

DIMETHYL SULFATE

DSF

CAUTIONARY RESPONSE INFORMATION

Common Synonyms Methyl sulfate	Liquid Sinks and mixes slowly with water.	Colorless Mild onion odor
Evacuate. Keep people away. AVOID CONTACT WITH LIQUID. Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves). Call fire department. Notify local health and pollution control agencies. Protect water intakes.		
Fire	Combustible. POISONOUS GASES ARE PRODUCED WHEN HEATED. Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves). Extinguish with water, foam, dry chemical, or carbon dioxide. Cool exposed containers with water.	
Exposure	CALL FOR MEDICAL AID. LIQUID POISONOUS IF SWALLOWED OR IF SKIN IS EXPOSED. Will burn eyes. Remove contaminated clothing and shoes. Flush affected areas with plenty of water. IF IN EYES; hold eyelids open and flush with plenty of water. IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk. DO NOT INDUCE VOMITING.	
Water Pollution	Effect of low concentrations on aquatic life is unknown. May be dangerous if it enters water intakes. Notify local health and wildlife officials. Notify operators of nearby water intakes.	

1. CORRECTIVE RESPONSE ACTIONS	2. CHEMICAL DESIGNATIONS
Dilute and disperse Stop discharge Collection Systems: Pump; Dredge Do not burn Clean shore line Salvage waterfowl	2.1 CG Compatibility Group: Not listed. 2.2 Formula: $(CH_3)_2SO_4$ 2.3 IMO/UN Designation: 6.1/1595 2.4 DOT ID No.: 1595 2.5 CAS Registry No.: 77-78-1 2.6 NAERG Guide No.: 156 2.7 Standard Industrial Trade Classification: 51549
3. HEALTH HAZARDS	
3.1 Personal Protective Equipment: Chemical goggles; self-contained breathing apparatus; safety hat; rubber shoes; rubber suit; rubber gloves; safety shower and eye wash fountain. 3.2 Symptoms Following Exposure: Severe irritation to eyes, eyelids, respiratory tract and skin. Dry, painful cough; foamy, white sputum; difficulty in breathing; malaise and fever; inflammation and edema of lungs. 3.3 Treatment of Exposure: Contact with dimethyl sulfate liquid or vapor (> 1 ppm) requires immediate treatment. Call a physician, even if there is no evidence of injury, as symptoms may not appear for several hours. INHALATION: get victim to fresh air immediately; administer 100% oxygen, even if no injury is apparent, and continue for 30 min. each hour for 6 hours; give artificial respiration if breathing is weak or fails, but do not interrupt oxygen therapy; if victim's coughing prevents use of a mask, use oxygen tent under atmospheric pressure. INGESTION: do NOT induce vomiting. SKIN: wash thoroughly. EYE: flush with running water for at least 15 min. 3.4 TLV-TWA: 0.1 ppm 3.5 TLV-STEL: Not listed. 3.6 TLV-Ceiling: Not listed. 3.7 Toxicity by Ingestion: Grade 3; LD ₅₀ = 50 to 500 mg/kg (rat) 3.8 Toxicity by Inhalation: Currently not available. 3.9 Chronic Toxicity: Causes birth defects in rats (malignant tumors in nervous system). 3.10 Vapor (Gas) Irritancy Characteristics: Vapors cause severe irritation of eye and throat and can cause eye and lung injury. They cannot be tolerated even at low concentration. 3.11 Liquid or Solid Characteristics: Severe skin irritant. Causes second-and third-degree burns on short contact; very injurious to the eyes. 3.12 Odor Threshold: Currently not available 3.13 IDLH Value: 7 ppm 3.14 OSHA PEL-TWA: 1 ppm 3.15 OSHA PEL-STEL: Not listed. 3.16 OSHA PEL-Ceiling: Not listed. 3.17 EPA AEGL: Not listed	

