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

1.1 Product information

Product Name: Scentinel® A Gas Odorant
Material: 1119674, 1119564, 1106807, 1098462, 1102596, 1086453, 1098407, 1086452, 1102264, 1072060, 1098463, 1103512, 1070006, 1024777, 1024776, 1024775, 1024774, 1029441, 1029442, 1029443, 1029444, 1029445

EC-No. Registration number

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No. EC-No. Index No.</th>
<th>Legal Entity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethyl Mercaptan</td>
<td>75-08-1 200-837-3 016-022-00-9</td>
<td>Chevron Phillips Chemicals International NV 01-2119491286-30-0000</td>
</tr>
</tbody>
</table>

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

Relevant Identified Uses Supported: Manufacture of Ethanethiol used under Strictly Controlled Conditions
Use at Industrial Site - Intermediate
Injection as odorant in Liquified Petroleum Gas under Strictly Controlled Conditions – Industrial
Injection as odorant in Liquified Petroleum Gas under Strictly Controlled Conditions – Consumer

1.3 Details of the supplier of the safety data sheet

Company: Chevron Phillips Chemical Company LP
10001 Six Pines Drive
The Woodlands, TX 77380

Local: Chevron Phillips Chemicals International N.V.
Airport Plaza (Stockholm Building)
Leonardo Da Vinci Lane 19
1831 Diegem
Belgium
1.4 Emergency telephone:

**Health:**
866.442.9628 (North America)
1.832.813.4984 (International)

**Transport:**
CHEMTREC 800.424.9300 or 703.527.3887(int'l)
Asia: CHEMWATCH (+612 9186 1132) China: 0532 8388 9090
EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
Mexico CHEMTREC 01-800-681-9531 (24 hours)
South America SOS-Cotec Inside Brazil: 0800.111.767 Outside Brazil: +55.19.3467.1600
Argentina: +(54)-1159839431

Responsible Department : Product Safety and Toxicology Group
E-mail address : SDS@CPChem.com
Website : www.CPChem.com

ODOR-FADE WARNING

A GAS LEAK CAN CAUSE A FIRE OR EXPLOSION RESULTING IN SERIOUS INJURY OR DEATH.

Be aware that the stenching chemical added to gas to make it detectable may not warn of a gas leak or the presence of propane or natural gas to all persons in every instance.

Instances where the odorant in an odorized gas may be undetectable include:

- Odor intensity may fade or be eliminated for a variety of chemical and physical causes, including the oxidation of rusting pipes, adsorption into or sticking onto the interior of pipes or appliances, or absorption into liquids.
- Contact with soil in underground leaks may de-odorize or remove odorant from the gas.
- Some people have a diminished ability, or inability to smell the stench. Factors that negatively affect a person’s sense of smell include age, gender, medical conditions, and alcohol/tobacco usage.
- The stench of odorized gas may not awaken sleeping persons.
- Other odors may mask or hide the stench.
- Exposure to the odor for even a short period of time, may cause nasal fatigue, where a person can no longer smell the stench.

Gas detectors listed by the Underwriters Laboratories (UL) can be used as an extra measure of safety for detecting gas leaks, especially under conditions where the odorant alone may not provide an adequate warning. Gas detectors emit a loud, shrill sound when gas is present and do not depend on sense of smell. Because the odor intensity can fade or people may have problems with their sense of smell, we recommend installing, per manufacturer’s instructions, one or more combustible gas detectors, in suitable locations to ensure adequate coverage to detect gas leaks.

Educate yourself, your employees, and your customers with the content of this warning and other important facts associated with the so-called “odor-fade phenomenon.”
SECTION 2: Hazards identification

