SAFETY DATA SHEET

N-Octyl Mercaptan

Version 1.20

Revision Date 2019-09-09

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

Product information
Product Name: N-Octyl Mercaptan
Material: 1115893, 1086427, 1092079, 1089361, 1086426, 1021507, 1021501, 1021505, 1021503, 1021502, 1021508, 1021506, 1021504, 1024813, 1026777, 1036311, 1021509, 1035162, 1024812, 1033723

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

Local: CHEVRON PHILLIPS CHEMICALS ASIA PTE. LTD.
C/O DONG WOO CORPORATION
#B-2601,JEONGJAIL-RO,
BUNDANG-GU,SEONGNAMI-SI,
GYEONGGI-DO,13557
SOUTH KOREA
Telephone no.: +612-9186-1132

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:100000013889

1/13
SAFETY DATA SHEET

N-Octyl Mercaptan

Version 1.20  Revision Date 2019-09-09

Standards for classification and labeling of chemical substances and material safety data sheet (ministry of employment and labor public notice No. 2016-19) (GHS 2011)

Classification

: Acute toxicity, Category 4, Oral
  Acute toxicity, Category 4, Dermal
  Skin corrosion/irritation, Category 2
  Short-term (acute) aquatic hazard, Category 1
  Long-term (chronic) aquatic hazard, Category 1

Labeling

Symbol(s)

: 

Signal Word : Warning

Hazard Statements

: H302: Harmful if swallowed.
  H312: Harmful in contact with skin.
  H315: Causes skin irritation.
  H400: Very toxic to aquatic life.
  H410: Very toxic to aquatic life with long lasting effects.

Precautionary Statements

Prevention:

P264: Wash the contact area thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.
P273: Avoid release to the environment.
P280: Wear protective gloves/ protective clothing.

Response:

P301 + P312 + P330: IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel unwell. Rinse mouth.
P302 + P352: IF ON SKIN: Wash with plenty of soap and water.
P302 + P352 + P312: IF ON SKIN: Wash with plenty of soap and water. Call a POISON CENTER or doctor/ physician if you feel unwell.
P321: Specific treatment (see supplemental first aid instructions on this label).
P332 + P313: If skin irritation occurs: Get medical advice/ attention.
P361 + P364: Take off immediately all contaminated clothing and wash it before reuse.
P391: Collect spillage.

Disposal:

P501: Dispose of contents and container according to wastes control act.

SECTION 3: Composition/information on ingredients

Synonyms : 1-Octanethiol
            normal-Octyl mercaptan
            NOM

SDS Number:100000013889  2/13
NC8SH

Molecular formula : C8H18S

<table>
<thead>
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<th>Chemical name</th>
<th>CAS-No.</th>
<th>Concentration</th>
<th>KECI Number</th>
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<tbody>
<tr>
<td>n-Octyl Mercaptan</td>
<td>111-88-6</td>
<td>98.5 % - 100%</td>
<td>KE-26627</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. 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. Do NOT induce vomiting. 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**: 69 - 71 °C (156 - 160 °F) at 101.325 kPa
  Method: EU Method A.9
- **Autoignition temperature**: No data available
- **Suitable extinguishing media**: Carbon dioxide (CO2).
- **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**: Do not spray on an open flame or any other incandescent
**N-Octyl Mercaptan**

**SECTION 6: Accidental release measures**

**Personal precautions**
Use personal protective equipment. Ensure adequate ventilation.

**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). Keep in suitable, closed containers for disposal.

**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. Provide sufficient air exchange and/or exhaust in work rooms. 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. Keep away from open flames, hot surfaces and sources of ignition.

**Storage**

**Requirements for storage areas and containers**
No smoking. Keep in a 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**

**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 in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place. Wear as appropriate: Flame retardant protective clothing. Remove and wash contaminated clothing before re-use. Skin should be washed after contact. Footwear protecting against chemicals.

