1. PRODUCT AND COMPANY IDENTIFICATION

Product name: Diethyl ether
Product Number: 296082
Brand: Sigma-Aldrich
Company: Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO  63103
USA
Telephone: +18003255832
Fax: +18003255052
Emergency Phone #: (314) 776-6555

2. HAZARDS IDENTIFICATION

Emergency Overview

OSHA Hazards
Flammable liquid, Target Organ Effect, Harmful by ingestion., Irritant

Target Organs
Central nervous system, Kidney, Liver, Gastrointestinal tract, Skeletal muscle.

Other hazards which do not result in classification
May form explosive peroxides.

GHS Label elements, including precautionary statements

Pictogram

Signal word: Danger

Hazard statement(s)
H224 Extremely flammable liquid and vapour.
H302 Harmful if swallowed.
H319 Causes serious eye irritation.
H333 May be harmful if inhaled.
H336 May cause drowsiness or dizziness.

Precautionary statement(s)
P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

HMIS Classification
Health hazard: 2
Chronic Health Hazard: *
Flammability: 4
Physical hazards: 2

NFPA Rating
Health hazard: 2
Fire: 4
Reactivity Hazard: 0
Potential Health Effects

**Inhalation**
May be harmful if inhaled. Causes respiratory tract irritation. Vapours may cause drowsiness and dizziness.

**Skin**
Harmful if absorbed through skin. Causes skin irritation. Repeated exposure may cause skin dryness or cracking.

**Eyes**
Causes eye irritation.

**Ingestion**
Harmful if swallowed.

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

**Synonyms**: Ether  
**Formula**: C4H10O  
**CAS-No.**  
**EC-No.**  
**Index-No.**  
**Concentration**

<table>
<thead>
<tr>
<th>Chemical</th>
<th>CAS-No.</th>
<th>EC-No.</th>
<th>Index-No.</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIETHYL ETHER</td>
<td>60-29-7</td>
<td>200-467-2</td>
<td>603-022-00-4</td>
<td>&gt;= 99.7 %</td>
</tr>
<tr>
<td>2,6-di-tert-Butyl-p-cresol</td>
<td>128-37-0</td>
<td>204-881-4</td>
<td>-</td>
<td>1 ppm</td>
</tr>
</tbody>
</table>

### 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**
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

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

### 5. FIRE-FIGHTING 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 fire-fighters**
Wear self contained breathing apparatus for fire fighting if necessary.

**Further information**
Use water spray to cool unopened containers.

### 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions**
Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. 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.
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).

7. HANDLING AND STORAGE

Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Use explosion-proof equipment. 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. Store in cool place.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Update</th>
<th>Basis</th>
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<tbody>
<tr>
<td>DIETHYL ETHER</td>
<td>60-29-7</td>
<td>TWA 400 ppm</td>
<td></td>
<td>2007-01-01</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>STEL 500 ppm</td>
<td></td>
<td>2007-01-01</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA 400 ppm</td>
<td></td>
<td>1989-01-19</td>
<td>USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000</td>
</tr>
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<td></td>
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<td></td>
<td></td>
<td>TWA 400 ppm</td>
<td></td>
<td>1997-08-04</td>
<td>USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants</td>
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</tbody>
</table>

Remarks
Central Nervous System impairment Upper Respiratory Tract irritation

The value in mg/m³ is approximate.

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 AXBEK (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, Flame retardant antistatic protective clothing, 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
9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance
Form liquid
Colour colourless

Safety data
pH no data available
Melting point -116 °C (-177 °F)
Boiling point 34.6 °C (94.3 °F) at 1,013 hPa (760 mmHg)
Flash point -40 °C (-40 °F) - closed cup - DIN 51755 Part 1
Ignition temperature 180 °C (356 °F)
Lower explosion limit 1.8 %(V)
Upper explosion limit 48 %(V)
Vapour pressure 189 hPa (142 mmHg) at 0 °C (32 °F)
389 hPa (292 mmHg) at 10 °C (50 °F)
563 hPa (422 mmHg) at 20 °C (68 °F)
863 hPa (647 mmHg) at 30 °C (86 °F)
1,228 hPa (921 mmHg) at 40 °C (104 °F)
2,311 hPa (1,733 mmHg) at 60 °C (140 °F)
Density 0.71 g/cm³ at 20 °C (68 °F)
Water solubility 65 g/l at 20 °C (68 °F)
Relative vapour density 2.56

10. STABILITY AND REACTIVITY

Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions
Vapours may form explosive mixture with air.

Conditions to avoid
Heat, flames and sparks. Extremes of temperature and direct sunlight.

Materials to avoid
Oxidizing agents, Strong acids

Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides

Contains the following stabiliser(s):
BHT (1 ppm)

11. TOXICOLOGICAL INFORMATION

Acute toxicity
LD50 Oral - rat - 1,215 mg/kg
LC50 Inhalation - mouse - 30 min - 31000 ppm
Remarks: Behavioral: Convulsions or effect on seizure threshold.
LD50 Dermal - rabbit - > 14.2 g/kg

Skin corrosion/irritation
Serious eye damage/eye irritation
Eyes - rabbit - Eye irritation - 24 h - Draize Test

Respiratory or skin sensitization
no data available

**Germ cell mutagenicity**
Genotoxicity in vitro - mouse - Embryo
DNA inhibition
Genotoxicity in vitro - Hamster - fibroblast
Other mutation test systems

**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

**Specific target organ toxicity - single exposure (Globally Harmonized System)**
May cause drowsiness or dizziness.

**Specific target organ toxicity - repeated exposure (Globally Harmonized System)**
no data available

**Aspiration hazard**
no data available

**Potential health effects**

- **Inhalation**
  May be harmful if inhaled. Causes respiratory tract irritation. Vapours may cause drowsiness and dizziness.

- **Ingestion**
  Harmful if swallowed.

- **Skin**
  Harmful if absorbed through skin. Causes skin irritation. Repeated exposure may cause skin dryness or cracking.

- **Eyes**
  Causes eye irritation.

**Signs and Symptoms of Exposure**
Cough, chest pain, Difficulty in breathing, Dizziness, Drowsiness, Contact with eyes can cause; Redness, Provokes tears., Blurred vision, Prolonged or repeated exposure to skin causes defatting and dermatitis., To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

**Additional Information**
RTECS: KI5775000

**12. ECOLOGICAL INFORMATION**

**Toxicity**
Toxicity to fish
LC50 - Pimephales promelas (fathead minnow) - 2,560 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**
13. DISPOSAL CONSIDERATIONS

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN-Number: 1155  Class: 3  Packing group: I
Proper shipping name: Diethyl ether
Reportable Quantity (RQ): 100 lbs
Marine pollutant: No
Poison Inhalation Hazard: No

IMDG
UN-Number: 1155  Class: 3  Packing group: I  EMS-No: F-E, S-D
Proper shipping name: DIETHYL ETHER
Marine pollutant: No

IATA
UN-Number: 1155  Class: 3  Packing group: I
Proper shipping name: Diethyl ether

15. REGULATORY INFORMATION

OSHA Hazards
Flammable liquid, Target Organ Effect, Harmful by ingestion., Irritant

DSL Status
All components of this product are on the Canadian DSL list.

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, Chronic Health Hazard

Massachusetts Right To Know Components

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Pennsylvania Right To Know Components

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New Jersey Right To Know Components

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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.

16. OTHER INFORMATION

Further information
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. Sigma-Aldrich Co., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.