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

Product information

Product Name: Scentinel® E Gas Odorant

Material: 1123217, 1106808, 1086435, 1086434, 1095112, 1079767, 1064505, 1098464, 1098226, 1024677, 1024673, 1034741, 1024674, 1024676, 1024678, 1024780, 1024782, 1024781, 1024778, 1024783, 1036153, 1024779, 1024675, 1105014

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

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

Classification of the substance or mixture
This product has been classified in accordance with the hazard communication standard 29 CFR 1910.1200; the SDS and labels contain all the information as required by the standard.

Classification
: Flammable liquids, Category 2
Skin sensitization, Category 1

Labeling
Symbol(s) :

Signal Word :
Danger

Hazard Statements :
H225: Highly flammable liquid and vapor.
H317: May cause an allergic skin reaction.

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.
P241 Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.
P261 Avoid breathing dust/fume/gas/mist/vapors/spray.
P264 Wash skin thoroughly after handling.
P272 Contaminated work clothing should not be allowed out of the workplace.
P280 Wear protective gloves/ 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.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P363 Wash contaminated clothing before reuse.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.

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

Disposal:
P501 Dispose of contents/ container to an approved waste disposal plant.

Carcinogenicity:

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

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

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

SECTION 3: Composition/information on ingredients

Synonyms:
Mercaptan Mixture
Gas Odorant

Molecular formula:
Mixture

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>t-Butyl Mercaptan</td>
<td>75-66-1</td>
<td>75 - 80</td>
</tr>
<tr>
<td>Isopropyl Mercaptan</td>
<td>75-33-2</td>
<td>13 - 18</td>
</tr>
<tr>
<td>n-Propyl Mercaptan</td>
<td>107-03-9</td>
<td>3 - 8</td>
</tr>
</tbody>
</table>

SECTION 4: First aid measures

General advice:
Move out of dangerous area. 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:
Move to fresh air. If unconscious, place in recovery position and seek medical advice. If symptoms persist, call a physician.

In case of skin contact:
If skin irritation persists, call a physician. 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. Do NOT induce vomiting. Do not give milk or alcoholic beverages. Never give anything by mouth to an unconscious person. Take victim immediately to hospital.

SECTION 5: Firefighting measures

Flash point: -18°C (0°F) estimated

Autoignition temperature: 200°C (392°F)

Suitable extinguishing media: Dry chemical. Carbon dioxide (CO2). Alcohol-resistant foam.

Unsuitable extinguishing media: High volume water jet.

Specific hazards during firefighting: Do not allow run-off from fire fighting to enter drains or water courses.

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. Use only explosion-proof equipment. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Keep away from open flames, hot surfaces and sources of ignition.

Hazardous decomposition products: Carbon oxides. Sulfur oxides.

SECTION 6: Accidental release measures

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.

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 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).

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

SECTION 7: Handling and storage

Handling

Advice on safe handling: Avoid formation of aerosol. Do not breathe vapors/dust. Avoid exposure - obtain special instructions before use. 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. Persons susceptible to skin sensitization problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.

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

Storage

Requirements for storage areas and containers: 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

Chevron Phillips Chemical Company LP

<table>
<thead>
<tr>
<th>Components</th>
<th>Basis</th>
<th>Value</th>
<th>Control parameters</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>t-Butyl Mercaptan</td>
<td>Manufacturer</td>
<td>TWA</td>
<td>0.5 ppm.</td>
<td></td>
</tr>
</tbody>
</table>

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.

Skin and body protection: Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific workplace. Wear as appropriate: Flame retardant antistatic protective clothing. Workers should wear antistatic footwear.

Hygiene measures: When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

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

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

**Appearance**
- Physical state: Liquid
- Color: Clear
- Odor: Repulsive

**Safety data**
- Flash point: -18°C (0°F) estimated
- Lower explosion limit: 1.4 % (V)
- Upper explosion limit: 12.5 % (V)
- Oxidizing properties: no
- Autoignition temperature: 200°C (392°F)
- Thermal decomposition: No data available
Molecular formula : Mixture
Molecular weight : Not applicable
pH : Not applicable
Pour point : No data available

Boiling point/boiling range : 57-60°C (135-140°F)
Vapor pressure : 48.00 kPa
at 38°C (100°F)
Relative density : 0.81
at 16 °C (61 °F)
Water solubility : Negligible
Partition coefficient: n-octanol/water : No data available
Viscosity, kinematic : No data available
Relative vapor density : 2
(Air = 1.0)
Evaporation rate : > 1
(N-Butyl Acetate = 1)
Percent volatile : > 99 %

SECTION 10: Stability and reactivity

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

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.

