Safety Data Sheet

Dimethyl sulfate

Version 3.0

Revision Date 09/16/2015 Ref. 130000000491

This SDS adheres to the standards and regulatory requirements of the United States and may not meet the regulatory requirements in other countries.

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name	:	Dimethyl sulfate
Tradename/Synonym	:	DMS Dimethyl Sulphate Sulfuric acid, dimethyl ester
Product Use	:	Chemical intermediate, For industrial use only.
Restrictions on use	:	Do not use product for anything outside of the above specified uses
Manufacturer/Supplier	:	The Chemours Company FC, LLC 1007 Market Street Wilmington, DE 19899 United States of America
Product Information	:	1-844-773-CHEM (outside the U.S. 1-302-773-1000)
Medical Emergency	:	1-866-595-1473 (outside the U.S. 1-302-773-2000)
Transport Emergency	:	CHEMTREC: +1-800-424-9300 (outside the U.S. +1-703-527-3887)

SECTION 2. HAZARDS IDENTIFICATION

Product hazard category

Flammable liquids	Category 4
Acute toxicity (Oral)	Category 3
Acute toxicity (Inhalation)	Category 1
Skin corrosion	Category 1B
Serious eye damage/eye irritation	Category 1
Skin sensitisation	Category 1
Germ cell mutagenicity	Category 2
Carcinogenicity	Category 1B

Specific target organ toxicity - single exposure	Category 3

Label content

Pictogram :

Signal word : Danger

Hazardous warnings : Combustible liquid.
Toxic if swallowed.
Causes severe skin burns and eye damage.
May cause an allergic skin reaction.
Fatal if inhaled.
May cause respiratory irritation.
May cause drowsiness or dizziness.
Suspected of causing genetic defects.
May cause cancer.

Hazardous prevention measures	: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from heat/sparks/open flames/hot surfaces. No smoking. Do not breathe dust/ fume/ gas/ mist/ vapours/ spray. Wash skin thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Contaminated work clothing should not be allowed out of the workplace. Wear protective gloves/ protective clothing/ eye protection/ face protection. Use personal protective equipment as required. Wear respiratory protection. IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician. IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF exposed or concerned: Get medical advice/ attention. Immediately call a POISON CENTER/doctor. If skin irritation or rash occurs: Get medical advice/ attention. Wash contaminated clothing before reuse. In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction. Store in a well-ventilated place. Keep container tightly closed. Store in a well-ventilated place. Keep cool. Store locked up. Dispose of contents/ container to an approved waste disposal plant.

Other hazards

Dangerous amounts can be absorbed through the skin.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS-No.	Concentration
Dimethyl sulphate	77-78-1	>99%

SECTION 4. FIRST AID MEASURES

General advice : Remove from exposure, lie down. Never give anything by mouth to an unconscious person.

Inhalation : Move to fresh air. Artificial respiration and/or oxygen may be necessary. Call a physician immediately.

Skin contact : Immediately flush skin with large amounts of water. Remove contaminated clothing and shoes. Consult a physician.

Eye contact : Rinse immediately with plenty of water, also under the eyelids. Remove contact lenses. Seek medical advice.

Ingestion : Do NOT induce vomiting. Rinse mouth. Immediately give plenty of water (if possible charcoal slurry). Call a physician immediately. Never give anything by mouth to an unconscious person.

Most important symptoms/effects, acute and delayed : No applicable data available.

Protection of first-aiders : First Aid responders should pay attention to self-protection and use the recommended protective clothing

Notes to physician	: Dangerous amounts can be absorbed through the skin. Note: To prepare activated charcoal slurry, mix thoroughly 50 g of activated charcoal in 400 ml (about 2 cups) water.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	: Water, Foam, Dry chemical, Carbon dioxide (CO2)
Unsuitable extinguishing media	: No applicable data available.
Specific hazards	: No applicable data available.
Special protective equipment for firefighters	: Wear self-contained breathing apparatus and protective suit.
Further information	: Cool containers/tanks with water spray. 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.