2.1 Classification of the substance or mixture
REGULATION (EC) No 1272/2008

<table>
<thead>
<tr>
<th>Classification</th>
<th>Hazards Statements</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammable liquids, Category 1</td>
<td>H224:</td>
<td>Extremely flammable liquid and vapor.</td>
</tr>
<tr>
<td>Acute toxicity, Category 4</td>
<td>H302:</td>
<td>Harmful if swallowed.</td>
</tr>
<tr>
<td>Acute toxicity, Category 4</td>
<td>H332:</td>
<td>Harmful if inhaled.</td>
</tr>
<tr>
<td>Skin sensitization, Sub-category 1B</td>
<td>H317:</td>
<td>May cause an allergic skin reaction.</td>
</tr>
<tr>
<td>Short-term (acute) aquatic hazard, Category 1</td>
<td>H400:</td>
<td>Very toxic to aquatic life.</td>
</tr>
<tr>
<td>Long-term (chronic) aquatic hazard, Category 1</td>
<td>H410:</td>
<td>Very toxic to aquatic life with long lasting effects.</td>
</tr>
</tbody>
</table>

2.2 Labeling (REGULATION (EC) No 1272/2008)

Hazard pictograms: 
- Flammable liquid
- Health hazard
- Precautionary measures against static discharge
- Environmental hazard

Signal Word: Danger

Hazard Statements: 
- H224: Extremely flammable liquid and vapor.
- H302: Harmful if swallowed.
- H317: May cause an allergic skin reaction.
- H332: Harmful if inhaled.
- H400: Very toxic to aquatic life.
- H410: Very toxic to aquatic life with long lasting effects.

Precautionary Statements: Prevention:
- P210: Keep away from heat/sparks/open flames/hot surfaces. No smoking.
- P233: Keep container tightly closed.
- P240: Ground/bond container and receiving equipment.
- P243: Take precautionary measures against static discharge.
- P273: Avoid release to the environment.
- P280: Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:
- P303 + P361 + P353: IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
- P304 + P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
- P312: Call a POISON CENTER/doctor if you feel unwell.

Storage:
- P403 + P235: Store in a well-ventilated place. Keep cool.

Disposal:
- P501: Dispose of contents/ container to an
Hazardous ingredients which must be listed on the label:
- 75-08-1 Ethyl Mercaptan

Additional Labeling:
The following percentage of the mixture consists of ingredient(s) with unknown hazards to the aquatic environment: 1%
The following percentage of the mixture consists of ingredient(s) with unknown acute toxicity: 1%

SECTION 3: Composition/information on ingredients

3.1 - 3.2 Substance or Mixture
Synonyms: ETSH, Ethanethiol, Ethyl Mercaptan

Molecular formula: C2H6S

Hazardous ingredients

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No. EC-No.</th>
<th>Classification (REGULATION (EC) No 1272/2008)</th>
<th>Concentration [wt%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethyl Mercaptan</td>
<td>75-08-1</td>
<td>Flam. Liq. 1; H224 Acute Tox. 4; H302 Acute Tox. 4; H332 Skin Sens. 1B; H317 Aquatic Acute 1; H400 Aquatic Chronic 1; H410</td>
<td>99</td>
</tr>
<tr>
<td></td>
<td>200-837-3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>016-022-00-9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice: Move out of dangerous area. Consult a physician. Show this material safety data sheet to the doctor in attendance. Symptoms of poisoning may appear several hours later. Do not leave the victim unattended.

If inhaled: Call a physician or poison control center immediately. If unconscious, place in recovery position and seek medical advice.

In case of skin contact: If on skin, rinse well with water. If on clothes, remove clothes.

In case of eye contact: Immediately flush eye(s) with plenty of water. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.
If swallowed : Keep respiratory tract clear. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician. Take victim immediately to hospital.

SECTION 5: Firefighting measures

Flash point : -48 °C (-54 °F)
Autoignition temperature : 295 °C (563 °F)

5.1 Extinguishing media
Suitable extinguishing media : Alcohol-resistant foam. Carbon dioxide (CO2). Dry chemical.
Unsuitable extinguishing media : High volume water jet.

5.2 Special hazards arising from the substance or mixture
Specific hazards during firefighting : Do not allow run-off from fire fighting to enter drains or water courses.

5.3 Advice for firefighters
Special protective equipment for fire-fighters : Wear self-contained breathing apparatus for firefighting if necessary.
Further information : Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. For safety reasons in case of fire, cans should be stored separately in closed containments. Use a water spray to cool fully closed containers.