Conditions to avoid : Not applicable.

Materials to avoid : May react with oxygen and strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Thermal decomposition: No data available

Hazardous decomposition products:
- Carbon oxides
- Sulfur oxides

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

SECTION 11: Toxicological information

**Scintinel® E Gas Odorant**

**Acute oral toxicity**
- Acute toxicity estimate: 10,366 mg/kg
  - Method: Calculation method
- Acute toxicity estimate: > 5,000 mg/kg
  - Method: Calculation method

**Acute inhalation toxicity**

**t-Butyl Mercaptan**
- LC50: 98.3 mg/l
  - Exposure time: 4 h
  - Species: Rat
  - Sex: male and female
  - Test atmosphere: vapor
  - Method: OECD Test Guideline 403
- LC50: 81.9 mg/l
  - Exposure time: 4 h
  - Species: Rat
  - Sex: male
  - Test atmosphere: vapor
  - Method: OECD Test Guideline 403
- LC50: 60.9 mg/l
  - Exposure time: 4 h
  - Species: Mouse
  - Sex: male
  - Test atmosphere: vapor
  - Method: OECD Test Guideline 403

**Isopropyl Mercaptan**
- LC50: > 32.24 mg/l
  - Exposure time: 4 h
  - Species: Rat
  - Sex: male and female
  - Test atmosphere: vapor
  - Method: OECD Test Guideline 403
  - Test substance: yes
  - An LC50/inhalation/4h/rat could not be determined because no mortality of rats was observed at the maximum achievable concentration.

**n-Propyl Mercaptan**
- LC50: > 5.67 mg/l
  - Exposure time: 4 h
  - Species: Rat
  - Sex: male and female
  - Test atmosphere: vapor
  - Method: OECD Test Guideline 403
An LC50/inhalation/4h/rat could not be determined because no mortality of rats was observed at the maximum achievable concentration.

**Acute dermal toxicity**

Isopropyl Mercaptan : LD50: > 2,000 mg/kg  
Species: Rat  
Sex: male  
n-Propyl Mercaptan  
LD50: > 2,000 mg/kg  
Species: Rabbit  
Sex: male and female  
Method: OECD Test Guideline 402

**Scentinel® E Gas Odorant Skin irritation** : May cause skin irritation and/or dermatitis.

**Scentinel® E Gas Odorant Eye irritation** : May cause irreversible eye damage.

**Scentinel® E Gas Odorant Sensitization** : Causes sensitization.

**Repeated dose toxicity**

t-Butyl Mercaptan  
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 hrs/d, 5 d/wk  
NOEL: > 196 ppm  
Species: Rat, Male and female  
Sex: Male and female  
Application Route: oral gavage  
Dose: 10, 50, 200 mg/kg bw/day  
Exposure time: 42-53 days  
Number of exposures: Daily  
NOEL: 50 mg/kg bw/day  
Lowest observable effect level: 200 mg/kg bw/day  
Method: OECD Guideline 422

Species: Rat, Male and female  
Sex: Male and female  
Application Route: Inhalation  
Dose: 25.1, 99.6, 403.4 ppm  
Exposure time: 13 wks  
Number of exposures: 6 hrs/d, 5 d/wk  
NOEL: 99.6 ppm  
Lowest observable effect level: 403.4 ppm  
Method: OECD Guideline 413  
Target Organs: Liver, Kidney, Blood, Upper respiratory tract

Information given is based on data obtained from similar substances.

Isopropyl Mercaptan  
Species: Rat, male and female  
Sex: male and female
Application Route: Inhalation
Exposure time: 13 wks
Number of exposures: 6hrs/d, 5 d/wk
NOEL: 0.367 mg/l 99.6 ppm
Lowest observable effect level: 1.488 mg/l 403.4 ppm
Method: OECD Test Guideline 413
Target Organs: Liver, Kidney, Upper respiratory tract, Blood
Information given is based on data obtained from similar substances.

