

Section 1. Product and Company Identification

Product Name Diethyl Sulfide
CAS Number 352-93-2

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Section 2. Hazards Identification

Classification of the substance or mixture
Classification (Regulation (EC) No 1272/2008)

Flammable liquids, Category 2

H225: Highly flammable liquid and vapor.

Eye irritation, Category 2

H319: Causes serious eye irritation.

Chronic aquatic toxicity, Category 3

H412: Harmful to aquatic life with long lasting effects.

Classification (67/548/EEC, 1999/45/EC)

Highly flammable

R11: Highly flammable.

Harmful

R52/53: Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

GHS Label Elements

Pictograms:



Signal word: DANGER

Hazard and precautionary statements

Hazard Statements

H225 Highly flammable liquid and vapor.

H319 Causes serious eye irritation.

H412 Harmful to aquatic life with long lasting effects.



Precautionary Statements

Prevention

- P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
- P233 Keep container tightly closed.
- P240 Ground/bond container and receiving equipment.
- P243 Take precautionary measures against static discharge.
- P264 Wash hands thoroughly after handling.
- P261 Avoid breathing dust/fume/gas/mist/vapors/spray.
- P273 Avoid release to the environment.
- P280 Wear protective gloves/protective clothing/eye protection/face protection.

Response

- P303 + P361 + P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
- P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P337 + P313 If eye irritation persists: Get medical advice/attention.
- P362 Take off contaminated clothing and wash before reuse.
- P370 + P378 In case of fire: Use dry sand, dry chemical, or alcohol-resistant foam for extinction

Section 3. Composition / Information on Ingredients

Common Name	Diethyl Sulfide
Synonym(s)	1,1'-Thiobisethane; DES; 3-thiapentane; Diethyl thioether; Ethylthioethane
Formula	C ₄ H ₁₀ S
CAS Number	352-93-2

COMPONENT	CAS NUMBER	CONCENTRATION
Diethyl Sulfide	352-93-2	97 - 100% wt.

Section 4. First Aid Measures

General advice: Move out of dangerous area. Show this material safety data sheet to the doctor in attendance. Material may produce a serious, potentially fatal pneumonia if swallowed or vomited.

Inhalation: Consult a physician after significant exposure. If unconscious place in recovery position and seek medical advice.

Skin contact: If on skin, rinse well with water. If on clothes, remove clothes.

Eye contact: Flush eyes with water as a precaution. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.

Ingestion: Keep respiratory tract clear. Do NOT induce vomiting. Do not give milk or alcoholic beverages. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician. Take victim immediately to hospital.

Section 5. Firefighting Measures

Flash point: -10 to -4°C (14 - 25°F) at 100,4 kPa

Auto-ignition temperature: 189 - 199°C (372 - 390°F) at 101.45 - 102.39 kPa

Suitable extinguishing media: Alcohol-resistant foam. Carbon dioxide (CO₂). Dry chemical.

Unsuitable extinguishing media: High volume water jet.

Specific hazards during firefighting: Do not allow run-off from firefighting to enter drains or water courses.

Special protective equipment for firefighters: Wear self-contained breathing apparatus for firefighting if necessary.

Further information: 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. For safety reasons in case of fire, cans should be stored separately in closed containments. Use a water spray to cool fully closed containers.

Fire and explosion protection: Do not spray on an open flame or any other incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use only explosion-proof equipment. Keep away from open flames, hot surfaces, and sources of ignition.

Hazardous decomposition products: Carbon oxides. Sulfur oxides.

Section 6. Accidental Release Measures

Personal precautions: Use personal protective equipment. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.

Environmental precautions: Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.

Methods for cleaning up: Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local/national regulations.

Section 7. Handling and Storage

Handling

Advice on safe handling: In case of an accident, this substance must be handled under Strictly Controlled Conditions (SCC) in accordance with REACH regulation Article 17(3) for on-site isolated intermediates. Avoid formation of aerosol. Do not breathe vapors/dust. Avoid exposure - obtain special instructions before use. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Take precautionary measures against static discharges. Provide sufficient air exchange and/or exhaust in work rooms. Open drum carefully as content may be under pressure. Dispose of rinse water in accordance with local and national regulations. NORMS based Radon, a radioactive gas, may be present as a trace component in natural gas, natural gas liquids and petrochemicals derived from natural gas. Special precautions should be taken when entering or dismantling equipment in this type of service. Equipment should be checked



