

# Material Safety Data Sheet

## Dimethyl Sulfate

### Section 1: Chemical Product and Company Identification

**Product Name:** Dimethyl Sulfate  
**Chemical Name:** Dimethyl Sulfate  
**Customs Tariff No:** 29209090  
**Synonym Name:** Methyl sulfate; DMS;  
Dimethyl monosulfate, Dimethyl Sulphate  
**Chemical Formula:** C<sub>2</sub>H<sub>6</sub>O<sub>4</sub>S

**Company Information:**  
**Chemtrade International**  
Rm. 201, Unit 3, Building 8, Shijia Garden, No. 93,  
Xiangjiang Road, Qingdao Development Zone,  
Qingdao, Shandong, China 266555  
**Tel:** 0086-532-86893005  
**Fax:** 0086-532-86893005

### Section 2: Composition and Information on Ingredients

#### Composition:

Name	CAS No.	EINECS No.	by weight
Dimethyl Sulfate	77-78-1	201-058-1	98.5% min

### Section 3: Hazards Identification

#### EMERGENCY OVERVIEW

Appearance: clear to slightly hazy liquid. Flash Point: 83 deg C.

**Danger!** Causes eye and skin burns. Causes digestive and respiratory tract burns. May be fatal if inhaled. Harmful if swallowed. May cause allergic skin reaction. **Combustible liquid and vapor.** May cause lung damage. May cause liver and kidney damage. Moisture sensitive. May cause cancer in humans.

**Target Organs:** Kidneys, liver, lungs, reproductive system, and skin.

#### Potential Health Effects

**Eye:** Causes eye burns. May cause irreversible eye injury.

**Skin:** Causes skin burns. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material.

**Ingestion:** Harmful if swallowed. Causes gastrointestinal tract burns. Effects may be delayed 2 to 4 hours.

**Inhalation:** May be fatal if inhaled. Effects may be delayed. Causes severe irritation of upper respiratory tract with coughing, burns, breathing difficulty, and possible coma. May cause lung damage. Inhalation may be fatal as a result of spasm, inflammation, edema of the larynx and bronchi, chemical pneumonitis and pulmonary edema.

**Chronic:** May cause liver and kidney damage. May cause cancer in humans. May cause reproductive and fetal effects.

### Section 4: First Aid Measures

**Eyes:** Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

**Skin:** Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Destroy contaminated shoes.

**Ingestion:** Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

**Inhalation:** Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation.

**Notes to Physician:** Treat symptomatically and supportively.

### Section 5: Fire and Explosion Data

**General Information:** As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by

thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Containers may explode in the heat of a fire. Combustible liquid. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. Contact with metals may evolve flammable hydrogen gas.

**Extinguishing Media:** In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam. For small fires, use dry chemical, carbon dioxide, sand, earth, water spray or regular foam. Cool containers with flooding quantities of water until well after fire is out.

**Flash Point:** 83 deg C ( 181.40 deg F)

**Auto ignition Temperature:** 495 deg C ( 923.00 deg F)

**Explosion Limits, Lower:**3.6

**Upper:** 23.2

**NFPA Rating:** (estimated) Health: 3; Flammability: 2; Instability: 0

### Section 6: Accidental Release Measures

**General Information:** Use proper personal protective equipment as indicated in Section 8.

**Spills/Leaks:** Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Clean up spills immediately, observing precautions in the Protective Equipment section. Scoop up with a non-sparking tool, and then place into a suitable container for disposal. Provide ventilation.

### Section 7: Handling and Storage

**Handling:** Wash thoroughly after handling. Wash hands before eating. Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Do not get in eyes, on skin, or on clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Do not ingest or inhale. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

**Storage:** Keep away from sources of ignition. Store in a cool, dry place. Store in a tightly closed container. Corrosives area. Do not store in metal containers.

### Section 8: Exposure Controls/Personal Protection

**Engineering Controls:** Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

#### Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Dimethyl sulfate	0.1 ppm TWA; Skin - potential significant contribution to overall exposure by the cutaneous route	0.1 ppm TWA; 0.5 mg/m <sup>3</sup> TWA 7 ppm IDLH	1 ppm TWA; 5 mg/m <sup>3</sup> TWA

**OSHA Vacated PELs:** Dimethyl sulfate: 0.1 ppm TWA; 0.5 mg/m<sup>3</sup> TWA

#### Personal Protective Equipment

**Eyes:** Wear chemical splash goggles and face shield.

**Skin:** Wear appropriate protective gloves to prevent skin exposure.

**Clothing:** Wear appropriate protective clothing to prevent skin exposure.

**Respirators:** Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

### Section 9: Physical and Chemical Properties

**Physical State:** Liquid

**Appearance:** clear to slightly hazy

**Odor:** faint odor

**PH:** Not available.

**Vapor Pressure:** 0.5 mm Hg @ 20C

**Vapor Density:** 4.35

**Evaporation Rate:** Not available.

**Viscosity:** Not available.

**Boiling Point:** 188 deg C (decomposes)

**Freezing/Melting Point:**-32 deg C

**Decomposition Temperature:**188 deg C

**Solubility:** Slightly soluble in water.

**Specific Gravity/Density:** 1.33

**Molecular Formula:** C<sub>2</sub>H<sub>6</sub>O<sub>4</sub>S

**Molecular Weight:** 126.13

### Section 10: Stability and Reactivity Data

**Chemical Stability:** Stable under normal temperatures and pressures.

**Conditions to Avoid:** High temperatures, mechanical shock, ignition sources, metals, exposure to moist air or water.

**Incompatibilities with Other Materials:** Strong-oxidizing agents, strong bases, ammonia, and moist air or water.

Can react violently with ammonium hydroxide and sodium azide.

