**Tertiary Butyl Mercaptan**

**Section 1: Identification of the substance/mixture and of the company/undertaking**

**Product information**

- **Product Name**: Tertiary Butyl Mercaptan
- **Material**: 1069500, 1086416, 1086415, 1070007, 1064730, 1021473, 1021470, 1017940, 1017940, 1036143, 1024807, 1021472, 1021471, 1024806, 1021469, 1028495, 1021474, 1027458, 1029711, 1017329, 1021468

**Use**: Chemical intermediate, Odorant

**Company**: Chevron Phillips Chemical Company LP

Specialty Chemicals

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

**Local emergency contact number**: 0532-83889090

**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**

SDS Number: 100000013356
Tertiary Butyl Mercaptan

GHS Classification and Labeling: Follow GB 13690, GB 15258 and GB 30000.2 to GB 30000.29 (GHS 2011)

Emergency Overview

**Danger**
- **Form:** Liquid
- **Physical state:** Liquid
- **Color:** clear
- **Odor:** Repulsive

**Hazards:**
- Highly flammable liquid and vapor. May cause an allergic skin reaction. May be harmful if swallowed and enters airways. Toxic to aquatic life. Toxic to aquatic life with long lasting effects.

**Classification**
- Flammable liquids, Category 2
- Skin sensitization, Category 1
- Aspiration hazard, Category 2
- Acute aquatic toxicity, Category 2
- Chronic aquatic toxicity, Category 2

**Labeling**
- **Symbol(s):**
  - Flammable
  - Health hazard
  - Corrosive
  --inhaling

- **Signal Word:** Danger

**Hazard Statements**
- H225: Highly flammable liquid and vapor.
- H305: May be harmful if swallowed and enters airways.
- H317: May cause an allergic skin reaction.
- H411: 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.
  - 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.
  - P272: Contaminated work clothing must not be allowed out of the workplace.
  - P273: Avoid release to the environment.
  - P280: Wear protective gloves/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.
  - P312: Call a POISON CENTER/doctor if you feel unwell.
  - P313: Do NOT induce vomiting.
  - P333 + P313: If skin irritation or rash occurs: 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-resistant foam to extinguish.
P391: Collect spillage.

Storage:
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:
t-Butyl Mercaptan
tert-Butanethiol
2-Methyl Propane-2-Thiol
TBM
TC4SH
tert-Butyl Mercaptan

Molecular formula: C4H10S

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No. / EINECS-No.</th>
<th>Concentration [wt%]</th>
</tr>
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<tr>
<td>t-Butyl Mercaptan</td>
<td>75-66-1</td>
<td>100</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. Symptoms of poisoning may appear several hours later. Do not leave the victim unattended.

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. Do NOT induce vomiting. Do not give milk or alcoholic beverages. 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: -26 °C (-15 °F) estimated
Tertiary Butyl Mercaptan

Autoignition temperature : No data available

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

Unsuitable extinguishing media : High volume water jet.

Specific hazards during fire fighting : 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 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

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.
Tertiary Butyl Mercaptan

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.

SECTION 8: Exposure controls/personal protection

Ingredients with workplace control parameters

Chevron Phillips Chemical Company LP

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

Personal protective equipment

Hand protection : The suitability for a specific workplace should be discussed with the producers of the protective gloves.

Eye protection : Eye wash bottle with pure water. Tightly fitting safety goggles.

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

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

SDS Number:100000013356
Safety data

- **Flash point**: -26 °C (-15 °F) estimated
- **Lower explosion limit**: No data available
- **Upper explosion limit**: No data available
- **Oxidizing properties**: no
- **Autoignition temperature**: No data available
- **Molecular formula**: C4H10S
- **Molecular weight**: 90.2 g/mol
- **pH**: Not applicable
- **Pour point**: No data available
- **Boiling point/boiling range**: 63 - 65 °C (145 - 149 °F)
- **Vapor pressure**: 5.90 PSI 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
- **Relative vapor density**: 3 (Air = 1.0)
- **Evaporation rate**: 1
- **Percent volatile**: > 99 %

SECTION 10: Stability and reactivity

- **Possibility of hazardous reactions**: Heat, flames and sparks.
- **Hazardous decomposition products**: Carbon oxides, Sulfur oxides

- **Other data**: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Tertiary Butyl Mercaptan

SECTION 11: Toxicological information

**Acute oral toxicity**

- **t-Butyl Mercaptan**
  - LD50: 4,729 mg/kg
  - Species: Rat
  - Sex: male

**Acute inhalation toxicity**

- **t-Butyl Mercaptan**
  - LC50: 26643 ppm
    - Exposure time: 4 h
    - Species: Rat
    - Sex: male and female
    - Test atmosphere: vapor
    - Method: OECD Test Guideline 403

  - LC50: 22200 ppm
    - Exposure time: 4 h
    - Species: Rat
    - Sex: male
    - Test atmosphere: vapor
    - Method: OECD Test Guideline 403

  - LC50: 16500 ppm
    - Exposure time: 4 h
    - Species: Mouse
    - Sex: male
    - Test atmosphere: vapor
    - Method: OECD Test Guideline 403

**Tertiary Butyl Mercaptan Skin irritation**

: No skin irritation.