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: Colorless
- Odor: Pungent

**Safety data**
- Flash point: 69 - 71 °C (156 - 160 °F) at 101.325 kPa
  - Method: EU Method A.9
- Lower explosion limit: No data available
## N-Octyl Mercaptan

### Upper explosion limit
- No data available

### Oxidizing properties
- No

### Autoignition temperature
- No data available

### Molecular formula
- C8H18S

### Molecular weight
- 146.32 g/mol

### pH
- Not applicable

### Pour point
- No data available

### Boiling point/boiling range
- 199 °C (390 °F)

### Vapor pressure
- 0.02 PSI
  - at 37.8 °C (100.0 °F)

### Relative density
- 0.85
  - at 16 °C (61 °F)
  - 0.85
  - at 16 °C (61 °F)

### Water solubility
- Negligible

### Partition coefficient: n-octanol/water
- No data available

### Viscosity, kinematic
- 1.04 mm²/s
  - at 40 °C (104 °F)

### Relative vapor density
- 1
  - (Air = 1.0)

### Evaporation rate
- No data available

### 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
# N-Octyl Mercaptan

**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

### Acute oral toxicity

n-Octyl Mercaptan:  
LD50: 2,436 mg/kg  
Species: Rat  
Sex: male and female  
Method: Fixed Dose Method

### Acute inhalation toxicity

n-Octyl Mercaptan:  
LC50: > 0.24 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

n-Octyl Mercaptan:  
LD50: > 1,680 mg/kg  
Species: Rat  
Sex: male and female  
Method: OECD Test Guideline 402

### Skin irritation

n-Octyl Mercaptan: slight irritation. largely based on animal evidence.

### Eye irritation

n-Octyl Mercaptan: slight irritation. largely based on animal evidence.

### Sensitization

n-Octyl Mercaptan: May cause sensitization by skin contact. largely based on animal evidence.

### Repeated dose toxicity
n-Octyl Mercaptan:
Species: Rat, males
Sex: males
Application Route: Oral
Dose: 0, 10, 50, 250 mg/kg
Exposure time: 35 D
Number of exposures: once daily
NOEL: 50 mg/kg
Method: OECD Guideline 422

Species: Rat, females
Sex: females
Application Route: Oral
Dose: 0, 10, 50, 250 mg/kg
Number of exposures: once daily
NOEL: 50 mg/kg
Method: OECD Guideline 422

Genotoxicity in vitro
n-Octyl Mercaptan:
Test Type: Reverse mutation assay
Metabolic activation: with and without metabolic activation
Method: Mutagenicity (Escherichia coli - reverse mutation assay)
Result: negative

Test Type: Chromosome aberration test in vitro
Test system: Human lymphocytes
Metabolic activation: with and without metabolic activation
Result: negative

Test Type: Sister chromatid exchange
Metabolic activation: with and without metabolic activation
Result: negative

Genotoxicity in vivo
n-Octyl Mercaptan:
Test Type: Micronucleus test
Species: Mouse
Method: Mutagenicity (micronucleus test)
Result: negative

Reproductive toxicity
n-Octyl Mercaptan:
Species: Rat
Sex: male
Application Route: Oral diet
Dose: 0, 10, 50, 250 mg/kg
Exposure time: 35 D
Number of exposures: once daily
Method: OECD Guideline 422
NOAEL Parent: 250 mg/kg
NOAEL F1: 250 mg/kg
Species: Rat
Sex: female
Application Route: Oral diet
Dose: 0, 10, 50, 250 mg/kg
Number of exposures: once daily
Method: OECD Guideline 422
NOAEL Parent: 50 mg/kg
NOAEL F1: 250 mg/kg

Developmental Toxicity
n-Octyl Mercaptan: Species: Rat
Application Route: Oral diet
Dose: 0, 10, 50, 250 mg/kg
Number of exposures: once daily
NOAEL Teratogenicity: 250 mg/kg

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

CMR effects
n-Octyl Mercaptan: Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects. Teratogenicity: Animal testing did not show any effects on fetal development. Reproductive toxicity: Animal testing did not show any effects on fertility.

