SAFETY DATA SHEET

n- Butyl Mercaptan

Version 1.10
Revision Date 2019-10-09

according to GB/T 16483 and GB/T 17519

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

Product information

Product Name : n- Butyl Mercaptan
Material : 1078953, 1021482, 1021487, 1021492, 1021491, 1021490, 1021489, 1021488, 1021483, 1021481, 1024804, 1024805, 1021486, 1021485, 1027453

Use : Chemical intermediate

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

Local : Chevron Phillips Chemicals (Shanghai) Corporation
Room 1810-1812, Shanghai Mart,
2299 Yan An Road (W),
Shanghai, PRC 200336

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

SECTION 2: Hazards identification

Classification of the substance or mixture
GHS Classification and Labelling: Follow GB 13690, GB 15258 and GB 30000.2 to GB 30000.29 (GHS 2011)

SDS Number:100000013394
Emergency Overview

**Danger**

**Form:** Liquid  **Physical state:** Liquid  **Color:** Clear  **odor:** Repulsive

**Hazards:** Highly flammable liquid and vapor. Harmful if swallowed. Causes eye irritation. May cause an allergic skin reaction. Suspected of damaging fertility or the unborn child. May cause damage to organs. May cause respiratory irritation. May cause drowsiness or dizziness. May be harmful if swallowed and enters airways. Very toxic to aquatic life. Very toxic to aquatic life with long lasting effects.

**Classification**

- Flammable liquids, Category 2
- Acute toxicity, Category 4, Oral
- Serious eye damage/eye irritation, Category 2B
- Skin sensitization, Category 1
- Reproductive toxicity, Category 2
- Specific target organ toxicity - single exposure, Category 2
- Specific target organ toxicity - single exposure, Category 3,
  respiratory tract irritation, Narcotic effects
- Aspiration hazard, Category 2
- Short-term (acute) aquatic hazard, Category 1
- Long-term (chronic) aquatic hazard, Category 1

**Labeling**

**Symbol(s):**

- Fire
- Person
- Exclamation
- Marine life

**Signal Word:** Danger

**Hazard Statements:**

- H225: Highly flammable liquid and vapor.
- H302: Harmful if swallowed.
- H305: May be harmful if swallowed and enters airways.
- H317: May cause an allergic skin reaction.
- H320: Causes eye irritation.
- H335: May cause respiratory irritation.
- H336: May cause drowsiness or dizziness.
- H361: Suspected of damaging fertility or the unborn child.
- H371: May cause damage to organs.
- H410: Very toxic to aquatic life with long lasting effects.

**Precautionary Statements:**

**Prevention:**

- P201: Obtain special instructions before use.
- P202: Do not handle until all safety precautions have been read and understood.
- 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.
SAFETY DATA SHEET

n- Butyl Mercaptan

Version 1.10

Revision Date 2019-10-09

P264: Wash skin thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.
P271: Use only outdoors or in a well-ventilated area.
P272: Contaminated work clothing should not be allowed out of the workplace.
P273: Avoid release to the environment.
P280: Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:
P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P312: IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P311: IF exposed or concerned: Call a POISON CENTER/doctor.
P331: Do NOT induce vomiting.
P333 + P313: If skin irritation or rash occurs: Get medical advice/ attention.
P337 + P313: If eye irritation persists: Get medical advice/ attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use dry sand, dry chemical or alcohol-resistent foam to extinguish.
P391: Collect spillage.

Storage:
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.
P403 + P235: Store in a well-ventilated place. Keep cool.
P405: Store locked up.

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

SECTION 3: Composition/information on ingredients

Synonyms:
Thiobutyl Alcohol
1-Butanethiol
NBM
Normal Butyl Mercaptan
Butyl Mercaptan

Molecular formula: C4H10S

SDS Number: 100000013394 3/17
**SAFETY DATA SHEET**

**n- Butyl Mercaptan**

Version 1.10

Revision Date 2019-10-09

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No. / EINECS-No.</th>
<th>Concentration [wt%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>n-Butyl Mercaptan</td>
<td>109-79-5</td>
<td>98.5 - 100</td>
</tr>
<tr>
<td>sec-butyl Mercaptan</td>
<td>513-53-1</td>
<td>0 - 1.5</td>
</tr>
<tr>
<td>t-Butyl Mercaptan</td>
<td>75-66-1</td>
<td>0 - 1</td>
</tr>
<tr>
<td>t-Amyl Mercaptan</td>
<td>1679-09-0</td>
<td>0 - 0.1</td>
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</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. Material may produce a serious, potentially fatal pneumonia if swallowed or vomited.