Species: Rat, male and female
Sex: male and female
Application Route: oral gavage
Dose: 10, 50, 200 mg/kg bw/day
Exposure time: 42-53 days
Number of exposures: Daily
NOEL: 50 mg/kg
Lowest observable effect level: 200 mg/kg
Method: OECD Guideline 422
Target Organs: Liver, Blood
Information given is based on data obtained from similar substances.

Species: Rat, male and female
Sex: male and female
Application Route: Inhalation
Exposure time: 13 wks
Number of exposures: 6hrs/d, 5 d/wk
NOEL: >= 196 ppm
Method: OECD Test Guideline 413
Target Organs: Kidney, Upper respiratory tract, Blood
Information given is based on data obtained from similar substances.

n-Propyl Mercaptan
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 hrs/d, 5 d/wk
NOEL: 196 ppm
Method: OECD Test Guideline 413
Information given is based on data obtained from similar substances.

Genotoxicity in vitro

t-Butyl Mercaptan: Test Type: Mouse lymphoma assay
Metabolic activation: with and without metabolic activation
Result: negative
<table>
<thead>
<tr>
<th>Substance</th>
<th>Test Type</th>
<th>Metabolic activation</th>
<th>Method</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isopropyl Mercaptan</td>
<td>Sister Chromatid Exchange Assay</td>
<td>with and without metabolic activation</td>
<td>OECD Test Guideline 471</td>
<td>negative</td>
</tr>
<tr>
<td></td>
<td>Ames test</td>
<td>with and without metabolic activation</td>
<td>OECD Test Guideline 471</td>
<td>negative</td>
</tr>
<tr>
<td></td>
<td>reverse mutation assay</td>
<td></td>
<td>OECD Test Guideline 471</td>
<td>negative</td>
</tr>
<tr>
<td></td>
<td>Salmonella typhimurium</td>
<td></td>
<td>OECD Test Guideline 471</td>
<td>negative</td>
</tr>
<tr>
<td></td>
<td>Micronucleus test</td>
<td>with and without metabolic activation</td>
<td>OECD Test Guideline 487</td>
<td>negative</td>
</tr>
<tr>
<td></td>
<td>Mouse lymphoma assay</td>
<td>with and without metabolic activation</td>
<td>OECD Test Guideline 490</td>
<td>negative</td>
</tr>
<tr>
<td></td>
<td>Cytogenetic assay</td>
<td>with and without metabolic activation</td>
<td>OECD Test Guideline 473</td>
<td>negative</td>
</tr>
<tr>
<td></td>
<td>Mouse lymphoma assay</td>
<td>with and without metabolic activation</td>
<td>OECD Test Guideline 476</td>
<td>negative</td>
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<tr>
<td></td>
<td>Remarks</td>
<td></td>
<td>Information given is based on data obtained from similar substances.</td>
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</tbody>
</table>

**Genotoxicity in vivo**

<table>
<thead>
<tr>
<th>Substance</th>
<th>Test Type</th>
<th>Species</th>
<th>Dose</th>
<th>Method</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>t-Butyl Mercaptan</td>
<td>Mouse micronucleus assay</td>
<td>Mouse</td>
<td>1250, 2500, 5000 mg/kg</td>
<td>Mutagenicity (micronucleus test)</td>
<td>negative</td>
</tr>
</tbody>
</table>

**Reproductive toxicity**

<table>
<thead>
<tr>
<th>Substance</th>
<th>Species</th>
<th>Sex</th>
<th>Application Route</th>
<th>Dose</th>
<th>Number of exposures</th>
<th>Test period</th>
<th>Method</th>
<th>NOAEL Parent</th>
</tr>
</thead>
<tbody>
<tr>
<td>t-Butyl Mercaptan</td>
<td>Rat</td>
<td>male and female</td>
<td>oral gavage</td>
<td>10, 50, 200 mg/kg bw/day</td>
<td>Daily</td>
<td>42-53 days</td>
<td>OECD Guideline 422</td>
<td>200 mg/kg bw/day</td>
</tr>
</tbody>
</table>
NOAEL F1: 50 mg/kg bw/day
No adverse effects expected

Isopropyl Mercaptan
Species: Rat
Sex: male and female
Application Route: oral gavage
Dose: 10, 50, 200 mg/kg/bw
Exposure time: 42 d
Number of exposures: 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.
No adverse effects expected

