Material Safety Data Sheet

Section 1 - Product and Company Information

Product Name: Ether, anhydrous, 99.7+%  
Product Number: 256082  
Brand: Aldrich Chemical  
Company: Sigma-Aldrich  
Street Address: 3050 Spruce Street  
City, State, Zip, Country: SAINT LOUIS, MO 63103 US  
Technical Phone: 314 771 5765  
Emergency Phone: 414 273 3850 Ext. 5996  
Fax: 606 325 5052

Section 2 - Composition/Information on Ingredient

Substance Name: DIETHYL ETHER STABILIZED WITH BHT  
CAS #: 60-29-7  
SARA 313: No  
Ingredient Name: BUTYLATED HYDROXYTOLUENE  
CAS #: 120-17-0  
Percent: SARA 313

Section 3 - Hazards Identification

Emergency Overview: Extremely flammable (USA); Toxic (USA) Harmful (EU).  
Extremely flammable. May form explosive peroxides. Hazards from inhalation, ingestion, or skin contact.  
Target organ(s): Central nervous system; kidney.

UNIS Rating:  
Health: 2  
Flammability: 4  
Reactivity: 3

NFPA Rating:  
Health: 2  
Flammability: 4  
Reactivity: 3

Section 4 - First Aid Measures

Oral Exposure: If swallowed, wash out mouth with water provided person is conscious. Call a physician.

Section 5 - Fire Fighting Measures

Flammable Hazards: Yes  
Peroxide Former: Yes

Explosion Hazards:  
Vapor may travel considerable distance to source of ignition and flash back.  
Container explosion may occur under fire conditions.  
Flash Point: -40 °F  
Explosion Limits: Lower: 1.8%  
Upper: 46%  
Autoignition Temp: 160 °C  
Flammability: Yes

Extinguishing Media:  
Suitable: Carbon dioxide, dry chemical powder, or appropriate foam. Water may be ineffective.

Firefighting:  
Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Section 6 - Accidental Release Measures

Procedure to be Followed in Case of Leak or Spill:  
Evacuate area. Shut off all sources of ignition. Use nonsparking tools.

Procedure(s) of Personal Protection(s):  
Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

Methods for Cleaning Up:  
Cover with dry ice, sand, or soda ash. Place in covered containers using non-sparking tools and transport outdoors. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

Handling:  
User Exposure:  
Do not breathe vapor. Do not get in eyes, on skin, or clothing. Avoid prolonged or repeated exposure.

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Storage
Suitable
Keep tightly closed. Keep away from heat, sparks, and open flame.

Special Requirements

Section 8 - Exposure Controls / PPE

Engineering Controls
Safety shower and eye bath. Use nonsparking tools. Mechanical exhaust required.

Personal Protective Equipment
Respiratory
Government approved respirator.
Hand
Compatable chemical-resistant gloves.
Eye
Chemical safety goggles.

General Hygiene Measures
Remove and wash contaminated clothing promptly. Wash thoroughly after handling.

Exposure Limits

<table>
<thead>
<tr>
<th>Country</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poland</td>
<td>NDS</td>
<td>300 MG/M3</td>
</tr>
<tr>
<td>Poland</td>
<td>NDSP</td>
<td>1500 MG/M3</td>
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</table>

Exposure Limits, RTECS

<table>
<thead>
<tr>
<th>Country</th>
<th>Source</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>ACGIH</td>
<td>STEL</td>
<td>500 PPM</td>
</tr>
<tr>
<td>USA</td>
<td>ACGIH</td>
<td>TWA</td>
<td>400 PPM</td>
</tr>
<tr>
<td>USA</td>
<td>MSHA Standard-air</td>
<td>TWA</td>
<td>400 PPM (1200 MG/M3)</td>
</tr>
<tr>
<td>USA</td>
<td>OSHA</td>
<td>PEL</td>
<td>8H TWA 400 PPM (1200 MG/M3)</td>
</tr>
</tbody>
</table>