externally while in service for gamma radiation above background levels. This equipment may contain internal surface deposits of radioactive radon decay products. Minimize unnecessary exposures to these radioactive deposits. Exposures can be reduced by allowing a 4 hour idle (no flow) period before entering or dismantling equipment. During this time the short lived decay products will decay. Longer lived radio nuclides (Pb-210, Bi-210 and Po-210) may be present. Avoid direct skin contact with deposits of radioactivity on surfaces. Avoid generation of dust, smoke or fumes in the work area or if they cannot be avoided, wear a tested and certified respirator for radioactive dusts. Smoking, eating and drinking should be prohibited when working with this equipment. Employees should wash thoroughly with soap and water and discard contaminated clothing after entering or handling equipment having radioactive deposits.

Advice on protection against fire and explosion: Do not spray on an open flame or any other incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use only explosion-proof equipment. Keep away from open flames, hot surfaces and sources of ignition.

Storage

Requirements for storage areas and containers: No smoking. 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. Observe label precautions. Electrical installations/working materials must comply with the technological safety standards.

Section 8. Exposure Controls / Personal Protection

Engineering measures

The substance is registered as an On-site isolated intermediate with Strictly Controlled Conditions (SCC) defined in Article 17(3) of Regulation EC No. 1907/2006 and must therefore be handled as such.

Adequate ventilation to control airborne concentrations below the exposure guidelines/limits. Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

Personal protective equipment

Respiratory protection: Wear a supplied-air NIOSH approved respirator unless ventilation or other engineering controls are adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure. Wear a NIOSH approved respirator that provides protection when working with this material if exposure to harmful levels of airborne material may occur, such as: Air-Purifying Respirator for Organic Vapors. Use a positive pressure, air-supplying respirator if there is potential for uncontrolled release, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection.

Hand protection: The suitability for a specific workplace should be discussed with the producers of the protective gloves. Please observe the instructions regarding permeability and breakthrough

time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

Eye protection: Eye wash bottle with pure water. Tightly fitting safety goggles.

Skin and body protection: Choose body protection according to the amount and concentration of the dangerous substance at the work place. Wear as appropriate: Flame retardant antistatic protective clothing. Workers should wear antistatic footwear.

Hygiene measures: When using, do not eat or drink. When using, do not smoke. Wash hands before breaks and at the end of workday.

The substance is registered as an On-site isolated intermediate with Strictly Controlled Conditions (SCC) defined in Article 17(3) of Regulation EC No. 1907/2006 and must therefore be handled as such.

Section 9. Physical and Chemical Properties

Information on basic physical and chemical properties

Appearance

Form: Liquid

Physical state: Liquid

Color: Clear

Odor: Pungent, garlic-like

Flash point: -10 to -4°C (14 - 25°F) at 100.4 kPa

Lower explosion limit: No data available

Upper explosion limit: No data available

Oxidizing properties: No

Auto-ignition temperature: 189 - 199°C (372 - 390°F) at 101.45 - 102.39 kPa

Molecular formula: C₄H₁₀S

Molecular Weight: 90.2 g/mol

pH: No data available

Pour point: No data available

Melting point/range: -103.9°C (-155.0°F) at 103.25 hPa

Boiling point/boiling range: 92.1°C (197.8°F)

Vapor pressure: 10.00 kPa at 30.3°C (86.5°F)

Density: 0.84 g/cm³ at 20°C (68°F)

Water solubility: 3.07 g/l at 25°C (77°F)

Partition coefficient (n-Octanol/Water): log Pow: 1.95

Solubility in other solvents: Negligible

Viscosity, dynamic: 0.422 mPa*s at 20°C (68°F)

Relative vapor density: 3.1 (Air = 1.0)

Evaporation rate: No data available

Percent volatile: > 99%

Section 10. Stability and Reactivity

Chemical stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Possibility of hazardous reactions

Conditions to avoid: Heat, flames, and sparks.

Other data: No decomposition if stored and applied as directed.

Section 11. Toxicological Information

Acute oral toxicity

LD50: > 5.000 mg/kg

Species: Rat

Sex: Male and female

Method: OECD Test Guideline 401

Information given is based on data obtained from similar substances.

Acute inhalation toxicity

LC50: 102 mg/l

Exposure time: 4 h

Species: rat

Sex: Male and female

Method: OECD Test Guideline 403

Information given is based on data obtained from similar substances.