Fire and explosion protection : Do not spray on an open flame or any other incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use only explosion-proof equipment. Keep away from open flames, hot surfaces and sources of ignition.
Hazardous decomposition products : Carbon oxides. Sulfur oxides.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Personal precautions : Use personal protective equipment. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.

6.2
## Environmental precautions

Environmental precautions: Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.

### Methods and materials for containment and cleaning up

**Methods for cleaning up:**
- Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

### Reference to other sections

Reference to other sections:
- For personal protection see section 8.
- For disposal considerations see section 13.

## SECTION 7: Handling and storage

### Precautions for safe handling

**Handling:**
- Avoid formation of aerosol. Do not breathe vapors/dust. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Take precautionary measures against static discharges. Provide sufficient air exchange and/or exhaust in work rooms. Open drum carefully as content may be under pressure. Dispose of rinse water in accordance with local and national regulations.

**Advice on protection against fire and explosion:**
- Do not spray on an open flame or any other incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use only explosion-proof equipment. Keep away from open flames, hot surfaces and sources of ignition.

### Conditions for safe storage, including any incompatibilities

**Storage:**
- Prevent unauthorized access. No smoking. 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. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.

## SECTION 8: Exposure controls/personal protection

### Control parameters
### Ingredients with workplace control parameters

<table>
<thead>
<tr>
<th>Country</th>
<th>Language</th>
<th>Ingredient</th>
<th>Basis</th>
<th>Value</th>
<th>Control parameters</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>SK</td>
<td>Zložky</td>
<td>Ethyl Mercaptan</td>
<td>SK OEL</td>
<td>NPEL priemerný</td>
<td>0,5 ppm, 1,3 mg/m³</td>
<td></td>
</tr>
<tr>
<td>SI</td>
<td>Osnowa</td>
<td>Ethyl Mercaptan</td>
<td>SI OEL</td>
<td>MV</td>
<td>0,5 ppm, 1,3 mg/m³</td>
<td></td>
</tr>
<tr>
<td>PT</td>
<td>Componentes</td>
<td>Ethyl Mercaptan</td>
<td>PT OEL</td>
<td>VLE-MP</td>
<td>0,5 ppm,</td>
<td>irritação do TRS, irritação do SNC,</td>
</tr>
<tr>
<td>PL</td>
<td>Składniki</td>
<td>Ethyl Mercaptan</td>
<td>PL NDS</td>
<td>NDS</td>
<td>1 mg/m³</td>
<td></td>
</tr>
<tr>
<td>NO</td>
<td>Komponenter</td>
<td>Ethyl Mercaptan</td>
<td>FOR-2011-12-06-1358</td>
<td>GV</td>
<td>0,5 ppm, 1 mg/m³</td>
<td></td>
</tr>
<tr>
<td>LV</td>
<td>Sastāvdalas</td>
<td>Ethyl Mercaptan</td>
<td>LV OEL</td>
<td>AER 8 st</td>
<td>1 mg/m³</td>
<td></td>
</tr>
<tr>
<td>LT</td>
<td>Komponentai</td>
<td>Ethyl Mercaptan</td>
<td>LT OEL</td>
<td>IPRD</td>
<td>1 mg/m³</td>
<td>O.</td>
</tr>
<tr>
<td>IE</td>
<td>Components</td>
<td>Ethyl Mercaptan</td>
<td>IE OEL</td>
<td>OELV - 8 hrs (TWA)</td>
<td>0,5 ppm, 1 mg/m³</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>IE OEL</td>
<td>OELV - 15 min (STEL)</td>
<td>2 ppm, 3 mg/m³</td>
<td></td>
</tr>
<tr>
<td>HU</td>
<td>Komponensek</td>
<td>Ethyl Mercaptan</td>
<td>HU OEL</td>
<td>AK-érték</td>
<td>1 mg/m³</td>
<td>i,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>HU OEL</td>
<td>CK-érték</td>
<td>1 mg/m³</td>
<td>i,</td>
</tr>
<tr>
<td>GR</td>
<td>Συστατικά</td>
<td>Ethyl Mercaptan</td>
<td>GR OEL</td>
<td>TWA</td>
<td>10 ppm, 25 mg/m³</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>GR OEL</td>
<td>STEL</td>
<td>10 ppm, 25 mg/m³</td>
<td></td>
</tr>
<tr>
<td>GB</td>
<td>Components</td>
<td>Ethyl Mercaptan</td>
<td>GB EH40</td>
<td>TWA</td>
<td>0,5 ppm, 1,3 mg/m³</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>GB EH40</td>
<td>STEL</td>
<td>2 ppm, 5,2 mg/m³</td>
<td></td>
</tr>
<tr>
<td>FR</td>
<td>Composants</td>
<td>Ethyl Mercaptan</td>
<td>FR VLE</td>
<td>VME</td>
<td>0,5 ppm, 1 mg/m³</td>
<td>normal,</td>
</tr>
<tr>
<td>FI</td>
<td>Aineosat</td>
<td>Ethyl Mercaptan</td>
<td>FI OEL</td>
<td>HTP-arvoi 15 min</td>
<td>0,5 ppm, 1,3 mg/m³</td>
<td></td>
</tr>
<tr>
<td>ES</td>
<td>Componentes</td>
<td>Ethyl Mercaptan</td>
<td>ES VLA</td>
<td>VLA-ED</td>
<td>0,5 ppm, 1,3 mg/m³</td>
<td></td>
</tr>
</tbody>
</table>
SAFETY DATA SHEET