**If inhaled**

If unconscious, place in recovery position and seek medical advice. If symptoms persist, call a physician.

**In case of skin contact**

If on skin, rinse well with water. If on clothes, remove clothes.

**In case of eye contact**

Flush eyes with water as a precaution. 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. Take victim immediately to hospital.

**SECTION 5: Firefighting measures**

**Flash point**

3.3 °C (37.9 °F)

Method: ASTM D - 1310

**Autoignition temperature**

272 °C (522 °F)

estimated

**Suitable extinguishing media**

Alcohol-resistant foam. Carbon dioxide (CO2). Dry chemical.

**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. Take necessary action to avoid static electricity.

SDS Number: 100000013394 4/17
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.

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### 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).

---

### 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. 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.

#### 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.

**Use**: Chemical intermediate
SAFETY DATA SHEET

n-Butyl Mercaptan

Version 1.10

Revision Date 2019-10-09

SECTION 8: Exposure controls/personal protection

Ingredients with workplace control parameters

Chevron Phillips Chemical Company LP

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

CN

<table>
<thead>
<tr>
<th>Components</th>
<th>Basis</th>
<th>Control parameters</th>
<th>Note</th>
</tr>
</thead>
<tbody>
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<td>n-Butyl Mercaptan</td>
<td>GBZ 2.1-2007</td>
<td>PC-TWA 2 mg/m³</td>
<td></td>
</tr>
</tbody>
</table>

Immediately Dangerous to Life or Health Concentrations (IDLH)

<table>
<thead>
<tr>
<th>Substance name</th>
<th>CAS-No.</th>
<th>Control parameters</th>
<th>Update</th>
</tr>
</thead>
<tbody>
<tr>
<td>n-Butyl Mercaptan</td>
<td>109-79-5</td>
<td></td>
<td>2002-04-30</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 workplace 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 according to the amount and concentration of the dangerous substance at the work place. 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.
## SECTION 9: Physical and chemical properties

### Information on basic physical and chemical properties

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

#### Safety data
- **Flash point**: 3.3 °C (37.9 °F)  
  Method: ASTM D - 1310
- **Lower explosion limit**: 1.4 %(V)
- **Upper explosion limit**: 11.3 %(V)
- **Oxidizing properties**: no
- **Autoignition temperature**: 272 °C (522 °F)  
  estimated
- **Molecular formula**: C4H10S
- **Molecular weight**: 90.2 g/mol
- **pH**: Not applicable
- **Freezing point**: -115 °C (-175 °F)
- **Pour point**: No data available
- **Boiling point/boiling range**: 96 - 110 °C (205 - 230 °F)
- **Vapor pressure**: 1.60 PSI  
  at 38 °C (100 °F)
- **Relative density**: 0.842  
  at 15.6 °C (60.1 °F)
- **Density**: 840 g/l
- **Water solubility**: Negligible
- **Partition coefficient: n-octanol/water**: No data available
- **Viscosity, dynamic**: 0.497 cP
- **Relative vapor density**: 2  
  (Air = 1.0)
- **Evaporation rate**: 1
- **Percent volatile**: > 99 %

SDS Number: 100000013394
SECTION 10: Stability and reactivity

Reactivity
- Stable under recommended storage conditions.

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
- Heat, flames and sparks.

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

Hazardous decomposition products
- Carbon oxides
- Sulfur oxides

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

SECTION 11: Toxicological information

**n-Butyl Mercaptan**

Acute oral toxicity
- Acute toxicity estimate: 1,523 mg/kg
  - Method: Calculation method

Acute inhalation toxicity
- n-Butyl Mercaptan
  - LC50: 22.3 mg/l
  - Exposure time: 4 h
  - Species: Rat
  - Test atmosphere: dust/mist

- sec-butyl Mercaptan
  - LC50: 98.3 mg/l
  - Exposure time: 4 h
  - Species: Rat
  - Sex: male and female
  - Test atmosphere: vapor
  - Information given is based on data obtained from similar substances.
### n-Butyl Mercaptan