**Tertiary Butyl Mercaptan Eye irritation**

: Vapors may cause irritation to the eyes, respiratory system and the skin.

**Tertiary Butyl Mercaptan 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.

Reproductive toxicity

**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

**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
Tertiary Butyl Mercaptan

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

**Tertiary 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

**Tertiary Butyl Mercaptan**
**Further information**: Symptoms of overexposure are dizziness, headache, tiredness, nausea, unconsciousness, cessation of breathing. 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

**Toxicity to daphnia and other aquatic invertebrates**
- 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**
- t-Butyl Mercaptan:
  - EC50: 24 mg/l
  - Exposure time: 72 h
  - Species: Pseudokirchneriella subcapitata (green algae)
  - Method: OECD Test Guideline 201
Bioaccumulation

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

Biodegradability

aerobic

Result: Not readily biodegradable.
6 %
Testing period: 63 d
Method: OECD Test Guideline 301

Ecotoxicology Assessment

Acute aquatic toxicity
t-Butyl Mercaptan : Toxic to aquatic life.

Chronic aquatic toxicity
t-Butyl Mercaptan : Toxic to aquatic life with long lasting effects.

Results of PBT assessment
t-Butyl 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., 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 MERCAPTANS, 3, II

**IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)**
UN2347, BUTYL MERCAPTANS, 3, II, (-26 °C), MARINE POLLUTANT, (TERTIARY 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, (TERTIARY BUTYL MERCAPTAN)

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

**ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)**
UN2347, BUTYL MERCAPTAN, 3, II, ENVIRONMENTALLY HAZARDOUS, (TERTIARY BUTYL MERCAPTAN)

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

**SECTION 15: Regulatory information**

<table>
<thead>
<tr>
<th>Classification and Labeling of Commonly Used Dangerous Chemical Substances</th>
<th>Primary label: Combustible Liquid.</th>
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</thead>
</table>

**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
SECTION 16: Other information

Further information
Legacy SDS Number : 95900

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 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>
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<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>
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<tr>
<td>LOAEL</td>
<td>Lowest Observed Adverse Effect Level</td>
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<tr>
<td>DSL</td>
<td>Canada, Domestic Substances List</td>
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<td>NFPA</td>
<td>National Fire Protection Agency</td>
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<td>NDSL</td>
<td>Canada, Non-Domestic Substances List</td>
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<td>NIOSH</td>
<td>National Institute for Occupational Safety &amp; Health</td>
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<tr>
<td>CNS</td>
<td>Central Nervous System</td>
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<tr>
<td>NTP</td>
<td>National Toxicology Program</td>
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<td>CAS</td>
<td>Chemical Abstract Service</td>
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<td>New Zealand Inventory of Chemicals</td>
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<td>EOSCA Generic Exposure Scenario Tool</td>
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<td>OSHA</td>
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<td>EOSCA</td>
<td>European Oilfield Specialty Chemicals Association</td>
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<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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<tr>
<td>MAK</td>
<td>Germany Maximum Concentration Values</td>
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<td>Globally Harmonized System</td>
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<td>Inhibition Concentration 50%</td>
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<td>SARA</td>
<td>Superfund Amendments and Reauthorization Act</td>
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<td>International Agency for Research on Cancer</td>
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<td>Japan, Inventory of Existing and New Chemical Substances</td>
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<td>TSCA</td>
<td>Toxic Substance Control Act</td>
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<td>Korea, Existing Chemical Inventory</td>
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<td>UVCB</td>
<td>Unknown or Variable Composition, Complex Reaction Products, and Biological Materials</td>
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<td>Workplace Hazardous Materials</td>
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## Tertiary Butyl Mercaptan

### Version 1.6

**Revision Date**: 2017-07-12

<table>
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<tr>
<th>LC50</th>
<th>Lethal Concentration 50%</th>
<th>Information System</th>
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SDS Number:100000013356

13/13