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8.2 Exposure controls

DNEL:
- End Use: Workers
  - Routes of exposure: Inhalation
  - Potential health effects: Chronic effects, Systemic effects
  - Value: 14,5 mg/m³

DNEL:
- End Use: Workers
  - Routes of exposure: Skin contact
  - Potential health effects: Chronic effects, Systemic effects
  - Value: 2,06 mg/kg

DNEL:
- End Use: Workers
  - Routes of exposure: Inhalation
  - Potential health effects: Chronic effects, Local effects
  - Value: 18,6 mg/m³

PNEC:
- Fresh water
  - Value: 0,0001 mg/l

PNEC:
- Marine water
  - Value: 0,00001 mg/l

PNEC:
- Fresh water sediment
  - Value: 0,00049 mg/kg

PNEC:
- Marine sediment
  - Value: 0,000049 mg/kg

PNEC:
- Soil
  - Value: 0,000039 mg/kg
### Engineering measures

Adequate ventilation to control airborne concentrations below the exposure guidelines/limits. Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

### Personal protective equipment

**Respiratory protection**: Wear a supplied-air NIOSH approved respirator unless ventilation or other engineering controls are adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure. Wear a NIOSH approved respirator that provides protection when working with this material if exposure to harmful levels of airborne material may occur, such as: Air-Purifying Respirator for Organic Vapors. Use a positive pressure, air-supplying respirator if there is potential for uncontrolled release, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection.

**Hand protection**: The suitability for a specific workplace should be discussed with the producers of the protective gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

**Eye protection**:
- Eye wash bottle with pure water.
- Tightly fitting safety goggles.
- Wear face-shield and protective suit for abnormal processing problems.

**Skin and body protection**: Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place. Wear as appropriate:
- Remove and wash contaminated clothing before re-use.
- Skin should be washed after contact.
- Flame retardant protective clothing.
- Workers should wear antistatic footwear.

**Hygiene measures**:
- Avoid contact with skin, eyes and clothing.
- When using do not eat or drink.
- When using do not smoke.
- Wash hands before breaks and immediately after handling the product.

For additional details, see the Exposure Scenario in the Annex portion.

### SECTION 9: Physical and chemical properties

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

**Appearance**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form</td>
<td>Liquid</td>
</tr>
<tr>
<td>Physical state</td>
<td>Liquid</td>
</tr>
</tbody>
</table>