4. FIRE HAZARDS	7. SHIPPING INFORMATION								
4.1 Flash Point: 240°F O.C. 182°F C.C. 4.2 Flammable Limits in Air: Currently not available 4.3 Fire Extinguishing Agents: Water, foam, carbon dioxide or dry chemical 4.4 Fire Extinguishing Agents Not to Be Used: Not pertinent 4.5 Special Hazards of Combustion Products: Flammable, toxic vapors generated 4.6 Behavior in Fire: Not pertinent 4.7 Auto Ignition Temperature: 370°F 4.8 Electrical Hazards: Not pertinent 4.9 Burning Rate: Currently not available 4.10 Adiabatic Flame Temperature: Currently not available 4.11 Stoichiometric Air to Fuel Ratio: 11.9 (calc.) 4.12 Flame Temperature: Currently not available 4.13 Combustion Molar Ratio (Reactant to Product): 6.0 (calc.) 4.14 Minimum Oxygen Concentration for Combustion (MOCC): Not listed	7.1 Grades of Purity: Technical 7.2 Storage Temperature: Ambient 7.3 Inert Atmosphere: No requirement 7.4 Venting: Pressure-vacuum 7.5 IMO Pollution Category: Currently not available 7.6 Ship Type: Currently not available 7.7 Barge Hull Type: Currently not available								
8. HAZARD CLASSIFICATIONS									
8.1 49 CFR Category: Poison 8.2 49 CFR Class: 6.1 8.3 49 CFR Package Group: I 8.4 Marine Pollutant: No 8.5 NFPA Hazard Classification: <table border="0"> <tr> <td>Category</td> <td>Classification</td> </tr> <tr> <td>Health Hazard (Blue).....</td> <td>4</td> </tr> <tr> <td>Flammability (Red).....</td> <td>2</td> </tr> <tr> <td>Instability (Yellow).....</td> <td>0</td> </tr> </table>		Category	Classification	Health Hazard (Blue).....	4	Flammability (Red).....	2	Instability (Yellow).....	0
Category	Classification								
Health Hazard (Blue).....	4								
Flammability (Red).....	2								
Instability (Yellow).....	0								
8.6 EPA Reportable Quantity: 100 pounds 8.7 EPA Pollution Category: B 8.8 RCRA Waste Number: U013 8.9 EPA FWCNA List: Not listed									
9. PHYSICAL & CHEMICAL PROPERTIES									
9.1 Physical State at 15°C and 1 atm: Liquid 9.2 Molecular Weight: 126.13 9.3 Boiling Point at 1 atm: 371.8°F = 188.8°C = 462.0°K 9.4 Freezing Point: -25.2°F = -31.8°C = 241.4°K 9.5 Critical Temperature: Not pertinent 9.6 Critical Pressure: Not pertinent 9.7 Specific Gravity: 1.33 at 15°C (liquid) 9.8 Liquid Surface Tension: 40.1 dynes/cm = 0.0401 N/m at 18°C 9.9 Liquid Water Interfacial Tension: (est.) 20 dynes/cm = 0.02 N/m at 20°C 9.10 Vapor (Gas) Specific Gravity: Not pertinent 9.11 Ratio of Specific Heats of Vapor (Gas): Not pertinent 9.12 Latent Heat of Vaporization: Not pertinent 9.13 Heat of Combustion: Not pertinent 9.14 Heat of Decomposition: Not pertinent 9.15 Heat of Solution: Not pertinent 9.16 Heat of Polymerization: Not pertinent 9.17 Heat of Fusion: Currently not available 9.18 Limiting Value: Currently not available 9.19 Reid Vapor Pressure: Currently not available									

NOTES

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9.20 SATURATED LIQUID DENSITY		9.21 LIQUID HEAT CAPACITY		9.22 LIQUID THERMAL CONDUCTIVITY		9.23 LIQUID VISCOSITY	
Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F	Temperature (degrees F)	British thermal unit inch per hour-square foot-F	Temperature (degrees F)	Centipoise
34	84.309	85	0.385		N	20	3.143
36	84.230	90	0.385		O	30	2.795
38	84.150	95	0.385		T	40	2.497
40	84.059	100	0.385			50	2.241
42	83.980	105	0.385		P	60	2.020
44	83.900	110	0.385		E	70	1.827
46	83.809	115	0.385		R	80	1.659
48	83.730	120	0.385		T	90	1.512
50	83.650	125	0.385		I	100	1.383
52	83.559	130	0.385		N	110	1.268
54	83.480	135	0.385		E	120	1.167
56	83.400	140	0.385		N	130	1.076
58	83.309	145	0.385		T	140	0.995
60	83.230	150	0.385			150	0.923
62	83.150					160	0.858
64	83.059					170	0.800
66	82.980					180	0.747
68	82.900					190	0.699
70	82.809					200	0.655
72	82.730					210	0.616
74	82.650						
76	82.559						

9.24 SOLUBILITY IN WATER		9.25 SATURATED VAPOR PRESSURE		9.26 SATURATED VAPOR DENSITY		9.27 IDEAL GAS HEAT CAPACITY	
Temperature (degrees F)	Pounds per 100 pounds of water	Temperature (degrees F)	Pounds per square inch	Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F
64	2.800	20	0.002	20	0.00004		N
		30	0.002	30	0.00006		O
		40	0.004	40	0.00008		T
		50	0.005	50	0.00012		
		60	0.008	60	0.00018		P
		70	0.011	70	0.00025		E
		80	0.016	80	0.00035		R
		90	0.022	90	0.00048		T
		100	0.031	100	0.00065		I
		110	0.042	110	0.00088		N
		120	0.058	120	0.00117		O
		130	0.077	130	0.00154		T
		140	0.103	140	0.00201		P
		150	0.135	150	0.00260		E
		160	0.176	160	0.00334		R
		170	0.228	170	0.00425		T
		180	0.293	180	0.00537		I
		190	0.373	190	0.00674		N
		200	0.471	200	0.00839		O
		210	0.591	210	0.01038		T
		220	0.737	220	0.01275		P
		230	0.914	230	0.01557		E
		240	1.125	240	0.01890		R