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MATERIAL SAFETY DATA SHEET

Version 2.0

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Section 1 - Product and Company Information

Product Name: Methanesulfonic Acid 99%

Product Number: C000016

Company: DSL Chemicals (Shanghai) Co., Ltd.

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Section 2 - Composition, Information on Ingredients

Substance Name

CAS #

Methanesulfonic Acid

75-75-2

99%

Formula: CH₄O₃S

Molecular Weight: 96.10g/mol

Section 3 - Hazards Identification

OSHA Haz Com: CFR 1910.1200:

Acute Toxicity - Oral [Category 3]

Acute Toxicity - Dermal [Category 4]

Acute Toxicity - Inhalation [Category 4]

Eye Damage/Irritation [Category 1]

Toxic to Reproduction [Category 2]

Corrosive to Metals [Category 1]

Aquatic Hazard (Acute) [Category 3]

Skin Corrosion/Irritation [Category 1B]

Danger!

Causes serious eye damage

Causes severe skin burns and eye damage

Harmful in contact with skin

Harmful if inhaled

May be corrosive to metals

Suspected of damaging fertility or the unborn child

Toxic if swallowed

Harmful to aquatic life

Signal word:

Hazard Statement(s):



Pictogram(s) or Symbol(s):

Precautionary Statement(s):

[Prevention]

Do not eat, drink or smoke when using this product. Wash hands and face thoroughly after handling. Wear protective gloves and protective clothing. Avoid breathing fume, mist, vapors or

spray. Use only outdoors or in a well-ventilated area. Do not breathe dusts or mists. Wear protective gloves, protective clothing, eye protection and face protection. Wear eye protection. Wear face protection (full length face shield). Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep only in original container.

[Response]

If swallowed: Immediately call a poison center or doctor. Rinse mouth. If on skin: Wash with plenty of water. Call a poison center or doctor if you feel unwell. Take off contaminated clothing and wash it before reuse. If inhaled: Remove person to fresh air and keep comfortable for breathing. If swallowed: Rinse mouth. Do NOT induce vomiting. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Wash contaminated clothing before reuse. Immediately call a poison center or doctor. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If exposed: Call a poison center or doctor. Absorb spillage to prevent material damage.

[Storage]

Store locked up. Store in corrosive resistant container with a resistant inner liner.

[Disposal]

Dispose of contents and container in accordance with US EPA guidelines for the classification and determination of hazardous waste listed in 40 CFR 261.3. (See Section 13)

Section 4 - First Aid Measures

Inhalation:

Immediately call a poison center or doctor. Effects of exposure (inhalation) to substance may be delayed. Inhalation of vapors or contact with substance will result in contamination and potential harmful effects. Move victim to fresh air. Give artificial respiration if victim is not breathing. Administer oxygen if breathing is difficult. Keep victim warm and quiet. Treat symptomatically and supportively. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

Skin contact:

For severe burns, immediate medical attention is required. Immediately call a poison center or doctor. Effects of exposure (skin contact) to substance may be delayed. Remove and wash contaminated clothing before re-use. Remove and isolate contaminated clothing and shoes. In case of contact with substance, immediately flush skin with running water for at least 20 minutes. Treat symptomatically and supportively. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

Eye contact:

IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. Eye contact with vapors or substance may cause severe injury, burns, or death. Call emergency medical service. Move victim to fresh air. Check for and remove any contact lenses. Keep victim warm and quiet. Treat symptomatically and supportively. Effects of exposure to substance may be delayed. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

Ingestion:

Toxic if swallowed. Do not induce vomiting without medical advice. Effects of exposure (ingestion) to substance may be delayed. Call a physician or Poison Control Center immediately. Do not use mouth-to-mouth method if victim ingested the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Loosen tight clothing such as a collar, tie, belt or waistband. If a person vomits place them in the recovery position so that vomit will not reenter the mouth and throat. Rinse mouth. Keep victim warm and quiet. Treat symptomatically and supportively. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

Symptoms/effects:

Acute: Pain. Redness.

Delayed: No data available

Immediate medical attention:

WARNING: It might be dangerous to the person providing aid to give mouth-to-mouth

respiration, because the inhaled material is toxic. **WARNING:** It might be hazardous to the person providing aid to give mouth-to-mouth respiration, because the inhaled material is corrosive. **CAUTION:** Victim may be a source of contamination. For severe burns, immediate medical attention is required. If breathing has stopped, perform artificial respiration. Use first aid treatment according to the nature of the injury. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

Section 5 - Fire Fighting Measures

Suitable extinguishing media:

Dry chemical, CO₂ or water spray. Consult with local fire authorities before attempting large scale fire fighting operations.