Further information: Solvents may degrease the skin.

Toxicity to fish
n-Octyl Mercaptan: LC50: 0.326 mg/l
Exposure time: 96 h
Species: Oryzias latipes (Orange-red killifish) semi-static test Analytical monitoring: yes Method: OECD Test Guideline 203 Very toxic to fish.

Toxicity to daphnia and other aquatic invertebrates
n-Octyl Mercaptan: 0.0243 mg/l
Exposure time: 48 h

Toxicity to algae

SDS Number: 100000013889
n-Octyl Mercaptan:

Exposure time: 72 h
Species: Pseudokirchneriella subcapitata (microalgae)
semi-static test Analytical monitoring: yes
Method: OECD Test Guideline 201
Very toxic to algae.

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)

n-Octyl Mercaptan:
Exposure time: 21 d
Species: Daphnia magna (Water flea)
Toxic effects on fish and plankton

Biodegradability

n-Octyl Mercaptan:
Result: Not readily biodegradable.
0 %
Testing period: 28 Days
Method: OECD Test Guideline 301
Information given is based on data obtained from similar substances.

Bioaccumulation

n-Octyl Mercaptan:
Bioconcentration factor (BCF): 11.83
Method: QSAR modeled data

Mobility

n-Octyl Mercaptan:
Medium: Soil
Method: Calculation, Mackay Level III Fugacity Model
This product may float or sink in water.

Medium: Water
Method: Calculation, Mackay Level III Fugacity Model
This product may float or sink in water.

Additional ecological information

Ecotoxicology Assessment

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

Long-term (chronic) aquatic hazard
n-Octyl 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.

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)
NA1993, COMBUSTIBLE LIQUID, N.O.S., (N-OCTYL MERCAPTAN), III

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)
UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (N-OCTYL MERCAPTAN), 9, III, (69 - 71 °C), MARINE POLLUTANT, (N-OCTYL MERCAPTAN)

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)
UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (N-OCTYL MERCAPTAN), 9, III

ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))
UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (N-OCTYL MERCAPTAN), 9, III

RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))
UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (N-OCTYL MERCAPTAN), 9, III

ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)
UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (N-OCTYL MERCAPTAN), 9, III
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Other information: n-Octyl Mercaptan, S.T. 1, Cat. X

SECTION 15: Regulatory information

National legislation
Regulation under the Occupational Safety and Health Act
A Material Safety Datasheet (MSDS) for this product is not required according to article 41 of the ISHA.

<table>
<thead>
<tr>
<th>Regulation</th>
<th>Chemical name</th>
<th>Threshold limits</th>
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<tbody>
<tr>
<td>Harmful Substances Prohibited from Manufacturing</td>
<td>Not applicable</td>
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<tr>
<td>Harmful Substances Required Permission for Manufacture</td>
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Act on the Registration and Evaluation, etc. of Chemical Substances, Chemicals Control Act

<table>
<thead>
<tr>
<th>Regulation</th>
<th>Chemical name</th>
<th>Threshold limits</th>
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<tr>
<td>Toxic Chemicals</td>
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<tr>
<td>Prohibited Chemicals</td>
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<tr>
<td>Restricted Chemicals</td>
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<td></td>
</tr>
<tr>
<td>Toxic Release Inventory</td>
<td>Not applicable</td>
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</tbody>
</table>

Dangerous Substances Safety Management Act
Dangerous Substances: Flammable liquids, Type 2 petroleums, Water insoluble liquid
Safety Management Act

Notification status
Europe REACH : On the inventory, or in compliance with the inventory
Switzerland CH INV : On the inventory, or in compliance with the inventory
United States of America (USA) : On or in compliance with the active portion of the TSCA
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 : All substances in this product were registered, notified to be registered, or exempted from registration by CPChem through an Only Representative according to K-REACH regulations. Importation of this product is permitted if the Korean Importer of Record was included on CPChem's notifications or if the Importer of Record themselves notified the substances.
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
Further information

Legacy SDS Number: 76100

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