2-Mercaptoethanol (BME)

Version 2.3 Revision Date 2020-03-09

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	:	2-Mercaptoethanol (BME)
Material	:	1122450, 1122449, 1017944, 1068852, 1088828, 1086429, 1104362, 1093708, 1086428, 1021562, 1024822, 1021565, 1024821, 1021564, 1028369, 1033065, 1028386, 1028385, 1033120
Use	:	Chemical intermediate
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

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 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**: Water white **Odor**: Repulsive

Hazards : Combustible liquid. Toxic if swallowed. Toxic if inhaled. Fatal in contact with skin. Causes skin irritation. Causes serious eye irritation. May cause an allergic skin reaction. Suspected of damaging fertility or the unborn child. May cause damage to organs. May cause damage to organs through prolonged or repeated exposure. Very toxic to aquatic life. Very toxic to aquatic life with long lasting effects.

Classification

: Flammable liquids, Category 4
Acute toxicity, Category 3, Oral
Acute toxicity, Category 3, Inhalation
Acute toxicity, Category 2, Dermal
Skin corrosion/irritation, Category 2
Serious eye damage/eye irritation, Category 2A
Skin sensitization, Category 1
Reproductive toxicity, Category 2
Specific target organ toxicity - single exposure, Category 2
Specific target organ toxicity - repeated exposure, Category 2
Short-term (acute) aquatic hazard, Category 1
Long-term (chronic) aquatic hazard, Category 1

Labeling

Symbol(s) :

Signal Word : Danger

Hazard Statements : H227: Combustible liquid.
H301 + H331: Toxic if swallowed or if inhaled.
H310: Fatal in contact with skin.
H315: Causes skin irritation.
H317: May cause an allergic skin reaction.
H319: Causes serious eye irritation.
H361: Suspected of damaging fertility or the unborn child.
H371: May cause damage to organs.
H373: May cause damage to organs through prolonged or repeated exposure.
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.
P260: Do not breathe dust/fume/gas/mist/vapor/spray.

P262: Do not get in eyes, on skin, or on clothing.
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 + P330: IF SWALLOWED: Immediately call a POISON CENTER/ doctor. Rinse mouth.
P302+P352+P310: IF ON SKIN: Wash with plenty of water. Immediately call a POISON CENTER/doctor.
P304+P340+P311: IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor.
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.
P333 + P313: If skin irritation or rash occurs: Get medical advice/ attention.
P337 + P313: If eye irritation persists: Get medical advice/ attention.
P361+P364: Take off immediately all 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 + 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 : beta-Mercaptoethanol
BME
Thioglycol
2, Mercaptoethanol
2-Hydroxyethyl Mercaptan
2-Mercaptoethanol Pure

Molecular formula : HSCH2CH2OH

Chemical name	CAS-No. / EINECS-No.	Concentration [wt%]
2-Mercaptoethanol	60-24-2	99 - 100

SECTION 4: First aid measures

General advice	:	Move out of dangerous area. Consult a physician. Show this material safety data sheet to the doctor in attendance.
If inhaled	:	If unconscious, place in recovery position and seek medical advice. If symptoms persist, call a physician.
In case of skin contact	:	Take victim immediately to hospital. If on skin, rinse well with water. If on clothes, remove clothes.
In case of eye contact	:	Small amounts splashed into eyes can cause irreversible tissue damage and blindness. In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Continue rinsing eyes during transport to hospital. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.
If swallowed	:	Keep respiratory tract clear. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician. Take victim immediately to hospital.

SECTION 5: Firefighting measures

Flash point	:	68.3°C (154.9°F) Method: Tag closed cup
Autoignition temperature	:	295°C (563°F) estimated
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 protection	:	Do not spray on an open flame or any other incandescent material. Keep away from open flames, hot surfaces and sources of ignition.

SECTION 6: Accidental release measures

Personal precautions	:	Use personal protective equipment.
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. To avoid spills during handling keep bottle on a metal tray. 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	:	Prevent unauthorized access. 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.
Use	:	Chemical intermediate

SECTION 8: Exposure controls/personal protection

Not applicable

Engineering measures

Adequate ventilation to control airborned 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:. Full-Face Supplied-Air Respirator. 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.
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. Personal protection through wearing a tightly closed chemical protection suit and a self-contained breathing apparatus. Remove and wash contaminated clothing before re-use. Skin should be washed after contact. Footwear protecting against chemicals.
Hygiene measures	:	Avoid contact with skin, eyes and clothing. When using do not eat or drink. When using do not smoke. Wash hands before breaks and immediately after handling the product.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Appearance

Form	:	Liquid
Physical state	:	Liquid
Color	:	Water white
Odor	:	Repulsive

Safety data

Flash point	:	68.3°C (154.9°F) Method: Tag closed cup
Lower explosion limit	:	2.3 %(V)
Upper explosion limit	:	18 %(V)
Oxidizing properties	:	No

Autoignition temperature	:	295°C (563°F) estimated
Molecular formula	:	HSCH2CH2OH
Molecular weight	:	No data available
pH	:	Not applicable
Pour point	:	No data available
Freezing point		No data available
Boiling point/boiling range	:	155-160°C (311-320°F)
Vapor pressure	:	5.70 MMHG at 37.8°C (100.0°F)
Relative density	:	1.12 at 15.6 °C (60.1 °F)
Density	:	1.12 G/ML
Partition coefficient: n-octanol/water	:	Pow: 0.56
Viscosity, dynamic	:	3.42 cP
Relative vapor density	:	2.69 (Air = 1.0)
Evaporation rate	:	1
Percent volatile	:	> 99 %

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.