SECTION 6. ACCIDENTAL RELEASE MEASURES

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

Safeguards (Personnel)	: Ensure adequate ventilation. Wear personal protective equipment. Wear respiratory protection. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Remove all sources of ignition.
Environmental precautions	: Prevent product from entering drains. Do not flush into surface water.
Spill Cleanup	: Dam up. Soak up with inert absorbent material and dispose of as hazardous waste. After cleaning, flush away traces with water. Neutralize with: soda ash Use mechanical handling equipment.

Accidental Release Measures : Dispose of in accordance with local regulations.

SECTION 7. HANDLING AND STORAGE

Handling (Personnel) : Handle product only in closed system or provide appropriate exhaust ventilation at machinery. Wear personal protective equipment. Do not breathe vapours or spray mist. Avoid contact with skin, eyes and clothing.
General industrial hygiene practice. Wash hands before breaks and immediately after handling the product. Wash contaminated clothing before re-use.

Handling (Physical Aspects) : Keep away from open flames, hot surfaces and sources of ignition. No smoking.

Dust explosion class : No applicable data available.

Storage : Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Keep away from: Strong oxidizing agents Strong bases Ammonia solution

Storage period : No applicable data available.

Storage temperature : No applicable data available.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls : Ensure adequate ventilation.

Personal protective equipment

Respiratory protection : When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. In case of insufficient ventilation, wear suitable respiratory equipment.

Hand protection : Additional protection: Impervious butyl rubber gloves

Eye protection : Wear coverall chemical splash goggles and face shield when the possibility

exists for eye and face contact due to splashing or spraying of material.

Skin and body protection : Where there is potential for skin contact have available and wear as appropriate:
butyl-rubber
Apron
Boots

Protective measures : Avoid exposure - obtain special instructions before use.

Exposure Guidelines
Exposure Limit Values

Dimethyl sulfate				
Permissible exposure limit:	(OSHA)	1 ppm	5 mg/m3	8 hr. TWA
TLV	(ACGIH)	0.1 ppm	TWA	

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance
Physical state : liquid
Form : liquid
Color : colourless

Odor : none

Odor threshold : No applicable data available.

pH : No applicable data available.

Melting point/freezing point : Solidification point
-32 °C (-26 °F)

Boiling point/boiling range : Boiling point
189 °C (372 °F) at 1,013 hPa

Flash point	:	83 °C Method: Tag closed cup - TCC
Evaporation rate	:	No applicable data available.
Flammability (solid, gas)	:	No applicable data available.
Upper explosion limit	:	23.2 vol%
Lower explosion limit	:	3.6 vol%
Vapor pressure	: :	0.93 hPa at 25 °C (77 °F) 1.47 hPa at 38 °C (100 °F)
Vapour density	:	No applicable data available.
Specific gravity (Relative density)	:	1.33 at 20 °C (68 °F)
Water solubility	:	28 g/l at 18 °C (64 °F) hydrolyses
Solubility(ies)	:	No applicable data available.
Partition coefficient: n-octanol/water	:	No applicable data available.
Auto-ignition temperature	:	No applicable data available.
Ignition temperature	:	495 °C
Decomposition temperature	:	No applicable data available.
Viscosity, kinematic	:	No applicable data available.
Viscosity, dynamic	:	No applicable data available.

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	No applicable data available.
Chemical stability	:	Stable under recommended storage conditions.
Possibility of hazardous reactions	:	No applicable data available.
Conditions to avoid	:	Exposure to moisture
Incompatible materials	:	Strong oxidizing agents Strong bases, Ammonia, Azo-compounds
Hazardous decomposition products	:	Methanol, Sulphur compounds

SECTION 11. TOXICOLOGICAL INFORMATION

Dimethyl sulphate

Inhalation 4 h LC50	:	0.045 mg/l , Rat Target Organs: Respiratory system Respiratory effects
Oral LD50	:	106.4 mg/kg , Rat Target Organs: Respiratory system Respiratory effects
Skin irritation	:	Corrosive after 3 minutes to 1 hour of exposure, Rabbit
Eye irritation	:	Corrosive, Rabbit
Skin sensitization	:	May cause sensitisation by skin contact., Mouse
Repeated dose toxicity	:	Inhalation Rat - 130 d vapour NOAEL: > 0.0252 mg/l No toxicologically significant effects were found.
Carcinogenicity	:	Possible human carcinogen An increased incidence of tumours was observed in laboratory animals.

