SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

Revision Date 14.06.2011 Version 8.0

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

1.1 Product identifier

<table>
<thead>
<tr>
<th>Catalogue No.</th>
<th>805967</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product name</td>
<td>3-Mercaptopropionic acid for synthesis</td>
</tr>
<tr>
<td>REACH Registration Number</td>
<td>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.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Identified uses</th>
<th>Chemical for synthesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>For additional information on uses please refer to the Merck Chemicals portal (<a href="http://www.merck-chemicals.com">www.merck-chemicals.com</a>).</td>
<td></td>
</tr>
</tbody>
</table>

1.3 Details of the supplier of the safety data sheet

<table>
<thead>
<tr>
<th>Company</th>
<th>Merck KGaA * 64271 Darmstadt * Germany * Phone:+49 6151 72-0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responsible Department</td>
<td>EQ-RS * e-mail: <a href="mailto:prodsafe@merckgroup.com">prodsafe@merckgroup.com</a></td>
</tr>
</tbody>
</table>

1.4 Emergency telephone number

Please contact the regional company representation in your country.

SECTION 2. Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

- Acute toxicity, Category 3, Oral, H301
- Skin corrosion, Category 1B, H314

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

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

- T Toxic R25
- C Corrosive 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

Signal word
Danger
Hazard statements
H301 Toxic if swallowed.
H314 Causes severe skin burns and eye damage.

Precautionary statements
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P330 + P331 IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
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. 107-96-0

Labelling (67/548/EEC or 1999/45/EC)
Symbol(s) T Toxic
R-phrase(s) 25-34 Toxic if swallowed. Causes burns.
S-phrase(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).

EC-No. 203-537-0

2.3 Other hazards
None known.

SECTION 3. Composition/information on ingredients

<table>
<thead>
<tr>
<th>Formula</th>
<th>HSCH₂CH₂COOH</th>
<th>C₃H₆O₂S (Hill)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS-No.</td>
<td>107-96-0</td>
<td></td>
</tr>
<tr>
<td>EC-No.</td>
<td>203-537-0</td>
<td></td>
</tr>
<tr>
<td>Molar mass</td>
<td>106,14 g/mol</td>
<td></td>
</tr>
</tbody>
</table>

SECTION 4. First aid measures

4.1 Description of first aid measures
After inhalation: fresh air. Get medical attention.

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 an ophthalmologist.

If swallowed: give water to drink (two glasses at most). Seek medical advice immediately. In exceptional cases only, if medical care is not available within one hour, induce vomiting (only in persons who are wide awake and fully conscious), administer activated charcoal (20 - 40 g in a 10% slurry) and consult a doctor as quickly as possible. Do not attempt to neutralise.

4.2 Most important symptoms and effects, both acute and delayed
Irritation and corrosion, irritant effects, Cough, Shortness of breath
Risk of blindness!
4.3 Indication of any immediate medical attention and special treatment needed
No information available.

SECTION 5. Fire-fighting measures

5.1 Extinguishing media
Suitable extinguishing media
Water, 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 on intense heating.
Development of hazardous combustion gases or vapours possible in the event of fire.
Fire may cause evolution of:
Sulphur 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
Suppress (knock down) gases/vapours/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Avoid substance contact. Avoid inhalation of vapours/aerosols or dusts. 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.

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).
Depending on the state of matter, take up dry or with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

6.4 Reference to other sections
Indications about waste treatment see section 13.

SECTION 7. Handling and storage

7.1 Precautions for safe handling
Observe label precautions.

7.2 Conditions for safe storage, including any incompatibilities
Tightly closed. Keep in a well-ventilated place. Keep locked up or in an area accessible only to qualified or authorised persons.
SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

Catalogue No. 805967
Product name 3-Mercaptopropionic acid for synthesis

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.

SECTION 8. Exposure controls/personal protection

8.2 Exposure controls

Engineering measures
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. Work under hood. Do not inhale substance.

Eye/face protection
Tightly fitting safety goggles

Hand protection
full contact:
Glove material: butyl-rubber
Glove thickness: 0,7 mm
Break through time: > 480 min

splash contact:
Glove material: Nitrile rubber
Glove thickness: 0,40 mm
Break through time: > 120 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 898 Butoject® (full contact), KCL 730 Camatril® -Velours (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
Acid-resistant protective clothing

Respiratory protection
required when dusts/vapours/aerosols are generated.
Recommended Filter type: Filter B-(P2)
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
Environmental exposure controls
Do not empty into drains.

