SAFETY DATA SHEETS

According to Globally Harmonized System of Classification and Labelling of Chemicals (GHS) - Sixth revised edition

Version: 1.0

Creation Date: Aug 16, 2017

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1. Identification

1.1 GHS Product identifier

Product name	methanethiol

1.2 Other means of identification

Product number	-
Other names	MERCAPTOMETHYLE

1.3 Recommended use of the chemical and restrictions on use

Identified uses	For industry use only. Volatile organic compounds
Uses advised against	no data available

2. Hazard identification

2.1 Classification of the substance or mixture

Gases under pressure: Compressed gas

Flammable gases, Category 1

Acute toxicity - Inhalation, Category 3

Hazardous to the aquatic environment, short-term (Acute) - Category Acute 1

Hazardous to the aquatic environment, long-term (Chronic) - Category Chronic 1

2.2 GHS label elements, including precautionary statements

Pictogram(s)	
Signal word	Danger
Hazard statement(s)	H220 Extremely flammable gas
	H331 Toxic if inhaled
	H410 Very toxic to aquatic life with long lasting effects
Precautionary statement(s) Prevention	P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
	P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
	P271 Use only outdoors or in a well-ventilated area.
	P273 Avoid release to the environment.
Response	P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
	P381 In case of leakage, eliminate all ignition sources.
	P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
	P311 Call a POISON CENTER/doctor/…
	P321 Specific treatment (see ... on this label).
	P391 Collect spillage.
Storage	P410+P403 Protect from sunlight. Store in a well-ventilated place.
	P403 Store in a well-ventilated place.
	P403+P233 Store in a well-ventilated place. Keep container tightly closed.

P405 Store locked up.

Disposal

P501 Dispose of contents/container to ...

2.3 Other hazards which do not result in classification

none

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3. Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
methanethiol	methanethiol	74-93-1	none	100%

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4. First-aid measures

4.1 Description of necessary first-aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled

Fresh air, rest. Artificial respiration may be needed. Refer for medical attention.

In case of skin contact

Remove contaminated clothes. Refer for medical attention . ON FROSTBITE: rinse with plenty of water, do NOT remove clothes.

In case of eye contact

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms/effects, acute and delayed

Can cause death by respiratory paralysis. It is an eye and respiratory tract irritant. Exposure results in pulmonary edema and hepatic and renal damage.

(EPA, 1998)

4.3 Indication of immediate medical attention and special treatment needed, if necessary

Immediate first aid: Ensure that adequate decontamination has been carried out. If patient is not breathing, start artificial respiration, preferably with a demand-valve resuscitator, bag-valve-mask device, or pocket mask, as trained. Perform CPR as necessary. Immediately flush contaminated eyes with gently flowing water. Do not induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration. Keep patient quiet and maintain normal body temperature. Obtain medical attention. /Sulfur and related compounds/

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5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media

Stop flow of gas before extinguishing fire. Use water spray to control fire by preventing its spread and absorbing some of its heat.

5.2 Specific hazards arising from the chemical

Combustion produces irritating sulfur dioxide. Flash back along vapor track may occur. Very dangerous when exposed to heat, flame, or oxidizers. On decomposition it emits highly toxic fumes of sulfur oxides. It will react with water, steam or acids to produce toxic and flammable vapors; and can react vigorously with oxidizing materials. Irritating sulfur dioxide is produced upon combustion. When heated to decomposition, it emits highly toxic fumes and flammable vapors. Incompatible with mercuric oxide and oxidizing materials. Avoid direct sunlight, and areas of high fire hazards. Hazardous polymerization may not occur. (EPA, 1998)

5.3 Special protective actions for fire-fighters

Wear self-contained breathing apparatus for firefighting if necessary.

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6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.

6.2 Environmental precautions

Evacuate danger area! Consult an expert! Personal protection: self-contained breathing apparatus. Ventilation. Do NOT let this chemical enter the environment.

6.3 Methods and materials for containment and cleaning up

Stop or control the leak, if this can be done with undue risk. Use water spray to cool and disperse vapors, protect personnel, and dilute spills to form nonflammable mixtures. Control runoff and isolate discharged material for proper disposal.

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7. Handling and storage

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Avoid exposure - obtain special instructions before use.Provide appropriate exhaust ventilation at places where dust is formed. For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Fireproof. Separated from strong oxidants and acids. Cool. Store in an area without drain or sewer access.Separate from oxidizing materials. Store in a cool, dry, well-ventilated location.

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8. Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

Recommended Exposure Limit: 15 Minute Ceiling Value: 0.5 ppm (1 mg/cu m).

Biological limit values

no data available

8.2 Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash

hands before breaks and at the end of workday.

8.3 Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Safety glasses with side-shields conforming to EN166. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Wear impervious clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique(without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Respiratory protection

Wear dust mask when handling large quantities.