Specific hazards arising from the chemical

Hazardous combustion products:

These products include: Carbon oxides Silicates

Other specific hazards:

Closed containers may explode from heat of a fire.

Special precautions for fire-fighters:

Use water spray or fog; do not use straight streams. Dike fire-control water for later disposal; do not scatter the material. Containers may explode when heated. Move containers from fire area if you can do it without risk.

Special protective equipment for fire-fighters:

Wear positive pressure self-contained breathing apparatus (SCBA). Structural fire fighters' protective clothing provides limited protection in fire situations ONLY; it may not be effective in spill situations. Wear chemical protective clothing which is specifically recommended by the manufacturer. It may provide little or no thermal protection.

Section 6 - Accidental Release Measures

Personal precautions:

Avoid contact with skin, eyes, and clothing. Keep people away from and upwind of spill/leak. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing (Section 8). Warn unnecessary personnel to move away. Stop leak if you can do it without risk. Ensure adequate ventilation. Isolate the hazard area and deny entry to unnecessary and unprotected personnel.

Personal protective equipment:

Wear eye protection (splash goggles) and face protection (full length face shield). Wear protective clothing (chemical resistant suit and chemical resistant boots). Vapor respirator. Be sure to use a MSHA/NIOSH approved respirator or equivalent. Wear protective gloves (nitrile).

Emergency procedures:

Do not clean-up or dispose except under supervision of a specialist. In case of a spill and/or a leak, always shut off any sources of ignition, ventilate the area, and exercise caution. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Warn personnel to move away. Prevent entry into sewers, basements or confined areas; dike if needed.

Methods and materials for containment and cleaning up:

ELIMINATE all ignition sources (no smoking, flares, sparks, or flames in immediate area). Stop leak if without risk. Absorb with an inert material and put the spilled material in an appropriate waste disposal container. Use clean non-sparking tools to collect absorbed material. Dike far ahead of spill; use dry sand to contain the flow of material. Ventilate the area.

Environmental precautions:

Keep away from living quarters. Environmental hazard. Do not let product enter drains. Prevent further leakage or spillage if safe to do so. Water runoff can cause environmental damage. Prevent entry into sewers, basements or confined areas; dike if needed.

Section 7 - Handling and Storage

Precautions for safe handling:

Do NOT breath gas, fumes, vapor, or spray. Manipulate under an adequate fume hood. Do not

ingest. Avoid contact with skin and eyes. Avoid contact with skin. Avoid contact - obtain special instructions before use. Avoid prolonged or repeated exposure. Normal measures for preventive fire protection. May corrode metallic surfaces. Good general ventilation should be sufficient to control airborne levels. Keep container dry. Handle and open container with care. Wear suitable protective clothing, gloves and eye/face protection. When using do not eat, drink, or smoke. Keep away from sources of ignition.

Conditions for safe storage:

Store locked up. Keep containers tightly closed in a cool, well-ventilated place. Store in corrosive resistant container with a resistant inner liner. Keep away from incompatibles. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Avoid prolonged storage periods. Store under inert gas (e.g. Argon). Hygroscopic material, store in a tightly sealed container. Store in refrigerator.

Storage incompatibilities:

Bases, Store away from oxidizing agents

Section 8 - Exposure Controls, Personal Protection

Exposure limits:

No data available

Appropriate engineering controls:

Handle only in a fully enclosed system and equipment. Good general ventilation should be sufficient to control airborne levels. Ventilation is normally required when handling or using this product. Eyewash fountains should be provided in areas where there is any possibility that workers could be exposed to the substance. Follow safe industrial engineering/laboratory practices when handling any chemical.

Personal protective equipment

Respiratory protection:

Vapor respirator. Be sure to use a MSHA/NIOSH approved respirator or equivalent.

Hand protection:

Wear protective gloves.

Eye protection:

Splash goggles.

Skin and body protection:

Wear protective clothing (chemical resistant suit and chemical resistant boots).

Section 9 - Physical and Chemical Properties

Physical state (20°C):	Liquid
Form:	Clear
Color:	Colorless or light yellow
Odor:	Fruity
Odor threshold:	No data available
Melting point/freezing point:	18°C (Freezing point) (64°F)
Boiling point/range:	122°C (252°F)/0.1kPa
Decomposition temperature:	No data available
Relative density:	1.48
Kinematic viscosity:	No data available
Partition coefficient:	-2.38
n-octanol/water (log Pow)	
Flash point:	233°C (451°F)
Flammability (solid, gas):	No data available
pH:	No data available
Vapor pressure:	0.057Pa/25°C
Vapor density:	No data available
Dynamic Viscosity:	No data available
Evaporation rate:	No data available
(Butyl Acetate = 1)	
Autoignition temperature:	535°C (995°F)

