Chemical Safety Data Sheet MSDS / SDS

# Diethyl sulphate SDS

Revision Date:2024-04-25 Revision Number:1



## SECTION 1: Identification of the substance/mixture and of the company/undertaking

### Product identifier

Product name: Diethyl sulphate

CAS: 64-67-5

### Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses: For R&D use only. Not for medicinal, household or other use.

Uses advised against: none

### Company Identification

Company: Chemicalbook.in

Address: 5 vasavi Layout Basaveswara Nilayam Pragathi Nagar Hyderabad, India -500090

Telephone: +91 9550333722

## SECTION 2: Hazards identification

### Classification of the substance or mixture

Acute toxicity - Category 4, Oral
Acute toxicity - Category 4, Dermal

Skin corrosion, Sub-category 1B
Acute toxicity - Category 4, Inhalation
Germ cell mutagenicity, Category 1B
Carcinogenicity, Category 1B

**GHS label elements, including precautionary statements**

Pictogram(s)

Signal word Danger

**Hazard statement(s)**

H302 Harmful if swallowed
H312 Harmful in contact with skin
H314 Causes severe skin burns and eye damage
H332 Harmful if inhaled
H340 May cause genetic defects
H350 May cause cancer

**Precautionary statement(s)**

**Prevention**

P264 Wash ... thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P271 Use only outdoors or in a well-ventilated area.
P203 Obtain, read and follow all safety instructions before use.

**Response**

P301+P317 IF SWALLOWED: Get medical help.
P330 Rinse mouth.
P302+P352 IF ON SKIN: Wash with plenty of water/...
P317 Get medical help.
P321 Specific treatment (see ... on this label).
P362+P364 Take off contaminated clothing and wash it before reuse.
P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P363 Wash contaminated clothing before reuse.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P316 Get emergency medical help immediately.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P318 IF exposed or concerned, get medical advice.

### Storage

P405 Store locked up.

### Disposal

P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

### Other hazards which do not result in classification

no data available

## SECTION 3: Composition/information on ingredients

### Substance

| | |
|---|---|
| Chemical name: | Diethyl sulphate |
| Common names and synonyms: | Diethyl sulphate |
| CAS number: | 64-67-5 |
| EC number: | 200-589-6 |
| Concentration: | 100% |

## SECTION 4: First aid measures

### Description of necessary first-aid measures

### If inhaled

Fresh air, rest. Half-upright position. Refer immediately for medical attention.

### Following skin contact

Remove contaminated clothes. Rinse skin with plenty of water or shower for at least 15 minutes. Refer immediately for medical attention.

### Following eye contact

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

### Following ingestion

Rinse mouth. Do NOT induce vomiting. Give nothing to drink. Refer immediately for medical attention.

### Most important symptoms/effects, acute and delayed

May be fatal if inhaled, swallowed or absorbed through skin. Inhalation causes nausea and vomiting. Causes burns to skin and eyes. Ingestion may cause nausea, vomiting abdominal pain and collapse. (USCG, 1999)

### Indication of immediate medical attention and special treatment needed, if necessary

For basic treatment: Establish a patent airway. Suction if necessary. Watch for signs of respiratory insufficiency and assist ventilations if necessary. Administer oxygen by nonrebreather mask at 10 to 15 L/min. Monitor for pulmonary edema and treat if necessary. Anticipate seizures and treat if necessary. Monitor for shock and treat if necessary. For eye contamination, flush eyes immediately with water. Irrigate each eye continuously with normal saline during transport. Do not use emetics. For ingestion, rinse mouth and administer 5 ml/kg up to 200 ml of water for dilution if the patient can swallow, has a strong gag reflex, and does not drool. Administer activated charcoal. Cover skin burns with sterile dressings after decontamination. Sulfur and related compounds

## SECTION 5: Firefighting measures

### Suitable extinguishing media

Use dry chemical, foam, carbon dioxide, or water spray. Use water spray to keep fire-exposed containers cool. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products.

### Specific hazards arising from the chemical

Special Hazards of Combustion Products: Highly toxic fumes contaning sulfur oxides may be generated along with thermal decomposition products such as ethyl ether and ethylene. Sulfuric acid may be produced in the presence of moisture. Behavior in Fire: It burns to yield highly, toxic sulfur oxides. Above 100°C, it undergoes thermal decomposition to yield ethyl ether, ethylene and sulfur oxides which may cause an explosion in closed containers or confined spaces. (USCG, 1999)

### Special protective actions for fire-fighters

Use water spray, powder, foam, carbon dioxide.