Developmental Toxicity

t-Butyl Mercaptan:
Species: Mouse
Application Route: Inhalation
Dose: 11, 99, 195 ppm
Exposure time: GD 6-16
Number of exposures: 6 hrs/d
NOAEL Teratogenicity: >= 195 ppm
NOAEL Maternal: >= 195 ppm

Species: Rat
Application Route: Inhalation
Dose: 11, 99, 195 ppm
Exposure time: GD6-19
Number of exposures: 6 hrs/d
NOAEL Teratogenicity: >=195 ppm
NOAEL Maternal: >= 195 ppm

Species: Rat
Application Route: oral gavage
Dose: 10, 50, 200 mg/kg bw/day
Exposure time: 42-53 days
Number of exposures: Daily
NOAEL Teratogenicity: 50 mg/kg bw /day
NOAEL Maternal: 200 mg/kg bw /day

Isopropyl Mercaptan
Species: Rat
Application Route: Inhalation
Dose: 11, 99, 195 ppm
Exposure time: 6h/d
Test period: GD 9 - 19
Method: OECD Guideline 414
NOAEL Teratogenicity: >= 195 ppm
NOAEL Maternal: >= 195 ppm
Information given is based on data obtained from similar substances.
**Species**: Mouse  
**Application Route**: Inhalation  
**Dose**: 11, 99, 195 ppm  
**Exposure time**: 6h/d  
**Test period**: GD 9 - 19  
**Method**: OECD Guideline 414  
**NOAEL Teratogenicity**: >= 195 ppm  
**NOAEL Maternal**: >= 195 ppm  
Information given is based on data obtained from similar substances.

**Aspiration toxicity**  
Scentinel® E Gas Odorant May be harmful if swallowed and enters airways. Substances known to cause human aspiration toxicity hazards or to be regarded as if they cause human aspiration toxicity hazard.

**CMR effects**

- **t-Butyl Mercaptan**: Carcinogenicity: Not available  
  Mutagenicity: Did not show mutagenic effects in animal experiments.  
  Teratogenicity: Did not show teratogenic effects in animal experiments.  
  Reproductive toxicity: No toxicity to reproduction

- **Isopropyl Mercaptan**: Carcinogenicity: Not available  
  Mutagenicity: In vitro tests did not show mutagenic effects  
  Reproductive toxicity: No evidence of adverse effects on sexual function and fertility, or on development, based on animal experiments.

- **n-Propyl Mercaptan**: Carcinogenicity: Not available  
  Mutagenicity: In vitro tests did not show mutagenic effects  
  Reproductive toxicity: No evidence of adverse effects on sexual function and fertility, or on development, based on animal experiments.  
  No toxicity to reproduction

**Further information**  
Scentinel® E Gas Odorant Concentrations substantially above the TLV value may cause narcotic effects. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting. Solvents may degrease the skin.

**SECTION 12: Ecological information**

**Toxicity to fish**

- **t-Butyl Mercaptan**: LC50: 34 mg/l  
  Exposure time: 96 h  
  Species: Oncorhynchus mykiss (rainbow trout)  
  semi-static test Method: OECD Test Guideline 203

- **Isopropyl Mercaptan**: LC50: 34 mg/l  
  Exposure time: 96 h  
  semi-static test Analytical monitoring: yes
Method: OECD Test Guideline 203
Information given is based on data obtained from similar substances.

<table>
<thead>
<tr>
<th>Compound</th>
<th>LC50: 1.3 mg/l</th>
<th>Exposure time: 96 h</th>
<th>Species: Pimephales promelas (fathead minnow)</th>
<th>semi-static test Analytical monitoring: yes</th>
<th>Test substance: yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>n-Propyl Mercaptan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Toxicity to daphnia and other aquatic invertebrates