SDS Number: 100000068741
**Scentinel® A Gas Odorant**

**Version 3.2**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Color</strong></td>
<td>Colorless</td>
</tr>
<tr>
<td><strong>Odor</strong></td>
<td>Repulsive</td>
</tr>
<tr>
<td><strong>Safety data</strong></td>
<td></td>
</tr>
<tr>
<td>Flash point</td>
<td>-48 °C (-54 °F)</td>
</tr>
<tr>
<td>Lower explosion limit</td>
<td>2.8 %(V)</td>
</tr>
<tr>
<td>Upper explosion limit</td>
<td>18 %(V)</td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>No</td>
</tr>
<tr>
<td>Autoignition temperature</td>
<td>295 °C (563 °F)</td>
</tr>
<tr>
<td>Molecular formula</td>
<td>C2H6S</td>
</tr>
<tr>
<td>Molecular weight</td>
<td>62.14 g/mol</td>
</tr>
<tr>
<td><strong>pH</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td>Pour point</td>
<td>No data available</td>
</tr>
<tr>
<td>Boiling point/boiling range</td>
<td>35 °C (95 °F)</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>16.20 PSI</td>
</tr>
<tr>
<td></td>
<td>at 37.8 °C (100.0 °F)</td>
</tr>
<tr>
<td>Relative density</td>
<td>0.84</td>
</tr>
<tr>
<td></td>
<td>at 15.6 °C (60.1 °F)</td>
</tr>
<tr>
<td>Water solubility</td>
<td>Negligible</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity, kinematic</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative vapor density</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td>(Air = 1.0)</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>1</td>
</tr>
<tr>
<td>Percent volatile</td>
<td>&gt; 99 %</td>
</tr>
</tbody>
</table>

**SECTION 10: Stability and reactivity**

10.1

**Reactivity**

Stable under recommended storage conditions.

10.2
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Chemical stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

10.3 Possibility of hazardous reactions

Hazardous reactions: Hazardous reactions: Hazardous polymerization does not occur.

Further information: No decomposition if stored and applied as directed.

Hazardous reactions: Vapors may form explosive mixture with air.

10.4 Conditions to avoid: Heat, flames and sparks.

10.5 Materials to avoid: May react with oxygen and strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

10.6 Hazardous decomposition products: Carbon oxides
Sulfur oxides

Other data: No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute oral toxicity
Ethyl Mercaptan: LD50: 682 mg/kg
Species: Rat
Sex: male
Method: Fixed Dose Method

Acute inhalation toxicity
Ethyl Mercaptan: LC50: 11,23 mg/l
Exposure time: 4 h
Species: Rat
Sex: male
Test atmosphere: vapor

Skin irritation
Ethyl Mercaptan: slight irritation.

Eye irritation
Ethyl Mercaptan: Information given is based on data obtained from similar substances.
Sensitization
Ethyl Mercaptan: The product is a skin sensitizer, sub-category 1B. Information given is based on data obtained from similar substances.

Repeated dose toxicity
Ethyl Mercaptan: Species: Rat, Male and female
Sex: Male and female
Application Route: Inhalation
Dose: 25, 100, 400 ppm
Exposure time: 13 wks
Number of exposures: 6 hr/d, 5 d/wk
NOEL: 100 ppm
Lowest observable effect level: 400 ppm
Method: OECD Guideline 413
Information given is based on data obtained from similar substances.

Species: Rat, Male and female
Sex: Male and female
Application Route: Oral
Dose: 0, 10, 50, 200 mg/kg
Exposure time: 42-53 days
NOEL: 50 mg/kg
Method: OECD Guideline 422
Information given is based on data obtained from similar substances.

Species: Rat, Male and female
Sex: Male and female
Application Route: Inhalation
Dose: 9, 97, 196 ppm
Exposure time: 13 wks
Number of exposures: 6 hr/d, 5 d/wk
NOEL: >=196 ppm
Method: OECD Guideline 413
Information given is based on data obtained from similar substances.

Species: Rat, Male and female
Sex: Male and female
Application Route: Inhalation
Dose: 0.03, 0.26, 0.55 mg/L
Exposure time: 13 wks
Number of exposures: 6 hr/d, 5 d/wk
NOEL: 0.03 mg/l
Method: OECD Test Guideline 413
Information given is based on data obtained from similar substances.