New Zealand
OEL

Remarks: check ACGIH TLV

Section 9 - Physical/Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Liquid</td>
</tr>
<tr>
<td>Physical State</td>
<td>Color</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>74.12 AMU</td>
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<tr>
<td>Property</td>
<td>At Temperature or Pressure</td>
</tr>
<tr>
<td>pH</td>
<td>N/A</td>
</tr>
<tr>
<td>BP/IP Range</td>
<td>34.6 °C</td>
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<tr>
<td>MP/IP Range</td>
<td>-118 °C</td>
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<tr>
<td>Freezing Point</td>
<td>N/A</td>
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<tr>
<td>Vapor Pressure</td>
<td>442.552 mmHg</td>
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<tr>
<td>Vapor Density</td>
<td>2.6 g/l</td>
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<tr>
<td>Saturated Vapor Conc.</td>
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<tr>
<td>SG/Density</td>
<td>0.71 g/cm3</td>
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<tr>
<td>Bulk Density</td>
<td>N/A</td>
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<tr>
<td>Odor Threshold</td>
<td>N/A</td>
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<tr>
<td>Volatility</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Section 10 - Stability and Reactivity

Stability
Stable

Conditions of Instability
May form peroxides of unknown stability.

Conditions to Avoid
Sensitive to light. Sensitive to air. Sensitive to heat.

Materials to Avoid
Oxidizing agents, Strong acids.

Hazardous Decomposition Products
Carbon monoxide, Carbon dioxide.

Hazardous Polymerization
Will not occur.

Section 11 - Toxicological Information

Route of Exposure
Skin Contact
Causes skin irritation.

Skin Absorption
May be harmful if absorbed through the skin.

Eye Contact
Causes eye irritation.

Inhalation
May be harmful if inhaled. Material is irritating to mucous membranes and upper respiratory tract.

Ingestion
Harmful if swallowed.

Target Organ(s) or System(s)

Signs and Symptoms of Exposure
Contact with eyes can cause redness, tearing, and blurred vision. Prolonged or repeated contact with skin can cause dermatitis. Exposure can cause: Coughing, chest pains, difficulty in breathing. Dizziness. Drowsiness. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

RTECS Number: K15775000

Toxicity Data

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VOC Content | N/A
Water Content | N/A
Solvent Content | N/A
Evaporation Rate | N/A
Viscosity | N/A
Partition Coefficient | N/A
Decomposition Temp. | N/A
Flash Point "F" | -40
Flash Point "C" | -40
Explosion Limits | Lower: 1.8 % 18 %
                    Upper: 48 % 38 %
Flammability | N/A
Autoignition Temp | 160 °C
Refractive Index | 1.363
Solubility | N/A

N/A = not available
Section 15 - Regulatory Information

EU Directives Classification
Symbol of Danger: F+ Xn
Indication of Danger
Extremely flammable. Harmful.
Risk Statements
R: 12 19 22 66 67
Extremely flammable. May form explosive peroxides. Harmful if swallowed. Repeated exposure may cause skin dryness or cracking. Vapors may cause drowsiness and dizziness.
Safety Statements
S: 9 16 29 33
Keep container in a well-ventilated place. Keep away from sources of ignition - no smoking. Do not empty into drains. Take precautionary measures against static discharges.

US Classification and Label Text
Indication of Danger
Flammable (USA) Extremely flammable (EU). Toxic (USA) Harmful (EU).
Risk Statements
Extremely flammable. May form explosive peroxides. Harmful if swallowed. Irritating to eyes, respiratory system and skin. Repeated exposure may cause skin dryness or cracking. Vapors may cause drowsiness and dizziness.
Safety Statements
Keep container in a well-ventilated place. Keep away from sources of ignition - no smoking. Do not empty into drains. Take precautionary measures against static discharges.
US Statements
Target organ(s): Central nervous system, kidneys.

United States Regulatory Information
SARA Listed: No

TSCA Inventory Item: Yes

Canada Regulatory Information
WHMIS Classification
This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.
DSL: Yes
NDSL: No

Section 16 - Other Information

Disclaimer
For R&D use only. Not for drug, household or other uses.

Warranty
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. Sigma-Aldrich Inc., 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. Copyright 2004 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.