1. PRODUCT AND COMPANY IDENTIFICATION

Product name: 2-Mercaptoethanol
Product Number: M3148
Brand: Sigma
Company: Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA
Telephone: +18003255832
Fax: +18003255052
Emergency Phone #: (314) 776-6555

2. HAZARDS IDENTIFICATION

Emergency Overview

OSHA Hazards
Combustible Liquid, Toxic by inhalation, Toxic by ingestion, Highly toxic by skin absorption, Skin sensitiser, Corrosive, Mutagen

GHS Label elements, including precautionary statements

Signal word: Danger
Hazard statement(s)
H227 Combustible liquid
H301 Toxic if swallowed.
H310 + H330 Fatal in contact with skin or if inhaled.
H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P273 Avoid release to the environment.
P280 Wear protective gloves/eye protection/face protection.
P284 Wear respiratory protection.
P302 + P350 IF ON SKIN: Gently wash with plenty of soap and water.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310 Immediately call a POISON CENTER or doctor/physician.
P501 Dispose of contents/container to an approved waste disposal plant.

HMIS Classification
Health hazard: 3
Chronic Health Hazard: *
Flammability: 2
Physical hazards: 0

NFPA Rating
Health hazard: 3
Fire: 2
Reactivity Hazard: 0

Potential Health Effects

<table>
<thead>
<tr>
<th>Route</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation</td>
<td>Toxic if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.</td>
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<tr>
<td>Skin</td>
<td>Causes skin burns. May be fatal if absorbed through skin.</td>
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<td>Causes eye burns.</td>
</tr>
<tr>
<td>Ingestion</td>
<td>Toxic if swallowed. Causes burns.</td>
</tr>
</tbody>
</table>

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms: Thioethylene glycol
          2-Hydroxyethylmercaptan
          BME
          β-Mercaptoethanol

<table>
<thead>
<tr>
<th></th>
<th>Formula</th>
<th>Molecular Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C₂H₆OS</td>
<td>78.13 g/mol</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CAS-No.</th>
<th>EC-No.</th>
<th>Index-No.</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Mercaptoethanol</td>
<td>60-24-2</td>
<td>200-464-6</td>
<td>-</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Continue rinsing eyes during transport to hospital. Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Special protective equipment for fire-fighters
Wear self-contained breathing apparatus for fire fighting if necessary.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Wear respiratory protection. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.

Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

Methods and materials for containment and cleaning up
Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.
7. HANDLING AND STORAGE

Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

Conditions for safe storage
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Update</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Mercaptoethanol</td>
<td>60-24-2</td>
<td>TWA</td>
<td>0.2 ppm</td>
<td>2008-01-01</td>
<td>USA. Workplace Environmental Exposure Levels (WEEL)</td>
</tr>
<tr>
<td>Remarks</td>
<td>Skin</td>
<td></td>
<td></td>
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Personal protective equipment

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection
Handle with gloves.

Eye protection
Tightly fitting safety goggles. Faceshield (8-inch minimum).

Skin and body protection
Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Hygiene measures
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance
Form liquid
Colour colourless yellow
Odour Stench.

Safety data
pH 4.5 - 6 at 500 g/l at 20 °C (68 °F)
Melting point < -50 °C (< -58 °F)
Boiling point 157 °C (315 °F)
Flash point 68 °C (154 °F)
Ignition temperature 295 °C (563 °F) at 1,013 hPa (760 mmHg)
Lower explosion limit 2.3 %(V)
Upper explosion limit 18 %(V)
Vapour pressure 0.76 hPa (0.57 mmHg) at 20 °C (68 °F) 4.67 hPa (3.50 mmHg) at 40 °C (104 °F)
Density 1.114 g/mL at 25 °C (77 °F)
Water solubility soluble
Partition coefficient: log Pow: -0.326
n-octanol/water log Pow: -0.056 at 25 °C (77 °F)
Relative vapour density 2.70 - (Air = 1.0)

10. STABILITY AND REACTIVITY

Chemical stability
Stable under recommended storage conditions.

Conditions to avoid
no data available

Materials to avoid
Metals, Oxidizing agents

Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Sulphur oxides

11. TOXICOLOGICAL INFORMATION

Acute toxicity
LD50 Oral - rat - 244 mg/kg
LD50 Oral - rat - 98 - 162 mg/kg
LC50 Inhalation - rat - 4 h - 625 ppm
LD50 Dermal - rabbit - 168 - 200 mg/kg
LD50 Dermal - rabbit - 112 - 224 mg/kg

Skin corrosion/irritation
Skin - rabbit - Irritating to skin. - Draize Test

Serious eye damage/eye irritation
Eyes - rabbit - Risk of serious damage to eyes.

Respiratory or skin sensitization
Maximisation Test - guinea pig - OECD Test Guideline 406 - May cause sensitization by skin contact.

Germ cell mutagenicity
Experiments showed mutagenic effects in cultured bacterial cells.

Carcinogenicity
IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
no data available

Specific target organ toxicity - single exposure (GHS)
no data available
**Specific target organ toxicity - repeated exposure (GHS)**
no data available

**Aspiration hazard**
no data available

**Potential health effects**

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**Signs and Symptoms of Exposure**

burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea, Vomiting, Weakness, Unconsciousness, Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema

**Additional Information**

RTECS: KL5600000

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**12. ECOLOGICAL INFORMATION**

**Toxicity**

- **Toxicity to fish**
  LC50 - *Leuciscus idus* (Golden orfe) - 46 - 100 mg/l - 96.0 h

- **Toxicity to daphnia and other aquatic invertebrates.**
  EC50 - *Daphnia* - 1.52 mg/l - 48 h
  EC50 - *Daphnia* - 0.89 mg/l - 48 h
  Method: OECD Test Guideline 202

- **Toxicity to algae**
  EC50 - *Desmodesmus subspicatus* (green algae) - 12 mg/l - 72 h

- **Toxicity to bacteria**
  LC50 - *Bacteria* - 125 mg/l - 17 h

**Persistence and degradability**

- **Biodegradability**
  Result: < 30.0 % - Not readily biodegradable.
  Result: 6 % - Not readily biodegradable.
  aerobic
  Result: < 10 % - Not readily biodegradable.

**Bioaccumulative potential**

Does not accumulate in organisms.

**Mobility in soil**

no data available

**PBT and vPvB assessment**

no data available

**Other adverse effects**

- **Biochemical Oxygen Demand (BOD)**
  105 mg/g

- **Chemical Oxygen Demand (COD)**
  1.894 mg/g

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

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**13. DISPOSAL CONSIDERATIONS**
Product
This combustible material may be burned in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN-Number: 2966  Class: 6.1  Packing group: II
Proper shipping name: Thioglycol
Marine pollutant: No
Poison Inhalation Hazard: No

IMDG
UN-Number: 2966  Class: 6.1  Packing group: II  EMS-No: F-A, S-A
Proper shipping name: THIOGLYCOL
Marine pollutant: No

IATA
UN-Number: 2966  Class: 6.1  Packing group: II
Proper shipping name: Thioglycol

15. REGULATORY INFORMATION

OSHA Hazards
Combustible Liquid, Toxic by inhalation., Toxic by ingestion, Highly toxic by skin absorption, Skin sensitiser, Corrosive, Mutagen

DSL Status
All components of this product are on the Canadian DSL list.

SARA 302 Components
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

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Pennsylvania Right To Know Components

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California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Further information
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