

## GPS Safety Summary

**Substance Name:**

**Dimethyl Disulphide**

### 1. General Statement

---

Dimethyl disulphide is a light yellow liquid with a very characteristic smell and an extremely low odour threshold at 8 to 10 ppb. DMDS is an ubiquitous substance that is part of the naturally occurring global sulphur cycle. It is released to the atmosphere in emissions from soil, plants, microbes, food and animal wastes and from the oceans.

Products containing dimethyl disulphide are manufactured at industrial scale and are commercially available to industrial and professional customers.

Flammable, harmful if swallowed, toxic if inhaled, irritating to eyes and respiratory tract, sensitising for the skin and very toxic to aquatic fauna with long lasting effects, this substance must be carefully handled and stored to preserve human health and environment.

### 2. Chemical Identity

---

**Name:** Dimethyl disulphide

**Brand names:** /

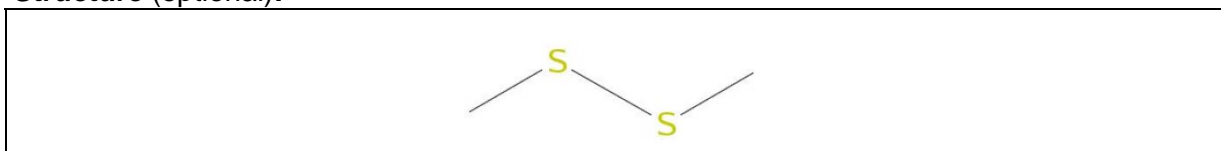
**Chemical name (IUPAC):** Dimethyl disulfide

**CAS number(s):** 624-92-0

**ES number (optional):** 210-871-0

**Molecular formula (optional):** C<sub>2</sub>H<sub>6</sub>S<sub>2</sub>

**Structure (optional):**



### 3. Use and applications

---

DMDS is a thiomethylation agent used for organic synthesis. It is the most widely used sulphur compound as presulfiding agent for hydrodesulfurization, hydrotreatment and hydrocracking catalysts in oil refineries. DMDS is added to sweet steam cracker feedstocks to reduce coke, prevent CO formation and tube corrosion, and thus increase run length of furnaces. DMDS has been registered for use by many countries as a preplant soil fumigant with activity against nematodes, weeds and soil pathogens for a number of crops

DMDS is also approved as a food flavouring agent.

### 4. Physical / Chemical properties

---

Property	Value
Physical state (Liquid/solid/gaseous)	Liquid at 20°C and 1013 hPa

Colour	Light yellow
Odour	Strong garlic odour
Molecular weight	94.199 g/mol
Density	1.062 at 20°C
Melting / boiling point	-85°C
Boiling Point	109.2°C at 1013 hPa
Flammability (optional) H statement in case classified	Highly flammable liquid
Explosive properties	Not explosive based on its structure
Oxidising properties	Not oxidising based on its structure
Self-ignition temperature	304°C at 1013 hPa
Vapour pressure	38.6 hPa at 25°C
Water solubility	2.7 g/l at 20°C
Flash point	15°C (closed cup) at 1013 hPa
Octanol-water partition coefficient (LogKow)	1.91 at 20°C

## 5. Health Effects

Effect Assessment	Result
Acute Toxicity Oral / inhalation / dermal	Toxic by inhalation. Harmful by oral route. Low toxicity by dermal route.
Irritation / corrosion Skin / eye/ respiratory tract	Slightly irritating for the skin, irritating for the eyes and the respiratory tract.
Sensitisation	Weak skin sensitizer.
Toxicity after repeated exposure Oral / inhalation / dermal	No relevant systemic toxicity following repeated inhalation exposure.
Genotoxicity / Mutagenicity	No evidence of genetic toxicity.
Carcinogenicity	Not suspected to have a carcinogenic potential.
Toxicity for reproduction	No evidence of toxicity for reproduction and the foetal development.

## 6. Environmental Effects

Effect Assessment	Result
Aquatic Toxicity	Very toxic to aquatic organisms

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

\*: Persistent, Bioaccumulative and Toxic (PBT)

\*\* : very Persistent and very Bioaccumulative (vPvB)

## 7. Exposure

---

### 7.1 Human health

In industrial and professional settings, the most likely route of human exposure (workers) to dimethyl disulphide is through inhalation and/or to a much lesser extent dermal contact.

Toxic if inhaled and harmful if swallowed, dimethyl disulphide can also be irritating to respiratory system. Moreover, dimethyl disulphide is a skin sensitizer and is irritating to eyes.

