

GPS Safety Summary

Substance Name:

Methylmercaptan

1. General Statement

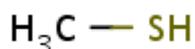
Methylmercaptan is a colourless gas, with a strong characteristic odour and a very low odour threshold (about 1 ppb). It's a naturally occurring chemical resulting from the decomposition of organic matter.

In industry, it is used as a chemical intermediate under strictly controlled conditions. Products containing methylmercaptan are commercially available to industrial customers only.

Extremely flammable gas, toxic if inhaled, very toxic to the aquatic life with long lasting effects, this substance must be carefully handled and stored to preserve human health and environment.

2. Chemical Identity

Name: Methylmercaptan
Brand name: Methylmercaptan
Chemical name (IUPAC): Methanethiol
CAS number(s): 74-93-1
EC number: 200-822-1
Molecular formula: CH₄S
Structure:



3. Use and applications

Methylmercaptan is an excellent thiomethylation agent used in synthesis of various organic compounds such as methionine (amino acid used in animal feed), pharmaceuticals, plant protection products and others.

Its extreme flammability and toxic properties require particularly strict and controlled procedures during storage, transport and use.

4. Physical / Chemical properties

Property	Value
Physical state	Gaseous at 20°C and 1013 hPa Liquefied gas
Colour	Colourless
Odour	Strong garlic odour, rotten cabbage
Density	0.89 at 0°C (liquefied gas)

Vapour pressure	1650 hPa at 20°C 2013 hPa at 25°C 9500 hPa at 80°C
Freezing / boiling points	-123°C / 5.95°C at 1013hPa
Flammability	Extremely flammable gas
Flash point	-17.8°C (open cup)
Self-ignition temperature	364°C at 1013 hPa
Explosive properties	Not explosive due to chemical structure
Oxidizing properties	Not oxidising due to chemical structure
Water solubility	23.3 g/L at 20°C
Octanol-water partition coefficient (Log K _{ow})	0.78 (calculated)

5. Health Effects

Effect Assessment	Result
Acute Toxicity Oral / inhalation / dermal	Toxic by inhalation exposure
Irritation / corrosion Skin / eye/ respiratory tract	This information is not available
Sensitisation	Not a skin sensitizer
Toxicity after repeated exposure Oral / inhalation / dermal	No significant adverse effect after repeated inhalation exposure
Genotoxicity / Mutagenicity	Not genotoxic
Carcinogenicity	This information is not available
Reproductive / Developmental Toxicity	No adverse effect on the reproduction was observed with an analogue substance

6. Environmental Effects

Effect Assessment	Result
Aquatic Toxicity	Toxic to aquatic organisms

Fate and behaviour	Result
Biodegradation	Readily biodegradable
Bioaccumulation potential	Not expected to bioaccumulate
PBT / vPvB conclusion	Not considered to be either PBT or vPvB

7. Exposure

7.1 Human health

The most likely route of human exposure (workers) to methylmercaptan is through inhalation and/or to a much lesser extent dermal contact. In industrial settings, due to its immediate volatilisation, dermal contact and ingestion are not an anticipated route of exposures.

The substance is industrially manufactured and used almost entirely within closed systems, under strictly controlled conditions, thus minimizing the occupational exposure potential.

Procedures, controls, collective and personal risk management measures are in place, which limit the occupational exposure. Workers who might accidentally come into contact with the undiluted substance should follow the safety measures recommended in the Safety Data Sheet.

When used under strictly controlled conditions as recommended in the Safety Data Sheet, exposure is negligible and thus risks acceptable.

7.2 Environment

Based on its physico-chemical properties, methylmercaptan is slightly soluble in water. It is not hydrolysable but it is readily biodegradable. In the atmosphere, it undergoes direct photolysis, with a half-life of 3.8h. Regarding soil compartment, methylmercaptan will rapidly evaporate (half-life 2.2h) and is expected to slightly adsorb on soil and sediment particles. It has a low potential for bioaccumulation.