## SECTION 6: Accidental release measures

### Personal precautions, protective equipment and emergency procedures

Personal protection: complete protective clothing including self-contained breathing apparatus. Do NOT let this chemical enter the environment. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

### Environmental precautions

Personal protection: complete protective clothing including self-contained breathing apparatus. Do NOT let this chemical enter the environment. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

### Methods and materials for containment and cleaning up

PRECAUTIONS FOR "CARCINOGENS": A high-efficiency particulate arrestor (HEPA) or charcoal filters can be used to minimize amt of carcinogen in exhausted air ventilated safety cabinets, lab hoods, glove boxes or animal rooms ... Filter housing that is designed so that used filters can be transferred into plastic bag without contaminating maintenance staff is avail commercially. Filters should be placed in plastic bags immediately after removal ... The plastic bag should be sealed immediately ... The sealed bag should be labelled properly ... Waste liquids ... should be placed or collected in proper containers for disposal. The lid should be secured & the bottles properly labelled. Once filled, bottles should be placed in plastic bag, so that outer surface ... is not contaminated ... The plastic bag should also be sealed & labelled. ... Broken glassware ... should be decontaminated by solvent extraction, by chemical destruction, or in specially designed incinerators. Chemical Carcinogens

## SECTION 7: Handling and storage

### Precautions for safe handling

NO open flames. See Chemical Dangers. Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

### Conditions for safe storage, including any incompatibilities

Separated from food and feedstuffs. Dry. Well closed. Keep in a well-ventilated room. Store in an area without drain or sewer access.PRECAUTIONS FOR "CARCINOGENS": Storage site should be as close as practical to lab in which carcinogens are to be used, so that only small quantities required for ... expt need to be carried. Carcinogens should be kept in only one section of cupboard, an explosion-proof refrigerator or freezer (depending on chemicophysical properties ...) that bears appropriate label. An inventory ... should be kept, showing quantity of carcinogen & date it was acquired ... Facilities for dispensing ... should be contiguous to storage area. Chemical Carcinogens

## SECTION 8: Exposure controls/personal protection

### Control parameters

### Occupational Exposure limit values

MAK: skin absorption (H); carcinogen category: 2; germ cell mutagen group: 2

### Biological limit values

no data available

### Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

### Individual protection measures, such as personal protective equipment (PPE)

### Eye/face protection

Wear face shield or eye protection in combination with breathing protection.

### Skin protection

Protective gloves. Protective clothing.

### Respiratory protection

Use ventilation, local exhaust or breathing protection.

### Thermal hazards

no data available

## SECTION 9: Physical and chemical properties and safety characteristics

| | |
|---|---|
| Physical state: | Liquid. Oily. |
| Colour: | Colourless but darkens with age. |
| Odour: | Peppermint odor |
| Melting point/freezing point: | -25 °C. Remarks:No data about the pressure. |
| Boiling point or initial boiling point and boiling range: | 209.5 °C. Atm. press.:760 mm Hg. |
| Flammability: | Combustible. Gives off irritating or toxic fumes (or gases) in a fire. |
| Lower and upper explosion limit/flammability limit: | no data available |
| Flash point: | 104 °C. |
| Auto-ignition temperature: | 436 °C. Remarks:No data about pressure. |
| Decomposition temperature: | 209°C |
| pH: | no data available |
| Kinematic viscosity: | dynamic viscosity (in mPa s) = 1.79. Temperature:20°C. |
| Solubility: | 7 g / l (20 °C) |
| Partition coefficient n-octanol/water: | log Pow = 1.14. Remarks:No data on temperature and pH. |
| Vapour pressure: | 0.212 mm Hg. Temperature:25 °C. Remarks:Corresponding to 28.26 Pa. |
| Density and/or relative density: | 1.172 g/cm3. Temperature:25 °C. |
| Relative vapour density: | 5.3 (vs air) |

| | |
|---|---|
| Particle characteristics: | no data available |

## SECTION 10: Stability and reactivity

### Reactivity

Decomposes on heating. This produces flammable and toxic fumes. Reacts violently with ammonia, strong oxidants, strong bases and powdered metals. This generates fire hazard. Reacts with water and moisture. This produces sulfuric acid and ethanol.

### Chemical stability

no data available

### Possibility of hazardous reactions

Combustible when exposed to heat or flame. The presence of moisture in a metal container of DIETHYL SULFATE caused the formation of sulfuric acid which reacts with the metal to release hydrogen which pressurized and exploded the container [Chem. Abst. 28:2908(1934)].

### Conditions to avoid

no data available

### Incompatible materials

React violently with 3,8-dinitro-9-phenylphenanthridine plus water. Reaction with iron plus water forms explosive hydrogen gas.

### Hazardous decomposition products

Decomposes at elevated temperature forming ethyl ether, which is more flammable than the material itself.

## SECTION 11: Toxicological information

### Acute toxicity

Oral: LD50 - rat - 880 mg/kg bw.

Inhalation: no data available

Dermal: LD50 - rabbit - 600 µL/kg.