<table>
<thead>
<tr>
<th>Compound</th>
<th>EC50: 6.7 mg/l</th>
<th>Exposure time: 48 h</th>
<th>Species: Daphnia magna (Water flea)</th>
<th>static test Method: OECD Test Guideline 202</th>
</tr>
</thead>
<tbody>
<tr>
<td>t-Butyl Mercaptan</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Compound</th>
<th>EC50: 0.25 - 0.5 mg/l</th>
<th>Exposure time: 48 h</th>
<th>Species: Daphnia magna (Water flea)</th>
<th>static test Test substance: yes</th>
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<tbody>
<tr>
<td>Isopropyl Mercaptan</td>
<td></td>
<td></td>
<td></td>
<td>Method: OECD Test Guideline 202</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Compound</th>
<th>EC50: 70 µg/l</th>
<th>Exposure time: 48 h</th>
<th>Species: Daphnia magna (Water flea)</th>
<th>Analytical monitoring: yes</th>
<th>Test substance: yes</th>
</tr>
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<tbody>
<tr>
<td>n-Propyl Mercaptan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Toxicity to algae

<table>
<thead>
<tr>
<th>Compound</th>
<th>EC50: 24 mg/l</th>
<th>Exposure time: 72 h</th>
<th>Species: Pseudokirchneriella subcapitata (green algae)</th>
<th>Method: OECD Test Guideline 201</th>
</tr>
</thead>
<tbody>
<tr>
<td>t-Butyl Mercaptan</td>
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<th>Compound</th>
<th>ErC50: 21.9 mg/l</th>
<th>Exposure time: 72 h</th>
<th>Species: Pseudokirchneriella subcapitata (green algae)</th>
<th>static test Method: OECD Test Guideline 201</th>
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<tr>
<td>Isopropyl Mercaptan</td>
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</tbody>
</table>

<table>
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<tr>
<th>Compound</th>
<th>ErC50: 3 mg/l</th>
<th>Exposure time: 72 h</th>
<th>Species: Pseudokirchneriella subcapitata (algae)</th>
<th>Growth inhibition Method: OECD Test Guideline 201</th>
</tr>
</thead>
<tbody>
<tr>
<td>n-Propyl Mercaptan</td>
<td></td>
<td></td>
<td></td>
<td>Information given is based on data obtained from similar substances.</td>
</tr>
</tbody>
</table>

M-Factor

| Compound           | M-Factor (Acute Aquat. Tox.) | M-Factor (Chron. Aquat. Tox.) |
|--------------------|------------------------------|------------------------------|--------------------------------|
| propane-2-thiol    |                              |                              | 1                              |

| Compound           | M-Factor (Acute Aquat. Tox.) | M-Factor (Chron. Aquat. Tox.) |
|--------------------|------------------------------|------------------------------|--------------------------------|
|                    |                              |                              | 1                              |
**M-Factor**

propane-1-thiol  
M-Factor (Acute Aquat. Tox.) 10

M-Factor (Chron. Aquat. Tox.) 10

**Toxicity to bacteria**

Isopropyl Mercaptan  
EC50: 880.5 mg/l  
Exposure time: 3 h  
Respiration inhibition  
Method: OECD Test Guideline 209

n-Propyl Mercaptan  
EC50: 880.5 mg/l  
Exposure time: 3 h  
Respiration inhibition  
Method: OECD Test Guideline 209  
Information given is based on data obtained from similar substances.

**Biodegradability**

Expected to be biodegradable

**Elimination information (persistence and degradability)**

**Bioaccumulation**

t-Butyl Mercaptan  
Bioconcentration factor (BCF): 12  
Bioaccumulation is unlikely.

Isopropyl Mercaptan  
This material is not expected to bioaccumulate.

n-Propyl Mercaptan  
This material is not expected to bioaccumulate.

**Mobility**

t-Butyl Mercaptan  
The product will be dispersed amongst the various environmental compartments (soil/ water/ air).

Isopropyl Mercaptan  
Disperses rapidly in air.

n-Propyl Mercaptan  
Disperses rapidly in air.

**Results of PBT assessment**

t-Butyl Mercaptan  
Non-classified PBT substance, Non-classified vPvB substance

Isopropyl Mercaptan  
Non-classified PBT substance, Non-classified vPvB substance

n-Propyl Mercaptan  
Non-classified PBT substance, Non-classified vPvB substance

**Additional ecological information**

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

**Ecotoxicology Assessment**
Short-term (acute) aquatic hazard
- t-Butyl Mercaptan: Toxic to aquatic life.
- Isopropyl Mercaptan: Very toxic to aquatic life.
- n-Propyl Mercaptan: Very toxic to aquatic life.