The substance is industrially manufactured and used entirely within closed systems, under strictly controlled conditions, and consumed when used as an intermediate, thus minimizing environmental release potential. Procedures, controls and risk management measures are in place, which limit the environmental exposure.

When used under strictly controlled conditions as recommended in the Safety Data sheet, environmental releases are negligible and thus risks are acceptable.

8. Risk Management recommendations

Human health measures		
Organizational	Implement high standards of occupational hygiene. Hygiene measures must be respected and incompatible materials must be clearly identified. Ensure operatives are well informed of the hazards and trained to minimize exposures. Maintain clear and up-to-date handling procedures and control their application. Collect the latest available Safety Data Sheet. Handle and store according to the indications of the Safety Data Sheet.	
Protection	Eye/Face protection:	Safety glasses
	Skin protection:	At the workplace: combination with delayed penetration. Intervention at incident: combination with delayed penetration, anti-acid suit.
	Hand protection:	Splash contact, intermittent and prolonged contact: gloves nitrile rubber, thickness 0.75 mm (complying with EN 374)
	Respiratory protection:	Low concentration or short activity: self contained breathing apparatus. High concentration or prolonged activity: on line apparatus.

Engineering controls	<p>Manufacture and use in rigorously contained (closed) systems. Ensure sufficient air exchange and/or exhaust in work area. Use material of high integrity for loading and unloading. Routine monitoring and inspections for leaks to reduce fugitive emissions. Investigate engineering techniques to reduce exposures. Ensure that eyewash stations and safety showers are close to workstation locations. Provide electrical earthing of equipment and electrical equipment usable in explosive atmospheres</p>
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Environmental protective measures
<p>Do not release into the environment. Do not let product enter drains. Use techniques to minimize emissions (incineration or any treatment to minimize level of release). For recovery, pump into a labelled inert emergency tank. Destroy by oxidation with dilute solutions of hydrogen peroxide or sodium hypochlorite or by incineration in accordance with local and national regulations.</p>

9. Regulatory Information / Classification and Labelling

9.1 Regulatory Information

This substance has been registered under:

- EU Regulation EC 1907/2006 (REACH)

This substance is on the inventories of USA, Australia, Canada, Japan, Korea, Philippines and China.

9.2 Classification and labelling

Under GHS substances are classified according to their physical, health, and environmental hazards. The hazards are communicated via specific labels and the safety data sheet. GHS attempts to standardize hazard communication so that the intended audience (workers, consumers, transport workers, and emergency responders) can better understand the hazards of the chemicals in use. Substances registered for REACH are classified according to CLP (EC) 1272/2008, implementation of the GHS in the European Union.

Classification
<p>According to REGULATION (EC) no 1272/2008:</p> <ul style="list-style-type: none"> – Gases under pressure, Liquefied gas – Flammable gases cat. 1 – Acute toxicity (inhalation) cat. 3 – Acute aquatic toxicity cat. 1 – M factor = 1 – Chronic aquatic toxicity cat. 1 – M factor = 1
Signal Word
Danger

Pictogram	
– GHS02: Flame	
– GHS04: Gas cylinder	
– GHS06: Skull and crossbones	
– GHS09: Environment	
Hazard statement	
<ul style="list-style-type: none"> – H220: Extremely flammable gas – H280: Contains gas under pressure, may explode if heated – H331: Toxic if inhaled – H410: Very toxic to aquatic life with long lasting effects 	
Alternative classification according to Globally Harmonized System (GHS)	
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10. Contact Information within Company

For further information on this substance or product safety summary in general, please contact:

- Arkema web site : on the product page, an actualised contact name is provided
<http://www.arkema.com>
- **ICCA portal where the GPS Safety Summary is posted:**
<http://www.icca-chem.org/en/Home/ICCA-initiatives/global-product-strategy/>

11. Date of Issues / Revision

- Date of issue: 2014/12/15
- Date of revision:

12. Disclaimer

The information contained in this paper is intended as advice only and whilst the information is provided in utmost good faith and has been based on the best information currently available, is to be relied upon at the user's own risk.

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