Mutagenicity	:	In vitro tests showed mutagenic effects Genetic damage in animals was observed in some laboratory tests but not in others. Tests on mammalian cell cultures showed mutagenic effects. Experiments showed mutagenic effects in cultured bacterial cells.
Reproductive toxicity	:	No toxicity to reproduction Animal testing showed no reproductive toxicity.
Teratogenicity	:	Animal testing showed no developmental toxicity.

Carcinogenicity

The carcinogenicity classifications for this product and/or its ingredients have been determined according to HazCom 2012, Appendix A.6. The classifications may differ from those listed in the National Toxicology Program (NTP) Report on Carcinogens (latest edition) or those found to be a potential carcinogen in the International Agency for Research on Cancer (IARC) Monographs (latest edition).

Material	IARC	NTP	OSHA
Dimethyl sulphate	2A	X	

SECTION 12. ECOLOGICAL INFORMATION

Aquatic Toxicity

Dimethyl sulphate

96 h LC50	:	Leuciscus idus (Golden orfe) 14 mg/l OECD Test Guideline 203
72 h ErC50	:	Desmodesmus subspicatus (green algae) 46.9 mg/l OECD Test Guideline 201
72 h NOEC	:	Desmodesmus subspicatus (green algae) 10 mg/l OECD Test Guideline 201
48 h EC50	:	Daphnia magna (Water flea) 17 mg/l OECD Test Guideline 202

Environmental Fate

Dimethyl sulphate

Bioaccumulation : Does not bioaccumulate.

SECTION 13. DISPOSAL CONSIDERATIONS

Waste disposal methods - Product	:	Dispose of as special waste in compliance with local and national regulations. Can be incinerated, when in compliance with local regulations.
Contaminated packaging	:	If recycling is not practicable, dispose of in compliance with local regulations.

SECTION 14. TRANSPORT INFORMATION

DOT	UN number	:	1595
	Proper shipping name	:	Dimethyl sulfate
	Class	:	6.1 (8)
	Packing group	:	I
	Labelling No.	:	6.1 (8)
IATA_C		:	Forbidden for transport by aircraft
IMDG	UN number	:	1595
	Proper shipping name	:	DIMETHYL SULPHATE
	Class	:	6.1 (8)
	Packing group	:	I
	Labelling No.	:	6.1 (8)

IATA prohibits air cargo transport.

SECTION 15. REGULATORY INFORMATION

TSCA	:	On the inventory, or in compliance with the inventory
SARA 313 Regulated Chemical(s)	:	Dimethyl sulphate
PA Right to Know Regulated Chemical(s)	:	Substances on the Pennsylvania Hazardous Substances List present at a concentration of 1% or more (0.01% for Special Hazardous Substances): Dimethyl sulfate
NJ Right to Know Regulated Chemical(s)	:	Substances on the New Jersey Workplace Hazardous Substance List present at a concentration of 1% or more (0.1% for substances identified as carcinogens, mutagens or teratogens): Dimethyl sulfate
Title III hazard classification	:	Acute Health Hazard: Yes Chronic Health Hazard: Yes Fire: Yes Reactivity/Physical hazard:No Pressure: No
SARA Reportable Quantity	:	100 lbs Based on the percentage composition of this chemical in the product.: Dimethyl sulphate
California Prop. 65	:	WARNING! This product contains a chemical or chemicals known to the State of California to cause cancer.Dimethyl sulfate

SECTION 16. OTHER INFORMATION

		NFPA
Health	:	4
Flammability	:	2

Dimethyl sulfate

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Reactivity/Physical hazard : 0

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