Long-term (chronic) aquatic hazard
- t-Butyl Mercaptan: Toxic to aquatic life with long lasting effects.
- Isopropyl Mercaptan: Very toxic to aquatic life with long lasting effects.
- n-Propyl Mercaptan: Very toxic to aquatic life with long lasting effects.

SECTION 13: Disposal considerations

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

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)
UN3336, MERCAPTANS, LIQUID, FLAMMABLE, N.O.S., (TERTIARY BUTYL MERCAPTAN, ISOPROPYL MERCAPTAN), 3, II

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)
UN3336, MERCAPTANS, LIQUID, FLAMMABLE, N.O.S., (TERTIARY BUTYL MERCAPTAN, ISOPROPYL MERCAPTAN), 3, II, (-18°C), MARINE POLLUTANT, (TERTIARY BUTYL MERCAPTAN), 3, II, (-18°C), MARINE POLLUTANT, (TERTIARY BUTYL MERCAPTAN), 3, II.
SAFETY DATA SHEET

Scentinel® E Gas Odorant

Version 2.1

Revision Date 2020-03-09

SDS Number:100000013401

17/20

MERCAPTAN, ISOPROPYL MERCAPTAN)

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)
UN3336, MERCAPTANS, LIQUID, FLAMMABLE, N.O.S., (TERTIARY BUTYL MERCAPTAN, ISOPROPYL MERCAPTAN), 3, II

ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))
UN3336, MERCAPTANS, LIQUID, FLAMMABLE, N.O.S., (TERTIARY BUTYL MERCAPTAN, ISOPROPYL MERCAPTAN), 3, II, (D/E), ENVIRONMENTALLY HAZARDOUS, (TERTIARY BUTYL MERCAPTAN, ISOPROPYL MERCAPTAN)

RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))
UN3336, MERCAPTANS, LIQUID, FLAMMABLE, N.O.S., (TERTIARY BUTYL MERCAPTAN, ISOPROPYL MERCAPTAN), 3, II, ENVIRONMENTALLY HAZARDOUS, (TERTIARY BUTYL MERCAPTAN, ISOPROPYL MERCAPTAN)

ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)
UN3336, MERCAPTANS, LIQUID, FLAMMABLE, N.O.S., (TERTIARY BUTYL MERCAPTAN, ISOPROPYL MERCAPTAN), 3, II, ENVIRONMENTALLY HAZARDOUS

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

SECTION 15: Regulatory information

National legislation

SARA 311/312 Hazards : Flammable (gases, aerosols, liquids, or solids)
Respiratory or skin sensitization

EPCRA - EMERGENCY PLANNING COMMUNITY RIGHT - TO – KNOW

CERCLA Reportable Quantity : This material does not contain any components with a CERCLA RQ.

SARA 302 Reportable Quantity : This material does not contain any components with a SARA 302 RQ.

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

SARA 304 Reportable Quantity : This material does not contain any components with a section 304 EHS RQ.
SARA 313 Components: 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.

Clean Air Act

Ozone-Depletion Potential: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC’s (40 CFR 60.489).

US State Regulations

Massachusetts Right To Know: n-Propyl Mercaptan - 107-03-9
t-Butyl Mercaptan - 75-66-1
Isopropyl Mercaptan - 75-33-2

Pennsylvania Right To Know: t-Butyl Mercaptan - 75-66-1

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

Notification status

Europe REACH: This mixture contains only ingredients which have been registered according to Regulation (EU) No. 1907/2006 (REACH).

Switzerland CH INV: On the inventory, or in compliance with the inventory
United States of America (USA) TSCA: On or in compliance with the active portion of the TSCA inventory
Canada DSL: All components of this product are on the Canadian DSL
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           : A substance(s) in this product was not registered, notified to be registered, or exempted from registration by CPChem according to K-REACH regulations. Importation or manufacture of this product is still permitted provided the Korean Importer of Record has themselves notified the substance.

Philippines  PICCS    : On the inventory, or in compliance with the inventory  
China  IECSC        : On the inventory, or in compliance with the inventory  
Taiwan  TCSI        : On the inventory, or in compliance with the inventory  

SECTION 16: Other information

NFPA Classification  : Health Hazard: 2  
                      : Fire Hazard: 3  
                      : Reactivity Hazard: 0

Further information

Legacy SDS Number  : 93850

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.

<table>
<thead>
<tr>
<th>Key or legend to abbreviations and acronyms used in the safety data sheet</th>
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