Genotoxicity in vitro
Ethyl Mercaptan: Test Type: Ames test
Metabolic activation: with and without metabolic activation
Method: Mutagenicity (Escherichia coli - reverse mutation assay)
Result: negative
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Test Type: Mouse lymphoma assay
Method: OECD Guideline 476
Result: Ambiguous

Test Type: Sister Chromatid Exchange Assay
Metabolic activation: with and without metabolic activation
Result: positive

Genotoxicity in vivo
Ethyl Mercaptan :

Test Type: Micronucleus test
Species: Mouse
Method: Mutagenicity (micronucleus test)
Result: negative

Reproductive toxicity
Ethyl Mercaptan :
Species: Rat
Sex: male and female
Application Route: Oral diet
Dose: 0, 10, 50, 200 mg/kg
Exposure time: 42-53 days
Number of exposures: once daily
Method: OECD Guideline 422
NOAEL Parent: 200 mg/kg
NOAEL F1: 50 mg/kg
Information given is based on data obtained from similar substances.

Developmental Toxicity
Ethyl Mercaptan :
Species: Rat
Application Route: Inhalation
Dose: 0, 0.037, 0.28, or 0.56 mg/L
Number of exposures: 6 hrs/d
Test period: GD 6-19
Method: OECD Guideline 414
NOAEL Teratogenicity: > 0.56 mg/L
Information given is based on data obtained from similar substances.

Species: Rat
Application Route: Inhalation
Dose: 0, 10, 100, 200 ppm
Number of exposures: 6 hrs/d
Test period: GD 6-19
Method: OECD Guideline 414
NOAEL Teratogenicity: > 200 ppm
NOAEL Maternal: > 200 ppm
Information given is based on data obtained from similar substances.

Aspiration toxicity
Ethyl Mercaptan :
May be harmful if swallowed and enters airways.

CMR effects
Ethyl Mercaptan: Carcinogenicity: Not available
          Mutagenicity: Not mutagenic in Ames Test.
          Teratogenicity: Animal testing did not show any effects on fetal development.
          Reproductive toxicity: Animal testing did not show any effects on fertility.

Scentinel® A Gas Odorant
Further information: Solvents may degrease the skin.

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish
Ethyl Mercaptan: 2.4 mg/l
          Exposure time: 96 h
          Species: Oncorhynchus mykiss (rainbow trout)
          Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates
Ethyl Mercaptan: EC50: < 0.1 mg/l
          Exposure time: 48 h
          Species: Daphnia magna (Water flea)
          static test Method: OECD Test Guideline 202

Toxicity to algae
Ethyl Mercaptan: EC50: 3 mg/l
          Exposure time: 72 h
          Species: Pseudokirchneriella subcapitata (green algae)
          Method: OECD Test Guideline 201

M-Factor
ethanethiol: M-Factor (Acute Aquat. Tox.) 10
          M-Factor (Chron. Aquat. Tox.) 10

12.2 Persistence and degradability

Biodegradability: This material is not expected to be readily biodegradable.

12.3 Bioaccumulative potential

Elimination information (persistence and degradability)

Bioaccumulation: This material is not expected to bioaccumulate.

12.4 Mobility in soil
Mobility

Ethyl Mercaptan : No data available

12.5 Results of PBT and vPvB assessment

Results of PBT assessment
Ethyl Mercaptan : Non-classified PBT substance, Non-classified vPvB substance

12.6 Other adverse effects

Additional ecological information : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Very toxic to aquatic life with long lasting effects.

Ecotoxicology Assessment

Short-term (acute) aquatic hazard
Ethyl Mercaptan : Very toxic to aquatic life.

Long-term (chronic) aquatic hazard
Ethyl Mercaptan : Very toxic to aquatic life with long lasting effects.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

The information in this SDS pertains only to the product as shipped.

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

Product : The product should not be allowed to enter drains, water courses or the soil. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.

Contaminated packaging : Empty remaining contents. Dispose of as unused product. Do not re-use empty containers. Do not burn, or use a cutting torch on, the empty drum.

For additional details, see the Exposure Scenario in the Annex portion

SECTION 14: Transport information

14.1 - 14.7 Transport information

The shipping descriptions shown here are for bulk shipments only, and may not apply to shipments in non-bulk packages (see regulatory definition).
Consult the appropriate domestic or international mode-specific and quantity-specific Dangerous Goods Regulations for additional shipping description requirements (e.g., technical name or names, etc.). Therefore, the information shown here, may not always agree with the bill of lading shipping description for the material. Flashpoints for the material may vary slightly between the SDS and the bill of lading.