### Skin corrosion/irritation

no data available

### Serious eye damage/irritation

no data available

### Respiratory or skin sensitization

no data available

### Germ cell mutagenicity

no data available

### Carcinogenicity

Evaluation: There is inadequate evidence for the carcinogenicity in humans of diethyl sulfate. There is sufficient evidence for the carcinogenicity of diethyl sulfate in experimental animals. Diethyl sulfate is probably carcinogenic to humans (2A). In making the overall evaluation, the Working Group took into account diethyl sulfate is a strong direct alkylating agent which ethylates DNA and that as a result, it is genotoxic in virtually all test systems examined including potent effects in somatic and germ cells of mammals exposed in vivo.

### Reproductive toxicity

No information is available on the reproductive or developmental effects of diethyl sulfate in humans. After a single subcutaneous dose to pregnant rats, malignant tumors of the nervous system were reported in the offspring. (,,5)

### STOT-single exposure

The substance is corrosive to the eyes, skin and respiratory tract. Inhalation may cause lung oedema. See Notes. The effects may be delayed. Medical observation is indicated.

### STOT-repeated exposure

This substance is probably carcinogenic to humans. May cause heritable genetic damage to human germ cells.

### Aspiration hazard

No indication can be given about the rate at which a harmful concentration of this substance in the air is reached.

## SECTION 12: Ecological information

### Toxicity

Toxicity to fish: no data available

Toxicity to daphnia and other aquatic invertebrates: no data available

Toxicity to algae: Cladophora crispata.

Toxicity to microorganisms: no data available

### Persistence and degradability

Diethylsulfate, present at 100 mg/l, achieved 89% of its theoretical BOD after 4 weeks using an activated sludge inoculum at 30 mg/l and the Japanese MITI test(1).

### Bioaccumulative potential

Based upon the rapid rate of hydrolysis for diethylsulfate in aqueous environments(1), bioconcentration in aquatic organisms is expected to be low(SRC).

### Mobility in soil

Based upon the rapid hydrolysis of diethylsulfate in aqueous environments(1), adsorption to soil and leaching are not expected to be important fate processes(SRC).

### Other adverse effects

no data available

## SECTION 13: Disposal considerations

### Disposal methods

### Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

### Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

## SECTION 14: Transport information

### UN Number

ADR/RID: UN1594 (For reference only, please check.)
IMDG: UN1594 (For reference only, please check.)
IATA: UN1594 (For reference only, please check.)

### UN Proper Shipping Name

ADR/RID: DIETHYL SULPHATE (For reference only, please check.)
IMDG: DIETHYL SULPHATE (For reference only, please check.)
IATA: DIETHYL SULPHATE (For reference only, please check.)

### Transport hazard class(es)

ADR/RID: 6.1 (For reference only, please check.)
IMDG: 6.1 (For reference only, please check.)
IATA: 6.1 (For reference only, please check.)

### Packing group, if applicable

ADR/RID: II (For reference only, please check.)
IMDG: II (For reference only, please check.)
IATA: II (For reference only, please check.)

### Environmental hazards

ADR/RID: No
IMDG: No
IATA: No

**Special precautions for user**

no data available

**Transport in bulk according to IMO instruments**

no data available

## SECTION 15: Regulatory information

**Safety, health and environmental regulations specific for the product in question**

**European Inventory of Existing Commercial Chemical Substances (EINECS)**

Listed.

**EC Inventory**

Listed.

**United States Toxic Substances Control Act (TSCA) Inventory**

Listed.

**China Catalog of Hazardous chemicals 2015**

Listed.

**New Zealand Inventory of Chemicals (NZIoC)**

Listed.

**(PICCS)**

Listed.

**Vietnam National Chemical Inventory**

Listed.

**IECSC)**

Listed.

**Korea Existing Chemicals List (KECL)**

Listed.

## SECTION 16: Other information

**Abbreviations and acronyms**

CAS: Chemical Abstracts Service

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

RID: Regulation concerning the International Carriage of Dangerous Goods by Rail

IMDG: International Maritime Dangerous Goods

IATA: International Air Transportation Association

TWA: Time Weighted Average

STEL: Short term exposure limit

LC50: Lethal Concentration 50%

LD50: Lethal Dose 50%

EC50: Effective Concentration 50%

**References**

IPCS - The International Chemical Safety Cards (ICSC), website: http://www.ilo.org/dyn/icsc/showcard.home

HSDB - Hazardous Substances Data Bank, website: https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm

IARC - International Agency for Research on Cancer, website: http://www.iarc.fr/

eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en

CAMEO Chemicals, website: http://cameochemicals.noaa.gov/search/simple

ChemIDplus, website: http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp

ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: http://www.phmsa.dot.gov/hazmat/library/erg

Germany GESTIS-database on hazard substance, website: http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp

ECHA - European Chemicals Agency, website: https://echa.europa.eu/

## Other Information

The symptoms of lung oedema often do not become manifest until a few hours have passed and they are aggravated by physical effort. Rest and medical observation are therefore essential.