Acute dermal toxicity

LD50: > 2.000 mg/kg

Sex: Male and female

Method: OECD Test Guideline 402

Information given is based on data obtained from similar substances.

Skin irritation: Slight irritation. Information given is based on data obtained from similar substances.

Eye irritation: Irritating to eyes.

Information given is based on data obtained from similar substances.

Sensitization: Does not cause skin sensitization.

Information given is based on data obtained from similar substances.

Repeated dose toxicity

Species: rat, male, and female

Sex: male and female

Application Route: oral gavage

Dose: 0, 2.5, 25, 250 mg/kg/bw/d
Exposure time: 14 wk
Number of exposures: 7 d/wk
Method: OCED Guideline 408
No adverse effects expected
Information given is based on data obtained from similar substances.

Developmental Toxicity

Species: Rat
Application Route: oral gavage
Dose: 100, 500, 1000 mg/kg/d
Exposure time: GD 6 -19
Number of exposures: Daily
Test period: 20 d
Method: OECD Guideline 414
NOAEL Teratogenicity: 1.000 mg/kg
NOAEL Maternal: 1.000 mg/kg
No adverse effects expected Information given is based on data obtained from similar substances.

Aspiration toxicity: May be harmful if swallowed and enters airways.

CMR effects

Carcinogenicity: Not available
Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects.
Teratogenicity: Animal testing did not show any effects on fetal development.
Reproductive toxicity: Not available

Further information: Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting. Concentrations substantially above the TLV value may cause narcotic effects. Solvents may degrease the skin.

Section 12. Ecological Information

Toxicity to fish

LC50: > 49.8 mg/l
Exposure time: 96h
Species: Danio rerio (Zebra Fish) semi-static test Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates

EC50: 17 mg/l
Exposure time: 48h
Species: Daphnia magna (Water flea)
static test Information given is based on data obtained from similar substances.

Toxicity to algae

EC50: 38 mg/l

Exposure time: 72h

Species: Pseudokirchneriella subcapitata (green algae)

Method: OECD Test Guideline 201

Information given is based on data obtained from similar substances.

M-Factor: 1

Toxicity to bacteria

EC50: > 1.000 mg/l

Exposure time: 3h

Respiration inhibition

Method: OECD Test Guideline 209

Biodegradability

Aerobic

Result: Not readily biodegradable.

41%

Testing period: 28d

Method: OECD Test Guideline 301D

Information given is based on data obtained from similar substances.

Results of PBT assessment

Diethyl Sulfide: Non-classified PBT substance, Non-classified vPvB substance

Additional ecological information: Harmful to aquatic life with long lasting effects.

Section 13. Disposal Considerations

Waste Treatment Methods: Dispose of product and contaminated packaging in accordance with all local, state, and federal environmental control regulations.

Section 14. Transport Information

US DOT (United States Department of Transportation)

UN2375, Diethyl Sulfide, Class 3, PG II

IMO / IMDG (International Maritime Dangerous Goods)

UN2375, Diethyl Sulfide, Class 3, PG II, (-10 to -4 °C)

IATA (International Air Transport Association)

UN2375, Diethyl Sulfide, Class 3, PG II

ADR (Agreement on Dangerous Goods by Road (Europe))

UN2375, Diethyl Sulfide, Class 3, PG II, (D/E)

RID (Regulations Concerning the International Transport of Dangerous Goods (Europe))

UN2375, Diethyl Sulfide, Class 3, PG II



ADN (European Agreement Concerning the International Carriage of Dangerous Goods by Inland Waterways)

UN2375, Diethyl Sulfide, Class 3, PG II

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Section 15. Regulatory Information

National Legislation

Major Accident Hazard Legislation: 96/82/EC Update: 2003

Highly flammable

7b

Quantity 1: 5.000 t

Quantity 2: 50.000 t

Notification Status

Europe REACH: On the inventory, or in compliance with the inventory

Notification number: 01-2119971585-25-000

United States of America TSCA: On the inventory, or in compliance with the inventory

Canada DSL: On the inventory, or in compliance with the inventory

Australia AICS: On the inventory, or in compliance with the inventory

New Zealand NZIoC: On the inventory, or in compliance with the inventory

Japan ENCS: Not in compliance with the inventory

Korea KECl: On the inventory, or in compliance with the inventory

Philippines PICCS: On the inventory, or in compliance with the inventory

China IECS: On the inventory, or in compliance with the inventory

Section 16. Other Information

Disclaimer: The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product.

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