Thermal hazards

no data available

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9. Physical and chemical properties

Physical state	colourless gas with a garlic-like or rotten cabbage-like smell
Colour	Water-white liquid when below boiling point, or colorless gas
Odour	Odor of rotten cabbage
Melting point/ freezing point	2°C
Boiling point or initial boiling point and boiling range	6°C(lit.)
Flammability	Flammable GasExtremely flammable.
Lower and upper explosion limit /	Lower flammable limit:3.9% by volume; Upper flammable limit:21.8% by volume

flammability limit	
Flash point	-18°C
Auto-ignition temperature	no data available
Decomposition temperature	no data available
pH	no data available
Kinematic viscosity	no data available
Solubility	2 % (NIOSH, 2016)
Partition coefficient n-octanol/water (log value)	log Kow = 0.78 (est)
Vapour pressure	1536 mm Hg (20 °C)
Density and/or relative density	0.8665
Relative vapour density	1.66 (vs air)
Particle characteristics	no data available

10. Stability and reactivity

10.1 Reactivity

no data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

Very dangerous, when exposed to heat, flame; can react vigorously with oxidizing materials.The gas is heavier than air and may travel along the ground; distant ignition possible.METHYL MERCAPTAN is a reducing agent--can react vigorously with oxidizing agents. Dangerous fire or explosion hazard when exposed to heat, flame, sparks or strong oxidizing agents (e.g., calcium hypochlorite). When heating to decomposition emits highly toxic fumes of oxides of sulfur [Lewis, 3rd ed., 1993, p. 862]. Violent reaction with mercury(II) oxide [Klason P., Ber., 1887, 20, p. 3410].

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

Can react dangerously with strong oxidizing agents and mercury (II) oxide.

10.6 Hazardous decomposition products

Upon decomposition, emits highly toxic fumes of /sulfur oxides/.

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11. Toxicological information

Acute toxicity

- Oral: LD50 Mouse oral 61 mg/kg
- Inhalation: LC50 Mouse inhalation 1,664 ppm/4 hr
- Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

no data available

Reproductive toxicity

no data available

STOT-single exposure

no data available

STOT-repeated exposure

no data available

Aspiration hazard

no data available

12. Ecological information

12.1 Toxicity

- Toxicity to fish: no data available
- Toxicity to daphnia and other aquatic invertebrates: no data available
- Toxicity to algae: no data available
- Toxicity to microorganisms: no data available

12.2 Persistence and degradability

AEROBIC: Aerobic degradation of methyl mercaptan is insignificant compared to anaerobic degradation(1).

12.3 Bioaccumulative potential

An estimated BCF of 3 was calculated in fish for methyl mercaptan(SRC), using an estimated log Kow of 0.78(1) and a regression-derived equation(1). According to a classification scheme(2, this BCF suggests the potential for bioconcentration in aquatic organisms is low(SRC).

12.4 Mobility in soil

Using a structure estimation method based on molecular connectivity indices(1), the Koc of methyl mercaptan can be estimated to be 13(SRC). According to a classification scheme(2), this estimated Koc value suggests that methyl mercaptan is expected to have very high mobility in soil. Gaseous methyl mercaptan has been observed to partition to soils(3). For example, when gaseous methyl mercaptan was passed over six air-dried and moist (50% field capacity) soils, 2.4-32.1 mg/g and 2.2-21.4 mg/g of methyl mercaptan rapidly adsorbed to the dry and moist soils, respectively(3). Neither the capacity or rate of sorption was correlated to soil pH, organic matter content, or clay content; sterile controls ruled out the involvement of microorganisms(3); it was suggested that adsorption to soil surfaces might be an environmental sink for gaseous methyl mercaptan(3).

12.5 Other adverse effects

no data available

13. Disposal considerations

13.1 Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

14. Transport information

14.1 UN Number

ADR/RID: UN1064 IMDG: UN1064 IATA: UN1064

14.2 UN Proper Shipping Name

ADR/RID: METHYL MERCAPTAN
IMDG: METHYL MERCAPTAN
IATA: METHYL MERCAPTAN

14.3 Transport hazard class(es)

ADR/RID: 2.3 IMDG: 2.3 IATA: 2.3

14.4 Packing group, if applicable

ADR/RID: unknown IMDG: unknown IATA: unknown

14.5 Environmental hazards

ADR/RID: yes IMDG: yes IATA: yes

14.6 Special precautions for user

no data available

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

no data available

15. Regulatory information

15.1 Safety, health and environmental regulations specific for the product in question

Chemical name	Common names and synonyms	CAS number	EC number
methanethiol	methanethiol	74-93-1	none
European Inventory of Existing Commercial Chemical Substances (EINECS)			Listed.
EC Inventory			Listed.
United States Toxic Substances Control Act (TSCA) Inventory			Listed.
China Catalog of Hazardous chemicals 2015			Listed.
New Zealand Inventory of Chemicals (NZIoC)			Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)			Listed.
Vietnam National Chemical Inventory			Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)			Listed.

16. Other information

Information on revision

Creation Date	Aug 16, 2017
Revision Date	Aug 16, 2017

Abbreviations and acronyms

- CAS: Chemical Abstracts Service
- ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
- RID: Regulation concerning the International Carriage of Dangerous Goods by Rail
- IMDG: International Maritime Dangerous Goods
- IATA: International Air Transportation Association
- TWA: Time Weighted Average
- STEL: Short term exposure limit
- LC50: Lethal Concentration 50%

- LD50: Lethal Dose 50%
- EC50: Effective Concentration 50%

References

- IPCS - The International Chemical Safety Cards (ICSC), website: http://www.ilo.org/dyn/icsc/showcard.home
- HSDB - Hazardous Substances Data Bank, website: https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm
- IARC - International Agency for Research on Cancer, website: http://www.iarc.fr/
- eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en
- CAMEO Chemicals, website: http://cameochemicals.noaa.gov/search/simple
- ChemIDplus, website: http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp
- ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: http://www.phmsa.dot.gov/hazmat/library/erg
- Germany GESTIS-database on hazard substance, website: http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp
- ECHA - European Chemicals Agency, website: https://echa.europa.eu/