Flammability or explosive limits:
Lower: 11.4%
Upper: 24.3%
Solubility (ies):
Water: Miscible
Soluble: Ether, Alcohols
Slightly soluble: Benzene
Very slightly soluble: Toluene
Insoluble: Hexane

Section 10 - Stability and Reactivity

Reactivity: Corrodes in contact with metals.
Chemical Stability: Heat sensitive.
Possibility of Hazardous Reactions: No hazardous reactivity has been reported.
Conditions to avoid: Heat sensitive.
Incompatible materials: Oxidizing agents
Hazardous Decomposition Products: No data available

Section 11 - Toxicological Information

RTECS Number: PB1140000
Acute Toxicity:
ori-rat LD50:200 mg/kg ihi-rat LC:>330 ppm/6H
skn-rbt LD50:>1000 mg/kg
Skin corrosion/irritation:
No data available
Serious eye damage/irritation:
eye-rbt 0.1 mL SEV
Respiratory or skin sensitization:
No data available
Germ cell mutagenicity:
No data available
Carcinogenicity:
No data available
IARC: No data available NTP: No data available OSHA: No data available
Reproductive toxicity:
No data available
Routes of Exposure: Inhalation, Eye contact, Ingestion, Skin contact.
Symptoms related to exposure:
Overexposure may result in serious illness or death. Skin contact may produce burns. Skin contact may result in inflammation; characterized by itching, scaling, reddening, or occasionally blistering. Eye contact can result in corneal damage or blindness.
Potential Health Effects:
No specific information available; skin and eye contact may result in irritation. May be harmful if inhaled or ingested.
Target organ(s): No data available

Section 12 - Ecological Information

Ecotoxicity
Fish: 96h LC50:73 mg/L (Oncorhynchus mykiss)
Crustacea: 48h EC50:12 mg/L (Daphnia pulex)
Algae: 96h EC50:7.2 mg/L (Selenastrum capricornutum)
Persistence and degradability: 106 % (by BOD), 89 % (by TOC), 89 % (by CE)
Bioaccumulative potential (BCF): No data available
Mobility in soil: No data available
Partition coefficient: -2.38

n-octanol/water (log Pow)
Soil adsorption (Koc): 1
Henry's Law: 1.3×10^{-3}
constant (PaM³/mol)

Section 13 - Disposal Considerations

Disposal of product:

Recycle to process if possible. It is the generator's responsibility to comply with Federal, State and Local rules and regulations. You may be able to dissolve or mix material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber system. This section is intended to provide assistance but does not replace these laws, nor does compliance in accordance with this section ensure regulatory compliance according to the law. US EPA guidelines for Identification and Listing of Hazardous Waste are listed in 40 CFR Parts 261. The product should not be allowed to enter the environment, drains, water ways, or the soil.

Disposal of container:

Dispose of as unused product. Do not re-use empty containers.

Other considerations:

Observe all federal, state and local regulations when disposing of the substance.

Section 14 - Transport Information

DOT (US)

UN number:	Proper Shipping Name:	Class or Division:	Packing Group:
UN2586	Methanesulfonic Acid	8 Corrosive material	III

IATA

UN number:	Proper Shipping Name:	Class or Division:	Packing Group:
UN2586	Methanesulfonic Acid	8 Corrosive material	III

IMDG

UN number:	Proper Shipping Name:	Class or Division:	Packing Group:
UN2586	Methanesulfonic Acid	8 Corrosive material	III

EmS number: F-A, S-B

Section 15 - Regulatory Information

Toxic Substance Control Act (TSCA 8b.):

This product is ON the EPA Toxic Substances Control Act (TSCA) inventory.

US Federal Regulations

CERCLA Hazardous substance and Reportable Quantity:

SARA 313: Not Listed

SARA 302: Not Listed

State Regulations

State Right-to-Know

Massachusetts Not Listed

New Jersey Listed

Pennsylvania Not Listed

California Proposition 65: Not Listed

Other Information

NFPA Rating: HMIS Classification:

Health: 3	Health: 3
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Flammability: 1	Flammability: 1
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Instability: 1	Instability: 1
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International Inventories

WHMIS hazard class:

E: Corrosive material.

D1B: Materials causing immediate and serious toxic effects. (Toxic)

D2A: Materials causing other toxic effects. (Very Toxic)

Canada: DSL

On DSL

EC-No:

200-898-6

Notice Through Official Gazettes Reference Number:
ENCS: (2)-1582

Section 16 - Additional Information

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 way shall the company 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 the company has been advised of the possibility of such damages.