### SECTION 9. Physical and chemical properties

#### 9.1 Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form</td>
<td>liquid</td>
</tr>
<tr>
<td>Colour</td>
<td>colourless</td>
</tr>
<tr>
<td>Odour</td>
<td>rancid</td>
</tr>
<tr>
<td>Odour Threshold</td>
<td>No information available.</td>
</tr>
<tr>
<td>pH</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>at 120 g/l</td>
</tr>
<tr>
<td></td>
<td>at 20 °C</td>
</tr>
<tr>
<td>Melting point</td>
<td>17 - 19 °C</td>
</tr>
<tr>
<td>Boiling point/boiling range</td>
<td>110 °C</td>
</tr>
<tr>
<td></td>
<td>at 20 hPa</td>
</tr>
<tr>
<td>Flash point</td>
<td>93 °C</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No information available.</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>not applicable</td>
</tr>
<tr>
<td>Lower explosion limit</td>
<td>1,60 %(V)</td>
</tr>
<tr>
<td>Upper explosion limit</td>
<td>No information available.</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>0,053 hPa</td>
</tr>
<tr>
<td></td>
<td>at 20 °C</td>
</tr>
<tr>
<td>Relative vapour density</td>
<td>No information available.</td>
</tr>
<tr>
<td>Relative density</td>
<td>1,22 g/cm³</td>
</tr>
<tr>
<td></td>
<td>at 20 °C</td>
</tr>
<tr>
<td>Water solubility</td>
<td>soluble</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>log Pow: 0,43</td>
</tr>
<tr>
<td></td>
<td>(experimental)</td>
</tr>
<tr>
<td></td>
<td>(Lit.) Bioaccumulation is not expected.</td>
</tr>
<tr>
<td>Autoignition temperature</td>
<td>No information available.</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>No information available.</td>
</tr>
</tbody>
</table>
Viscosity, dynamic  No information available.
Explosive properties Not classified as explosive.
Oxidizing properties none

9.2 Other data
Ignition temperature 350 °C

SECTION 10. Stability and reactivity
10.1 Reactivity
Forms explosive mixtures with air on intense heating.

10.2 Chemical stability
The product is chemically stable under standard ambient conditions (room temperature).

10.3 Possibility of hazardous reactions
Violent reactions possible with:
Oxidizing agents, Reducing agents, alkalines

10.4 Conditions to avoid
Strong heating.
A range from approx. 15 Kelvin below the flash point is to be rated as critical.

10.5 Incompatible materials
no information available

10.6 Hazardous decomposition products
in the event of fire: See chapter 5.

SECTION 11. Toxicological information
11.1 Information on toxicological effects
Acute oral toxicity
LD50 rat: 96 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
Symptoms: mucosal irritations, Cough, Shortness of breath, Possible damages:, damage of respiratory tract
Skin irritation
Causes burns.
Eye irritation
Causes serious eye damage. Risk of blindness!

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
Based on available data the classification criteria are not met.

11.2 Further information
After absorption:
We have no description of any toxic symptoms.
Other information
The following applies to mercaptans in general: offensive odour.
Further data:
Other dangerous properties can not be excluded.
Handle in accordance with good industrial hygiene and safety practice.

SECTION 12. Ecological information

12.1 Toxicity
No information available.

12.2 Persistence and degradability
No information available.

12.3 Bioaccumulative potential
Partition coefficient: n-octanol/water
log Pow: 0.43
(experimental)
(Lit.) Bioaccumulation is not expected.

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
We have no quantitative data concerning the ecological effects of this product.
Further information on ecology
Discharge into the environment must be avoided.

SECTION 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.

SECTION 14. Transport information

ADR/RID
UN 2922 CORROSIVE LIQUID, TOXIC, N.O.S. (3-MERCAPTOPROPIONIC ACID), 8 (6.1), II

IATA
UN 2922 CORROSIVE LIQUID, TOXIC, N.O.S. (3-MERCAPTOPROPIONIC ACID), 8 (6.1), II

IMDG
UN 2922 CORROSIVE LIQUID, TOXIC, N.O.S. (3-MERCAPTOPROPIONIC ACID), 8 (6.1), II
EmS F-A S-B
Segregation Group: 0001 Acids
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.

SECTION 15. Regulatory information

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

EU regulations

Major Accident Hazard Legislation 96/82/EC
Toxic
2
Quantity 1: 50 t
Quantity 2: 200 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.

Storage class 6.1 C

15.2 Chemical Safety Assessment

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

SECTION 16. Other information

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

H301 Toxic if swallowed.
H314 Causes severe skin burns and eye damage.

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

R25 Toxic if swallowed.
R34 Causes burns.

Training advice
Provide adequate information, instruction and training for operators.

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.

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

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.