**Hazardous Decomposition Products:** Carbon monoxide, oxides of sulfur, irritating and toxic fumes and gases, carbon dioxide.

**Hazardous Polymerization:** Has not been reported.

### Section 11: Toxicological Information

**RTECS#:**

**CAS# 77-78-1:** WS8225000

**LD50/LC50:**

**CAS# 77-78-1:**

Draize test, rabbit, eye: 50 ug/24H Severe;

Inhalation, mouse: LC50 = 280 mg/m<sup>3</sup>;

Inhalation, rat: LC50 = 45 mg/m<sup>3</sup>/4H;

Oral, mouse: LD50 = 140 mg/kg;

Oral, rat: LD50 = 205 mg/kg;<BR.

**Carcinogenicity:**

**CAS# 77-78-1:**

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans
- **California:** carcinogen, initial date 1/1/88
- **NTP:** Suspect carcinogen
- **IARC:** Group 2A carcinogen

**Epidemiology:** No data available.

**Teratogenicity:** No information available.

**Reproductive Effects:** No information available.

**Mutagenicity:** Known to be mutagenic in animal studies.

**Neurotoxicity:** No information available.

**Other Studies:**

### Section 12: Ecological Information

**Ecotoxicity:** No data available. No information available.

**Environmental:** Terrestrial: Hydrolyzes in damp soil and leaches into groundwater. Aquatic: Hydrolyzes rapidly, half-life 1.2 hours. Atmospheric: Eventually settles out. Not expected to bioconcentrate. Slight biodegradation.

**Physical:** No information available.

**Other:** No information available.

### Section 13: Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

**RCRA P-Series:** None listed.

**RCRA U-Series:**

**CAS# 77-78-1:** waste number U103.

**Section 14: Transport Information**

<b>Shipping Name:</b>	DIMETHYL SULFATE
<b>Hazard Class:</b>	6.1
<b>UN Number:</b>	UN1595
<b>Packing Group:</b>	I

**Section 15: Other Regulatory Information****US FEDERAL****TSCA**

CAS# 77-78-1 is listed on the TSCA inventory.

**Health & Safety Reporting List**

None of the chemicals are on the Health & Safety Reporting List.

**Chemical Test Rules**

CAS# 77-78-1: Testing required by manufacturers, processors

**Section 12b**

CAS# 77-78-1: Section 4

**TSCA Significant New Use Rule**

None of the chemicals in this material have a SNUR under TSCA.

**CERCLA Hazardous Substances and corresponding RQs**

CAS# 77-78-1: 100 lb final RQ; 45.4 kg final RQ

**SARA Section 302 Extremely Hazardous Substances**

CAS# 77-78-1: 500 lb TPQ

**SARA Codes**

CAS # 77-78-1: acute, chronic, flammable.

**Section 313**

This material contains Dimethyl sulfate (CAS# 77-78-1, > 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

**Clean Air Act:**

CAS# 77-78-1 is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

**Clean Water Act:**

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

**OSHA:**

None of the chemicals in this product are considered highly hazardous by OSHA.

**STATE**

CAS# 77-78-1 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

**California Prop 65**

**The following statement(s) is (are) made in order to comply with the California Safe Drinking Water Act:**

**WARNING:** This product contains Dimethyl sulfate, a chemical known to the state of California to cause cancer.

California No Significant Risk Level: None of the chemicals in this product are listed.

**European/International Regulations****European Labeling in Accordance with EC Directives****Hazard Symbols:**

T+ C

**Risk Phrases:**

R 25 Toxic if swallowed.

R 26 Very toxic by inhalation.

R 34 Causes burns.

R 43 May cause sensitization by skin contact.

R 45 May cause cancer.

**Safety Phrases:**

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 53 Avoid exposure - obtain special instructions before use.

**WGK (Water Danger/Protection)**

CAS# 77-78-1: 2

**Canada - DSL/NDSL**

CAS# 77-78-1 is listed on Canada's DSL List.

**Canada - WHMIS**

This product has a WHMIS classification of B3, D1A, D2A, E.

**Canadian Ingredient Disclosure List**

CAS# 77-78-1 is listed on the Canadian Ingredient Disclosure List.

**Section 16: Other Information**

**MSDS Creation Date:** 2/26/2001

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Chemtrade International be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Chemtrade International has been advised of the possibility of such damages.