

## Material Safety Data Sheet

Version 3.1

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1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Diethyl fumarate

Product Number : D95654

Brand : Aldrich

Supplier : Sigma-Aldrich  
3050 Spruce Street  
SAINT LOUIS MO 63103  
USA

Telephone : +1 800-325-5832

Fax : +1 800-325-5052

Emergency Phone # (For both supplier and manufacturer) : (314) 776-6555

Preparation Information : Sigma-Aldrich Corporation  
Product Safety - Americas Region  
1-800-521-8956

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2. HAZARDS IDENTIFICATION

## Emergency Overview

## OSHA Hazards

Combustible Liquid, Harmful by ingestion.

## GHS Classification

Flammable liquids (Category 4)

Acute toxicity, Oral (Category 4)

Acute aquatic toxicity (Category 2)

## GHS Label elements, including precautionary statements

Pictogram



Signal word

Warning

Hazard statement(s)

H227

Combustible liquid

H302

Harmful if swallowed.

H401

Toxic to aquatic life.

Precautionary statement(s)

none

## HMIS Classification

Health hazard: 1

Flammability: 2

Physical hazards: 0

## NFPA Rating

Health hazard: 1

Fire: 2

Reactivity Hazard: 0

## Potential Health Effects

## Inhalation

May be harmful if inhaled. May cause respiratory tract irritation.

**Skin**  
**Eyes**  
**Ingestion**

Harmful if absorbed through skin. May cause skin irritation.  
May cause eye irritation.  
Harmful if swallowed.

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### 3. COMPOSITION/INFORMATION ON INGREDIENTS

Formula :  $C_8H_{12}O_4$   
Molecular Weight : 172.18 g/mol

| Component               |           | Concentration |
|-------------------------|-----------|---------------|
| <b>Diethyl fumarate</b> |           |               |
| CAS-No.                 | 623-91-6  | -             |
| EC-No.                  | 210-819-7 |               |

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### 4. FIRST AID MEASURES

#### General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

#### If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

#### In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

#### In case of eye contact

Flush eyes with water as a precaution.

#### If swallowed

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

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### 5. FIREFIGHTING MEASURES

#### Suitable extinguishing media

For small (incipient) fires, use media such as "alcohol" foam, dry chemical, or carbon dioxide. For large fires, apply water from as far as possible. Use very large quantities (flooding) of water applied as a mist or spray; solid streams of water may be ineffective. Cool all affected containers with flooding quantities of water.

#### Special protective equipment for firefighters

Wear self contained breathing apparatus for fire fighting if necessary.

#### Hazardous combustion products

Hazardous decomposition products formed under fire conditions. - Carbon oxides

#### Further information

Use water spray to cool unopened containers.

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### 6. ACCIDENTAL RELEASE MEASURES

#### Personal precautions

Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

#### Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

#### Methods and materials for containment and cleaning up

Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Keep in suitable, closed containers for disposal.

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### 7. HANDLING AND STORAGE

**Precautions for safe handling**

Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.

Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

**Conditions for safe storage**

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.

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**8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

Contains no substances with occupational exposure limit values.

**Personal protective equipment****Respiratory protection**

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

**Hand protection**

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

**Eye protection**

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

**Skin and body protection**

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

**Hygiene measures**

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

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**9. PHYSICAL AND CHEMICAL PROPERTIES****Appearance**

Form clear, liquid

Colour light yellow

**Safety data**

pH no data available

Melting point/freezing point Melting point/range: 1 - 2 °C (34 - 36 °F) - lit.

Boiling point 218 - 219 °C (424 - 426 °F) - lit.

Flash point 92 °C (198 °F) - closed cup

Ignition temperature no data available

Autoignition temperature no data available

Lower explosion limit no data available

Upper explosion limit no data available

Vapour pressure no data available

Density 1.052 g/mL at 25 °C (77 °F)

Water solubility no data available

Partition coefficient: no data available

|                         |                   |
|-------------------------|-------------------|
| n-octanol/water         |                   |
| Relative vapour density | no data available |
| Odour                   | no data available |
| Odour Threshold         | no data available |
| Evaporation rate        | no data available |

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## 10. STABILITY AND REACTIVITY

### Chemical stability

Stable under recommended storage conditions.

### Possibility of hazardous reactions

no data available

### Conditions to avoid

Heat, flames and sparks.

### Materials to avoid

acids, Bases, Oxidizing agents, Reducing agents

### Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides

Other decomposition products - no data available

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## 11. TOXICOLOGICAL INFORMATION

### Acute toxicity

#### Oral LD50

LD50 Oral - rat - 1,780 mg/kg

#### Inhalation LC50

no data available

#### Dermal LD50

no data available

#### Other information on acute toxicity

no data available

### Skin corrosion/irritation

no data available

### Serious eye damage/eye irritation

no data available

### Respiratory or skin sensitization

no data available

### Germ cell mutagenicity

no data available

### Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

## Reproductive toxicity

no data available

## Teratogenicity

no data available

## Specific target organ toxicity - single exposure (Globally Harmonized System)

no data available

## Specific target organ toxicity - repeated exposure (Globally Harmonized System)

no data available

## Aspiration hazard

no data available

## Potential health effects

|                   |                                                                    |
|-------------------|--------------------------------------------------------------------|
| <b>Inhalation</b> | May be harmful if inhaled. May cause respiratory tract irritation. |
| <b>Ingestion</b>  | Harmful if swallowed.                                              |
| <b>Skin</b>       | Harmful if absorbed through skin. May cause skin irritation.       |
| <b>Eyes</b>       | May cause eye irritation.                                          |

## Signs and Symptoms of Exposure

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

## Synergistic effects

no data available

## Additional Information

RTECS: EM5950000

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## 12. ECOLOGICAL INFORMATION

### Toxicity

Toxicity to fish                      LC50 - Pimephales promelas (fathead minnow) - 4.5 mg/l - 96 h

### Persistence and degradability

no data available

### Bioaccumulative potential

no data available

### Mobility in soil

no data available

### PBT and vPvB assessment

no data available

### Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Toxic to aquatic life.

no data available

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## 13. DISPOSAL CONSIDERATIONS

### Product

This combustible material may be burned in a chemical incinerator equipped with an afterburner and scrubber. Offer surplus and non-recyclable solutions to a licensed disposal company.

### Contaminated packaging

Dispose of as unused product.

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## 14. TRANSPORT INFORMATION

**DOT (US)**

NA-Number: 1993 Class: CBL Packing group: III  
Proper shipping name: Combustible liquid, n.o.s. (Diethyl fumarate)  
Marine pollutant: No  
Poison Inhalation Hazard: No

**IMDG**

Not dangerous goods

**IATA**

Not dangerous goods

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**15. REGULATORY INFORMATION****OSHA Hazards**

Combustible Liquid, Harmful by ingestion.

**SARA 302 Components**

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

**SARA 313 Components**

SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

**SARA 311/312 Hazards**

Fire Hazard, Acute Health Hazard

**Massachusetts Right To Know Components**

No components are subject to the Massachusetts Right to Know Act.

**Pennsylvania Right To Know Components**

|                  | CAS-No.  | Revision Date |
|------------------|----------|---------------|
| Diethyl fumarate | 623-91-6 |               |

**New Jersey Right To Know Components**

|                  | CAS-No.  | Revision Date |
|------------------|----------|---------------|
| Diethyl fumarate | 623-91-6 |               |

**California Prop. 65 Components**

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

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**16. OTHER INFORMATION****Further information**

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