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

- n-Butyl Mercaptan: 81.9 mg/l  
  Exposure time: 4 h  
  Species: Rat  
  Sex: male  
  Test atmosphere: vapor  
  Method: OECD Test Guideline 403

- t-Butyl Mercaptan: 60.9 mg/l  
  Exposure time: 4 h  
  Species: Mouse  
  Sex: male  
  Test atmosphere: vapor  
  Method: OECD Test Guideline 403

**Acute dermal toxicity**
- sec-butyl Mercaptan: LD50: > 2,000 mg/kg  
  Species: Rat

**Skin irritation**
- n-Butyl Mercaptan: May cause skin irritation and/or dermatitis.

**Eye irritation**
- n-Butyl Mercaptan: Vapors may cause irritation to the eyes, respiratory system and the skin.

**Sensitization**
- n-Butyl Mercaptan: Causes sensitization.

### Repeated dose toxicity
- n-Butyl Mercaptan:  
  Species: Rat  
  Application Route: Inhalation  
  Dose: 0, 9, 70, 150 ppm  
  Exposure time: 13 wk  
  Number of exposures: 6 h/d, 5 d/wk  
  NOEL: 9 ppm  
  Lowest observable effect level: 70 ppm

- sec-butyl Mercaptan:  
  Species: Rat, male and female  
  Sex: male and female  
  Application Route: Inhalation  
  Exposure time: 13 wks  
  Number of exposures: 6 hrs/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 Guideline 413  
  Target Organs: Blood, Liver, Kidney, Upper respiratory tract

- t-Butyl Mercaptan:  
  Species: Rat, Male and female  
  Sex: Male and female  
  Application Route: Inhalation
n-Butyl Mercaptan

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.

Genotoxicity in vitro

n-Butyl Mercaptan: Test Type: Ames test
Result: negative

Test Type: Mouse lymphoma assay
Result: Ambiguous

Test Type: Sister Chromatid Exchange Assay
Result: negative

t-Butyl Mercaptan: Test Type: Mouse lymphoma assay
Metabolic activation: with and without metabolic activation
Result: negative

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

Test Type: Ames test
Metabolic activation: with and without metabolic activation
Result: negative

Genotoxicity in vivo

t-Butyl Mercaptan: Test Type: Mouse micronucleus assay
Species: Mouse
Dose: 1250, 2500, 5000 mg/kg
Method: Mutagenicity (micronucleus test)
Result: negative
Reproductive toxicity

sec-butyl Mercaptan

Species: Rat  
Sex: male and female  
Application Route: oral gavage  
Dose: 10, 50, 200 mg/kg bw/d  
Number of exposures: Daily  
Test period: 42-50 days  
Method: OECD Guideline 422  
NOAEL Parent: 200 mg/kg  
NOAEL F1: 50 mg/kg  
Information given is based on data obtained from similar substances.

t-Butyl Mercaptan

Species: Rat  
Sex: male and female  
Application Route: oral gavage  
Dose: 10, 50, 200 mg/kg bw/day  
Number of exposures: Daily  
Test period: 42-53 days  
Method: OECD Guideline 422  
NOAEL Parent: 200 mg/kg bw/day  
NOAEL F1: 50 mg/kg bw/day  
No adverse effects expected

Developmental Toxicity

n-Butyl Mercaptan

Species: Rat  
Application Route: Inhalation  
Dose: 0, 10, 68, 152 ppm  
Number of exposures: 6 h/d  
Test period: GD 6-19  
NOAEL Teratogenicity: > 152 ppm  
NOAEL Maternal: > 152 ppm  

Species: Mouse  
Application Route: Inhalation  
Dose: 0, 10, 68, 152 ppm  
Number of exposures: 6 h/d  
Test period: GD 6-16  
NOAEL Maternal: 10 ppm

sec-butyl Mercaptan

Species: Rat  
Application Route: Inhalation  
Dose: 11, 99, 195 ppm  
Exposure time: GD 6-16  
Number of exposures: 6 hrs/d  
Method: OECD Guideline 414  
NOAEL Teratogenicity: > = 195 ppm  
NOAEL Maternal: > = 195 ppm  
Information given is based on data obtained from similar substances.
### n- Butyl Mercaptan

Species: Mouse  
Application Route: Inhalation  
Dose: 11, 99, 195 ppm  
Exposure time: GD 6-16  
Number of exposures: 6 hrs/d  
Method: OECD Guideline 414  
NOAEL Teratogenicity: $> = 195$ ppm  
NOAEL Maternal: $> = 195$ ppm  
Information given is based on data obtained from similar substances.