**US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)**
UN2363, ETHYL MERCAPTAN, 3, I, MARINE POLLUTANT, (ETHYL MERCAPTAN)

**IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)**
UN2363, ETHYL MERCAPTAN, 3, I, (-48 °C), MARINE POLLUTANT, (ETHYL MERCAPTAN)

**IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)**
UN2363, ETHYL MERCAPTAN, 3, I

**ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))**
UN2363, ETHYL MERCAPTAN, 3, I, (D/E), ENVIRONMENTALLY HAZARDOUS, (ETHYL MERCAPTAN)

**RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))**
UN2363, ETHYL MERCAPTAN, 3, I, ENVIRONMENTALLY HAZARDOUS, (ETHYL MERCAPTAN)

**ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)**
UN2363, ETHYL MERCAPTAN, 3, I, ENVIRONMENTALLY HAZARDOUS, (ETHYL MERCAPTAN)

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

**SECTION 15: Regulatory information**

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

Water contaminating class (Germany) : WGK 3 highly water endangering

15.2 Chemical Safety Assessment
Components: ethanethiol

A Chemical Safety Assessment has been carried out for this substance.

Major Accident Hazard Legislation:

- 96/82/EC Update: 2003
  - Highly flammable
  - Quantity 1: 5,000 t
  - Quantity 2: 50,000 t

- 96/82/EC Update: 2003
  - Dangerous for the environment
  - Quantity 1: 100 t
  - Quantity 2: 200 t

Notification status:

- Europe REACH: On the inventory, or in compliance with the inventory
- United States of America (USA) TSCA: On the inventory, or in compliance with the inventory
- Canada DSL: On the inventory, or in compliance with the inventory
- Australia AICS: On the inventory, or in compliance with the inventory
- New Zealand NZIoC: On the inventory, or in compliance with the inventory
- Japan ENCS: On the inventory, or in compliance with the inventory
- Korea KECI: On the inventory, or in compliance with the inventory
- Philippines PICCS: On the inventory, or in compliance with the inventory
- China IECSC: On the inventory, or in compliance with the inventory

SECTION 16: Other information

NFPA Classification:

- Health Hazard: 2
- Fire Hazard: 4
- Reactivity Hazard: 0

Significant changes since the last version are highlighted in the margin. This version replaces all previous versions.

The information in this SDS pertains only to the product as shipped.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.
**SAFETY DATA SHEET**

**Scentinel® A Gas Odorant**

**Version 3.2**

**Revision Date 2019-06-13**

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
<th>LD50</th>
<th>LOAEL</th>
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<tr>
<td>ACGIH</td>
<td>American Conference of Government Industrial Hygienists</td>
<td>Lethal Dose 50%</td>
<td>Lowest Observed Adverse Effect Level</td>
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<td>LOAEL</td>
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<td>Central Nervous System</td>
<td>NTP</td>
<td>National Toxicology Program</td>
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<td>OSHA</td>
<td>Occupational Safety &amp; Health Administration</td>
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<td>European Oilfield Specialty Chemicals Association</td>
<td>PEL</td>
<td>Permissible Exposure Limit</td>
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<td>PICCS</td>
<td>Philippines Inventory of Commercial Chemical Substances</td>
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<td>Germany Maximum Concentration Values</td>
<td>PRNT</td>
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<td>RCRA</td>
<td>Resource Conservation Recovery Act</td>
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<td>Inhibition Concentration 50%</td>
<td>SARAX</td>
<td>Superfund Amendments and Reauthorization Act</td>
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<td>International Agency for Research on Cancer</td>
<td>TLV</td>
<td>Threshold Limit Value</td>
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<td>Toxic Substance Control Act</td>
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**Full text of H-Statements referred to under sections 2 and 3.**

H224 Extremely flammable liquid and vapor.
H302 Harmful if swallowed.
H317 May cause an allergic skin reaction.
H332 Harmful if inhaled.
H400 Very toxic to aquatic life.
H410 Very toxic to aquatic life with long lasting effects.