burns and eye damage.
H331 Toxic if inhaled.

Precautionary statements

P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P330 + P331 IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P309 + P310 IF exposed or if you feel unwell: Immediately call a POISON CENTER or doctor/physician.

CAS-No. 107-10-8

Labelling (67/548/EEC or 1999/45/EC)

| | | |
|--------------|-------------------|---|
| Symbol(s) | F C | Highly flammable Corrosive |
| R-phrases(s) | 11-20/21/22-34 | Highly flammable. Harmful by inhalation, in contact with skin and if swallowed. Causes burns. |
| S-phrases(s) | 16-26-36/37/39-45 | Keep away from sources of ignition - No smoking. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show the label) |

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EC-No. 203-462-3 where possible).

Reduced labelling (≤125 ml)

| | | |
|--------------|----------------|--|
| Symbol(s) | F | Highly flammable |
| | C | Corrosive |
| R-phrases(s) | 20/21/22-34 | Harmful by inhalation, in contact with skin and if swallowed. Causes burns. |
| S-phrases(s) | 26-36/37/39-45 | In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). |

2.3 Other hazards

None known.

3. Composition/information on ingredients

| | | |
|------------|---|--|
| Formula | CH ₃ CH ₂ CH ₂ NH ₂ | C ₃ H ₉ N (Hill) |
| CAS-No. | 107-10-8 | |
| EC-No. | 203-462-3 | |
| Molar mass | 59,11 g/mol | |

4. First aid measures

4.1 Description of first aid measures

After inhalation: fresh air. Call in physician.

After skin contact: wash off with plenty of water. Swab with polyethylene glycol 400. Immediately remove contaminated clothing. Call a physician immediately.

After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist.

After swallowing: make victim drink water (two glasses at most), avoid vomiting (risk of perforation). Call a physician immediately. Do not attempt to neutralise.

4.2 Most important symptoms and effects, both acute and delayed

Irritation and corrosion, Cough, Shortness of breath
Risk of corneal clouding.
Risk of blindness!

4.3 Indication of immediate medical attention and special treatment needed

No information available.

5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media

Carbon dioxide (CO₂), Foam, Dry powder

Unsuitable extinguishing media

For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture

Combustible material, Vapours are heavier than air and may spread along floors.

Forms explosive mixtures with air at ambient temperatures.

Pay attention to flashback.

Development of hazardous combustion gases or vapours possible in the event of fire.

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Fire may cause evolution of:
nitrogen oxides

5.3 Advice for firefighters

Special protective equipment for fire-fighters

Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

Further information

Cool closed containers exposed to fire with water spray. Suppress (knock down) gases/vapours/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Do not breathe vapours, aerosols. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.

Advice for emergency responders: Protective equipment see section 8.

6.2 Environmental precautions

Do not empty into drains. Risk of explosion.

6.3 Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills.

Observe possible material restrictions (see sections 7.2 and 10.5).

Take up with liquid-absorbent and neutralising material (e.g. Chemisorb® OH⁻, Merck Art. No. 101596). Dispose of properly. Clean up affected area.

6.4 Reference to other sections

Indications about waste treatment see section 13.

7. Handling and storage

7.1 Precautions for safe handling

Observe label precautions.

Advice on protection against fire and explosion

Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition.

Store at +15°C to +25°C.

7.3 Specific end uses

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

8. Exposure controls/personal protection

8.1 Control parameters

8.2 Exposure controls

Engineering measures

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Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

See section 7.1.

Individual protection measures

Protective clothing needs to be selected specifically for the workplace, depending on concentrations and quantities of the hazardous substances handled. The chemical resistance of the protective equipment should be enquired at the respective supplier.

Hygiene measures

Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

Eye/face protection

Tightly fitting safety goggles

Hand protection

splash contact:

| | |
|---------------------|-----------|
| Glove material: | Viton (R) |
| Glove thickness: | 0,70 mm |
| Break through time: | > 60 min |

The protective gloves to be used must comply with the specifications of EC Directive 89/686/EEC and the related standard EN374, for example KCL 890 Vitoject® (splash contact). The breakthrough times stated above were determined by KCL in laboratory tests acc. to EN374 with samples of the recommended glove types.

This recommendation applies only to the product stated in the safety data sheet(>,<) supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Other protective equipment:

protective clothing

Respiratory protection

required when vapours/aerosols are generated.

Recommended Filter type: Filter K (acc. to DIN 3181) for NH₃

The entrepreneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

Environmental exposure controls

Do not empty into drains.

Risk of explosion.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

| | |
|-----------------|---------------------------|
| Form | liquid |
| Colour | colourless |
| Odour | amine-like |
| Odour Threshold | No information available. |

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| | |
|--|---|
| pH | 12,6 at 100 g/l 20 °C |
| Melting point | -83 °C |
| Boiling point/boiling range | 48 - 50 °C |
| Flash point | -30 °C Method: DIN 51755 Part 1 |
| Evaporation rate | No information available. |
| Flammability (solid, gas) | No information available. |
| Lower explosion limit | 2,1 %(V) |
| Upper explosion limit | 13,6 %(V) |
| Vapour pressure | 330 hPa at 20 °C |
| Relative vapour density | No information available. |
| Relative density | 0,72 g/cm ³ at 20 °C |
| Water solubility | at 20 °C soluble |
| Partition coefficient: n-octanol/water | log Pow: 0,48 Method: (experimental) (Lit.) Bioaccumulation is not expected (log Pow <1). |
| Autoignition temperature | No information available. |
| Decomposition temperature | No information available. |
| Viscosity, dynamic | 0,39 mPa.s at 20 °C |
| Explosive properties | No information available. |
| Oxidizing properties | No information available. |

9.2 Other data

| | |
|----------------------|-----------------------------|
| Ignition temperature | 325 °C Method: DIN 51794 |
| Corrosion | May be corrosive to metals. |

10. Stability and reactivity

10.1 Reactivity

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Vapours may form explosive mixture with air.