### 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

**n- Butyl Mercaptan**  
**Aspiration toxicity**: May be harmful if swallowed and enters airways.

**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

**n- Butyl Mercaptan**  
**Further information**: Solvents may degrease the skin.

### SECTION 12: Ecological information

**Toxicity to fish**

n-Butyl Mercaptan  
LC50: 2.4 mg/l  
Exposure time: 96 h
n- Butyl Mercaptan

Species: Oncorhynchus mykiss (rainbow trout)
Information given is based on data obtained from similar substances.

sec-butyl Mercaptan
LC50: 8.5 mg/l
Exposure time: 96 h
Species: Oncorhynchus mykiss (rainbow trout)
static test Analytical monitoring: yes
Method: OECD Test Guideline 203

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

Toxicity to daphnia and other aquatic invertebrates

n-Butyl Mercaptan
EC50: 0.38 mg/l
Exposure time: 48 h
Species: Daphnia magna (Water flea)
Information given is based on data obtained from similar substances.

EC50: 0.020 mg/l
Exposure time: 48 h
Species: Daphnia magna (Water flea)
Immobilization Method: OECD Test Guideline 202

sec-butyl Mercaptan
0.56 mg/l
Exposure time: 48 h
Species: Daphnia magna (Water flea)
Immobilization Method: OECD Test Guideline 202
Information refers to the main ingredient.

t-Butyl Mercaptan
EC50: 6.7 mg/l
Exposure time: 48 h
Species: Daphnia magna (Water flea)
static test Method: OECD Test Guideline 202

Toxicity to algae

n-Butyl Mercaptan
EC50: 3.0 mg/l
Exposure time: 96 h
Species: Selenastrum capricornutum (algae)
Information given is based on data obtained from similar substances.

EC50: 0.49 mg/l
Exposure time: 72 h
Species: Pseudokirchneriella subcapitata (microalgae)
Growth inhibition Method: OECD Test Guideline 201

sec-butyl Mercaptan
EC50: 3.4 mg/l
Exposure time: 72 h
Species: Pseudokirchneriella subcapitata (green algae)
Growth inhibition Method: OECD Test Guideline 201

t-Butyl Mercaptan
EC50: 24 mg/l
n- Butyl Mercaptan

Exposure time: 72 h
Species: Pseudokirchneriella subcapitata (green algae)
Method: OECD Test Guideline 201

M-Factor
butane-2-thiol : M-Factor (Acute Aquat. Tox.) 1
M-Factor (Chron. Aquat. Tox.) 1

Biodegradability : Expected to be biodegradable

Elimination information (persistence and degradability)

Bioaccumulation

Bioconcentration factor (BCF): 12
Bioaccumulation is unlikely.

Mobility

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

Results of PBT assessment
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 with long lasting effects.

Ecotoxicology Assessment

Short-term (acute) aquatic hazard
n-Butyl Mercaptan : Very toxic to aquatic life.
sec-butyl Mercaptan : Very toxic to aquatic life.
t-Butyl Mercaptan : Toxic to aquatic life.

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

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)
UN2347, BUTYL MERCAPTAN, 3, II

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)
UN2347, BUTYL MERCAPTAN, 3, II, (3.3 °C), MARINE POLLUTANT, (N- BUTYL MERCAPTAN)

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)
UN2347, BUTYL MERCAPTAN, 3, II

ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))
UN2347, BUTYL MERCAPTAN, 3, II, (D/E), ENVIRONMENTALLY HAZARDOUS, (N- BUTYL MERCAPTAN)

RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))
UN2347, BUTYL MERCAPTAN, 3, II, ENVIRONMENTALLY HAZARDOUS, (N- BUTYL MERCAPTAN)

ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)
UN2347, BUTYL MERCAPTAN, 3, II, ENVIRONMENTALLY HAZARDOUS, (N- BUTYL MERCAPTAN)
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

SECTION 15: Regulatory information

Classification and Labeling of Commonly Used Dangerous Chemical Substances:

Primary label: Combustible Liquid.