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

SECTION 11: Toxicological information

2-Mercaptoethanol (BME)
Acute oral toxicity : Acute toxicity estimate: 101.01 mg/kg
Method: Calculation method

2-Mercaptoethanol (BME)
Acute inhalation toxicity : Acute toxicity estimate: 631 ppm
Exposure time: 4 h
Test atmosphere: gas
Method: Calculation method

2-Mercaptoethanol (BME)
Acute dermal toxicity : Acute toxicity estimate: 50.51 mg/kg
Method: Calculation method

Skin irritation

2-Mercaptoethanol : Skin irritation

Eye irritation
2-Mercaptoethanol : Irreversible effects on the eye

Sensitization

2-Mercaptoethanol : The product is a skin sensitizer, sub-category 1A.

Repeated dose toxicity

2-Mercaptoethanol : Species: Rat, Male and female
Sex: Male and female
Application Route: oral gavage
Dose: 0. 15, 50, 75 mg/kg
Exposure time: 7 wk
Number of exposures: daily
NOEL: 15 mg/kg
Lowest observable effect level: 50 mg/kg
Method: OECD Guideline 422
Target Organs: Heart, Liver

Genotoxicity in vitro

2-Mercaptoethanol : Test Type: Ames test
Method: Mutagenicity (Escherichia coli - reverse mutation assay)
Result: negative

Test Type: Chromosome aberration test in vitro
Method: OECD Guideline 473
Result: negative

Test Type: Mouse lymphoma assay
Method: OECD Guideline 476
Result: negative

Test Type: Sister Chromatid Exchange Assay
Result: Ambiguous

Genotoxicity in vivo

2-Mercaptoethanol : Test Type: Mouse micronucleus assay
Method: Mutagenicity (micronucleus test)
Result: negative

Reproductive toxicity

2-Mercaptoethanol : Species: Rat
Sex: male
Application Route: oral gavage
Dose: 0. 15, 50, 75 mg/kg
Number of exposures: daily
Test period: 7 wks
Method: OECD Guideline 422
NOAEL Parent: 75 mg/kg

Species: Rat
Sex: female
Application Route: oral gavage
Dose: 0. 15, 50, 75 mg/kg
Number of exposures: daily
Test period: 7 wks
NOAEL Parent: 15 mg/kg

Developmental Toxicity

2-Mercaptoethanol : Species: Rat
Application Route: oral gavage
Dose: 5, 15, 25 mg/kg/bw/d
Exposure time: GD 6-19
Number of exposures: daily
Test period: 20 d
Method: OECD Guideline 414
NOAEL Teratogenicity: 25 mg/kg
NOAEL Maternal: 25 mg/kg
Animal testing did not show any effects on fetal development.

CMR effects

2-Mercaptoethanol : Carcinogenicity: Not available
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: Some evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments.

2-Mercaptoethanol (BME)
Further information : No data available.

SECTION 12: Ecological information

Ecotoxicity effects
Toxicity to fish

2-Mercaptoethanol : LC50: 37 mg/l
Exposure time: 96 h
Species: Leuciscus idus (Golden orfe)

Toxicity to daphnia and other aquatic invertebrates

2-Mercaptoethanol : EC50: 0.4 mg/l
Exposure time: 48 h
Species: Daphnia magna (Water flea)
Method: OECD Test Guideline 202

Toxicity to algae

2-Mercaptoethanol : EC50: 19 mg/l
Exposure time: 72 h
Species: Desmodesmus subspicatus (green algae)
static test Method: OECD Test Guideline 201

M-Factor
2-mercaptoethanol : M-Factor (Acute Aquat. Tox.) 1

Toxicity to bacteria

2-Mercaptoethanol : EC50: 125 mg/l
Exposure time: 17 h
Growth rate
Species: Pseudomonas putida

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)

2-Mercaptoethanol : NOEC: 0.0624 mg/l
Exposure time: 21 d
Species: Daphnia magna (Water flea)
static renewal
Method: OECD Test Guideline 211

Biodegradability

2-Mercaptoethanol : Result: Not readily biodegradable.
< 10 %
Method: OECD Test Guideline 301

Elimination information (persistence and degradability)

Bioaccumulation

2-Mercaptoethanol : This material is not expected to bioaccumulate.

Mobility : Medium: Soil
No data available

Results of PBT assessment
2-Mercaptoethanol : Non-classified PBT substance, Non-classified vPvB substance

Additional ecological information : Very toxic to aquatic life., Toxic to aquatic life with long lasting effects.

Ecotoxicology Assessment

Short-term (acute) aquatic hazard
2-Mercaptoethanol : Very toxic to aquatic life.

Long-term (chronic) aquatic hazard
2-Mercaptoethanol : 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)
UN2966, THIOGLYCOL, 6.1, II

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)
UN2966, THIOGLYCOL, 6.1, II, (68.3°C), MARINE POLLUTANT, (THIOGLYCOL)

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)
UN2966, THIOGLYCOL, 6.1, II

ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))
UN2966, THIOGLYCOL, 6.1, II, (D/E), ENVIRONMENTALLY HAZARDOUS, (THIOGLYCOL)

RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))
UN2966, THIOGLYCOL, 6.1, II, ENVIRONMENTALLY HAZARDOUS, (THIOGLYCOL)

ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)
UN2966, THIOGLYCOL, 6.1, II, ENVIRONMENTALLY HAZARDOUS, (THIOGLYCOL)

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

SECTION 15: Regulatory information

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) 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	:	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

SECTION 16: Other information

Further information

Legacy SDS Number : 26290

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	UVCB	Unknown or Variable Composition,

	Inventory		Complex Reaction Products, and Biological Materials
<=	Less Than or Equal To	WHMIS	Workplace Hazardous Materials Information System
LC50	Lethal Concentration 50%		