10.2 Chemical stability

heat-sensitive
Sensitive to air.

10.3 Possibility of hazardous reactions

Exothermic reaction with:

acids

Risk of explosion with:

Strong oxidizing agents, Mercury

Violent reactions possible with:

Halogenated hydrocarbon, Alcohols, Aldehydes, Ketones, Nitriles, acid halides, phenols, anhydrides, Esters

Caution! In contact with nitrites, nitrates, nitrous acid possible liberation of nitosamines!

10.4 Conditions to avoid

Warming.

A range from approx. 15 Kelvin below the flash point is to be rated as critical.

10.5 Incompatible materials

Aluminium, Copper, Copper alloys, Zinc, Tin

10.6 Hazardous decomposition products

in the event of fire: See chapter 5.

11. Toxicological information

11.1 Information on toxicological effects

Acute oral toxicity

LD50 rat

Dose: 370 mg/kg

(RTECS)

Symptoms: If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the oesophagus and the stomach.

absorption

Acute inhalation toxicity

LC50 rat

Dose: 7,06 mg/l, 4 h

(External MSDS)

Symptoms: burns of mucous membranes, Cough, Shortness of breath, Inhalation may lead to the formation of oedemas in the respiratory tract.

absorption

Acute dermal toxicity

LD50 rabbit

Dose: 400 mg/kg

(RTECS)

absorption

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Skin irritation

rabbit

Result: Causes burns.
(External MSDS)

Causes burns.

Eye irritation

Causes eye burns. Risk of corneal clouding.

Risk of serious damage to eyes.

Risk of blindness!

Genotoxicity in vitro

Ames test

Result: negative
(External MSDS)

Specific target organ toxicity - single exposure

The substance or mixture is not classified as specific target organ toxicant, single exposure.

Specific target organ toxicity - repeated exposure

The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Aspiration hazard

No aspiration toxicity classification

11.2 Further information

Further information

Under given conditions, contact with nitrites or nitric acid can lead to the formation of nitrosamines, which have shown themselves to be carcinogenic in animal experiments.

Further data:

Other dangerous properties can not be excluded.

Handle in accordance with good industrial hygiene and safety practice.

12. Ecological information

12.1 Toxicity

Toxicity to fish

LC50

Species: Leuciscus idus (Golden orfe)

Dose: 46 mg/l

Exposure time: 96 h

(Hommel)

Toxicity to daphnia and other aquatic invertebrates.

EC50

Species: Daphnia magna (Water flea)

Dose: 70,7 mg/l

Exposure time: 48 h

(Hommel)

Toxicity to bacteria

EC50

Species: Bacteria

Dose: 46 mg/l

Exposure time: 17 h

(Hommel)

12.2 Persistence and degradability

Ratio BOD/COD

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> 60 %
(External MSDS)

12.3 Bioaccumulative potential

Partition coefficient: n-octanol/water

log Pow: 0,48

Method: (experimental)

(Lit.) Bioaccumulation is not expected (log Pow <1).

12.4 Mobility in soil

No information available.

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted.

12.6 Other adverse effects

Additional ecological information

Do not allow to run into surface waters, wastewater, or soil.

13. Disposal considerations

Waste treatment methods

See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

14. Transport information

ADR/RID

UN 1277 PROPYLAMINE, 3 (8), II

IATA

UN 1277 PROPYLAMINE, 3 (8), II

IMDG

UN 1277 PROPYLAMINE, 3 (8), II

EmS F-E S-C

The transport regulations are cited according to international regulations and in the form applicable in Germany. Possible national deviations in other countries are not considered.

15. Regulatory information

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

EU regulations

| | |
|-----------------------|---|
| Major Accident Hazard | 96/82/EC |
| Legislation | Highly flammable 7b Quantity 1: 5.000 t Quantity 2: 50.000 t |

| | |
|---------------------------|---|
| Occupational restrictions | Take note of Dir 94/33/EC on the protection of young people at work. Take note of Dir 92/85/EEC on the safety and health at work of pregnant workers. |
|---------------------------|---|

National legislation

| | |
|-------------------|---------------------|
| Storage class VCI | 3 Flammable Liquids |
|-------------------|---------------------|

15.2 Chemical Safety Assessment

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For this product a chemical safety assessment was not carried out.

16. Other information

Full text of H-Statements referred to under sections 2 and 3.

| | |
|------|--|
| H225 | Highly flammable liquid and vapour. |
| H290 | May be corrosive to metals. |
| H302 | Harmful if swallowed. |
| H311 | Toxic in contact with skin. |
| H314 | Causes severe skin burns and eye damage. |
| H331 | Toxic if inhaled. |

Full text of R-phrases referred to under sections 2 and 3

| | |
|-----------|---|
| R11 | Highly flammable. |
| R20/21/22 | Harmful by inhalation, in contact with skin and if swallowed. |
| R34 | Causes burns. |

Training advice

Provide adequate information, instruction and training for operators.

Regional representation: This information is given on the authorised Safety Data Sheet for your country.

Key or legend to abbreviations and acronyms used in the safety data sheet

Used abbreviations and acronyms can be looked up at www.wikipedia.org.

The information contained herein is based on the present state of our knowledge. It characterises the product with regard to the appropriate safety precautions. It does not represent a guarantee of any properties of the product.