Notification status:
- Europe REACH: 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: 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: 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

Other regulations:
- Provisions on the Safe Use of Chemicals at Workplace, Law on the Prevention and Control of Occupational Diseases, Fire Protection
- Law Regulations on Occupational Labor Protection in the at workplaces where Toxic Substances Are Used

SECTION 16: Other information

Further information

Legacy SDS Number: 47670

Local emergency contact number: 0532-83889090

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
n- Butyl Mercaptan

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.

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

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACGIH</td>
<td>American Conference of Government Industrial Hygienists</td>
</tr>
<tr>
<td>LD50</td>
<td>Lethal Dose 50%</td>
</tr>
<tr>
<td>AICS</td>
<td>Australia, Inventory of Chemical Substances</td>
</tr>
<tr>
<td>LOAEL</td>
<td>Lowest Observed Adverse Effect Level</td>
</tr>
<tr>
<td>DSL</td>
<td>Canada, Domestic Substances List</td>
</tr>
<tr>
<td>NFPA</td>
<td>National Fire Protection Agency</td>
</tr>
<tr>
<td>NDSL</td>
<td>Canada, Non-Domestic Substances List</td>
</tr>
<tr>
<td>NIOSH</td>
<td>National Institute for Occupational Safety &amp; Health</td>
</tr>
<tr>
<td>CNS</td>
<td>Central Nervous System</td>
</tr>
<tr>
<td>NTP</td>
<td>National Toxicology Program</td>
</tr>
<tr>
<td>CAS</td>
<td>Chemical Abstract Service</td>
</tr>
<tr>
<td>NOAEL</td>
<td>No Observable Adverse Effect Level</td>
</tr>
<tr>
<td>EC50</td>
<td>Effective Concentration</td>
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<tr>
<td>NOEC</td>
<td>No Observed Effect Concentration</td>
</tr>
<tr>
<td>EGEST</td>
<td>EOSCA Generic Exposure Scenario Tool</td>
</tr>
<tr>
<td>OSHA</td>
<td>Occupational Safety &amp; Health Administration</td>
</tr>
<tr>
<td>EOSCA</td>
<td>European Oilfield Specialty Chemicals Association</td>
</tr>
<tr>
<td>PEL</td>
<td>Permissible Exposure Limit</td>
</tr>
<tr>
<td>EINECS</td>
<td>European Inventory of Existing Chemical Substances</td>
</tr>
<tr>
<td>PICCS</td>
<td>Philippines Inventory of Commercial Chemical Substances</td>
</tr>
<tr>
<td>MAK</td>
<td>Germany Maximum Concentration Values</td>
</tr>
<tr>
<td>PRNT</td>
<td>Presumed Not Toxic</td>
</tr>
<tr>
<td>GHS</td>
<td>Globally Harmonized System</td>
</tr>
<tr>
<td>RCRA</td>
<td>Resource Conservation Recovery Act</td>
</tr>
<tr>
<td>&gt;=</td>
<td>Greater Than or Equal To</td>
</tr>
<tr>
<td>STEL</td>
<td>Short-term Exposure Limit</td>
</tr>
<tr>
<td>IC50</td>
<td>Inhibition Concentration 50%</td>
</tr>
<tr>
<td>SARA</td>
<td>Superfund Amendments and Reauthorization Act.</td>
</tr>
<tr>
<td>IARC</td>
<td>International Agency for Research on Cancer</td>
</tr>
<tr>
<td>TLV</td>
<td>Threshold Limit Value</td>
</tr>
<tr>
<td>IECSC</td>
<td>Inventory of Existing Chemical Substances in China</td>
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<tr>
<td>TWA</td>
<td>Time Weighted Average</td>
</tr>
<tr>
<td>ENCS</td>
<td>Japan, Inventory of Existing and New Chemical Substances</td>
</tr>
<tr>
<td>TSCA</td>
<td>Toxic Substance Control Act</td>
</tr>
<tr>
<td>KECI</td>
<td>Korea, Existing Chemical Inventory</td>
</tr>
<tr>
<td>UVCB</td>
<td>Unknown or Variable Composition, Complex Reaction Products, and Biological Materials</td>
</tr>
<tr>
<td>&lt;=</td>
<td>Less Than or Equal To</td>
</tr>
<tr>
<td>WHMIS</td>
<td>Workplace Hazardous Materials Information System</td>
</tr>
<tr>
<td>LC50</td>
<td>Lethal Concentration 50%</td>
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