The probability of exposure to industrial and professional workers is expected to be low because this product is manufactured in enclosed controlled environment and is transported in well sealed containers. Due to its low odour threshold leaks can be detected quickly and prolonged exposure can be avoided. However, workers may be exposed during (un)loading, mixing, sampling, analysis or maintenance operations and particularly in case of batch processes. The exposure must be kept as minimum as possible by the use of appropriate risk management measures as suitable collective and personal protective equipment, good industrial hygiene practices and risk communication through appropriate training of workers.

For more information about conditions recommended, refer to the extended safety data sheet.

### 7.2 Environment

The presence of DMDS in the environment originates either from natural processes or from anthropogenic activities. Based on its physico-chemical properties, dimethyl disulphide is volatile substance which is not expected to remain in water. It has a low potential of bioaccumulation and is inherently biodegradable. Its adsorption coefficient (Koc) tends to indicate that dimethyl disulphide would partially sorb on soil/sediment particles. Therefore it would mainly occur in atmosphere where its half life is very short due to atmospheric oxidation (less than one hour).

Due to the potential of this substance to cause significant harm to aquatic environments, care should be taken to avoid releases of these products to sewage, drainage systems, water bodies and the atmosphere. Spillage shall be quickly collected in the event of an accidental release. More information about release measures and accidental release measures are available in the extended safety data sheet.

## 8. Risk Management recommendations

---

Human health measures		
<b>Organizational</b>	Implement a good basic standard of occupational hygiene. Ensure operatives are well informed of the hazards and trained to minimize exposures. Hygiene measures must be respected and incompatible materials must be clearly identified.	
<b>Protection</b>	<b>Eye/Face protection:</b>	Safety glasses with side-shields
	<b>Skin protection:</b>	Combination with delayed penetration
	<b>Hand protection:</b>	Gloves nitrile rubber (complying with EN 374) Glove thickness depending on the use to ensure mechanical resistance to tear and abrasion
	<b>Respiratory protection:</b>	In case of insufficient ventilation, wear a suitable respiratory equipment (recommended filter type: A2) In case of high concentrations or prolonged activity: On line apparatus.

<b>Engineering controls</b>	Ensure sufficient air exchange and/or exhaust in work area. Ensure that eyewash stations and safety showers are close to workstation locations.
<b>Environmental protective measures</b>	
<ul style="list-style-type: none"> <li>– This substance and all industrial releases that may contain the substance must be treated to avoid any exposure to the environment.</li> <li>– Eliminate by incineration in accordance with local and national regulations.</li> </ul>	

## 9. Regulatory Information / Classification and Labelling




### 9.1 Regulatory Information

This substance has been registered under:

- EU Regulation EC 1907/2006 (REACH)
- EU Regulation EC 872/2012 (Food Flavouring substances)
- US Environmental Protection Agency, Israel, Mexico, Turkey, Jordan, Morocco as a preplant soil fumigant with activity against nematodes

### 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 eSDS. 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 CLP (EC) 1272/2008, implementation of the GHS in the European Union.

<b>Classification</b>	
According to REGULATION (EC) no 1272/2008:	
<ul style="list-style-type: none"> <li>– Flammable liquids cat. 2</li> <li>– Oral: Acute toxicity cat.4</li> <li>– Inhalation: Acute toxicity cat.3</li> <li>– Eye irritation cat.2</li> <li>– Inhalation: Specific Target Organ Toxicity – Single Exposure cat.3</li> <li>– Skin sensitisation cat. 1B</li> <li>– Acute aquatic toxicity cat.1</li> <li>– Chronic aquatic toxicity cat.1</li> </ul>	
<b>Signal Word</b>	
Danger	
<b>Pictogram</b>	
– GHS03: Flame	
– GHS06: Skull and crossbones	
– GHS09: Environment	

Hazard statement
<ul style="list-style-type: none"> <li>– H225: Highly flammable liquid and vapour</li> <li>– H302: Harmful if swallowed</li> <li>– H331: Toxic if inhaled</li> <li>– H319: Causes serious eye irritation</li> <li>– H335: May cause respiratory irritation</li> <li>– H317: May cause an allergic skin reaction</li> <li>– H410: Very toxic to aquatic life with long lasting effects</li> </ul>
Alternative classification according to Globally Harmonized System (GHS)
<ul style="list-style-type: none"> <li>– Skin irritation cat.3 (H316: Causes mild skin irritation)</li> </ul>

## 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: 2014/07/31
- 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.

**NO WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE, WARRANTY OF MERCHANTABILITY, OR ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, IS MADE CONCERNING THE INFORMATION PROVIDED HEREIN.**

No liability will be accepted by ARKEMA for damages of any nature whatsoever resulting from the use of or reliance on the information.