GPS Safety Summary

Substance Name:

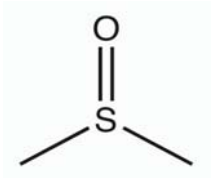
Dimethylsulfoxide

1. General Statement

Dimethylsulfoxide is a clear liquid mainly used as a solvent.
This substance has limited human health and environmental hazards as confirmed by the absence of hazard classification.

2. Chemical Identity

Name:	Dimethylsulfoxide
Brand name:	DMSO
Chemical name (IUPAC):	Dimethyl Sulfoxide
CAS number:	67-68-5
EC number:	200-664-3
Molecular formula:	C_2H_6OS
Structure:	



3. Use and applications

DMSO is a polar aprotic solvent with very extensive solvent properties towards organic and mineral substances. It is used:

- in formulation of agrochemical, pharmaceutical and veterinary products;
- in formulation used in paint stripping, glue and inks;
- in manufacturing of polymers, polysulphones, etc.;
- in the extraction of unsaturated hydrocarbons aromatics or olefins;
- in formulations used for industrial cleaning and decontamination.

The aprotic character and strong polarity of DMSO make it an ideal medium for certain chemical reactions: elimination reaction, substitution reactions, transesterification.

DMSO is also a very selective mild oxidation agent.

4. Physical / Chemical properties

Dimethylsulfoxide is a combustible liquid substance with the following physicochemical properties:

Property	Value
Physical state	Liquid at 20°C and 1013 hPa
Colour	Colourless
Odour	Sulphur-like
Molecular weight	78.1 g/mol
Density	1.1 at 20°C
Vapour pressure	0.56 hPa at 20°C
Freezing / boiling points	18.5°C / 189°C at 1013 hPa
Flash point – flammability	87 °C – combustible liquid
Self-ignition temperature	300-302°C
Explosive / oxidizing properties	Not expected based on structure
Water solubility	~1 kg/L at 20°C (fully soluble)
Octanol-water partition coefficient (Log K_{ow})	-1.35 at 20°C

5. Health Effects

Effect Assessment	Results
Skin permeability	Due to its strong solvent properties, the substance is significantly absorbed by skin contact and can enhance the skin penetration of other substances mixed or dissolved in this solvent.
Acute Toxicity Oral / inhalation / dermal	Not harmful if swallowed, by inhalation and by contact with skin.
Irritation / corrosion Skin / eye/ respiratory tract	Slightly irritating to skin and eyes. No data on respiratory irritation.
Sensitisation	Did not cause allergic skin reactions by skin contact in animals and humans.
Toxicity after repeated exposure Oral / inhalation / dermal	In humans: skin irritation, nausea, tiredness and digestive troubles after repeated skin contact at high doses. In animals: respiratory tract irritation by inhalation, no noteworthy effects by ingestion.
Genotoxicity / Mutagenicity	Based on the available test data, not expected to cause genetic effects.
Carcinogenicity	Chronic ingestion or skin application did not lead to tumour development in animals.
Reproductive / Developmental Toxicity	Did not alter fertility of animals in a screening study. No relevant toxic effects on development in animals.

6. Environmental Effects

Effect Assessment	Result
Aquatic Toxicity	Acute and Chronic: not harmful.

Fate and behaviour	Result
Biodegradation	Not readily 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

Workers:

The most likely route of workers to dimethylsulfoxide is through inhalation and/or to a much lesser extent dermal contact. In industrial settings, ingestion is not an anticipated route of exposure.

Dimethylsulfoxide is industrially manufactured and (generally) used within closed systems or under processes minimizing the occupational exposure potential. A use which stands out with higher potential exposure is spraying/roller application. Exposure may occur either in manufacturing facilities or in facilities using Dimethylsulfoxide. Workers may be exposed during cleaning, maintenance, transfer, sampling and analysis, mixing, spraying/roller application, treatment of articles.

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

According to the REACH regulation, in the absence of classification (no significant hazard), risks are considered to be controlled when activities are carried out under conditions recommended in the Safety Data Sheet.

Consumers:

Consumers may be exposed to Dimethylsulfoxide as it is used as a solvent in a large variety of products.

Indirect exposure via the environment is negligible due to the negligible bioaccumulative potential.

7.2 Environment

Dimethylsulfoxide is industrially manufactured and (generally) used in a continuous or batch process, minimizing release to the environment. A use which stands out with large potential environmental exposure is wide dispersive use as a solvent in open systems. Potential releases mainly occur via wastewater due to the low volatility and high solubility.

Care should be taken to avoid releases of this product to sewage, drainage systems and water bodies. Spillage shall be quickly collected in the event of an accidental release.
According to the REACH regulation, in the absence of classification (no significant hazard), risks are considered to be controlled when activities are carried out under conditions recommended in the Safety Data Sheet.

8. Risk Management recommendations

Human health measures		
Organizational	Implement good basic standards of occupational hygiene. Ensure operatives are well informed of the hazards and trained to minimise exposures. Handle and store according to the indications of the Safety Data Sheet.	
Engineering controls	Ensure air exchange and/or exhaust in work areas. Ensure that eye- and handwash stations are close to workstation locations.	
Protection	Eye/Face protection:	Safety goggles.
	Skin protection:	Combination with delayed penetration. In case of intervention at incident, wear an anti-acid suit.
	Hand protection:	Nitrile rubber gloves (thickness 0.75 mm).
	Respiratory protection:	Respiratory equipment if ventilation is insufficient.
Environment protective measures		
Do not release into the environment. Do not let product enter drains.		

9. Regulatory Information / Classification and Labelling

9.1 Regulatory Information

This substance has notably been registered under:

— EU Regulation EC 1907/2006 (REACH)

The substance is also listed at the annex I of the EU Regulation EC 10/2011 (PIM).

This substance is listed on the inventories of USA, Australia, Canada, Japan, Korea, Philippines, New Zealand 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 according to CLP (EC) 1272/2008
None
Classification according to Globally Harmonized System (GHS)
Flammable liquids: Category 4; Combustible liquid.

10. Contact Information within Company

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

- 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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