Material Safety Data Sheet

Effective Date: 04/06/89
Supersedes: 02/15/89

Product Identification: ETHYL ETHER

Synonyms: Anesthesia ether; ethyl oxide; diethyl ether
Chemical Formula: C₂H₅OC₂H₅
Formula CAS No.: 60-29-7
Molecular Weight: 74.12

Hazardous Ingredients: Ethyl ether
CAS 64-17-5 Ethyl Alcohol

Precautionary Measures

DANGER EXTREMELY FLAMMABLE. HARMFUL IF SWALLOWED OR INHALED.
CAUSES ANESTHETIC EFFECTS.
May form explosive peroxides.
Keep away from heat, sparks and flame.
Keep container closed.
Use with adequate ventilation.
Avoid breathing vapor.
Wash thoroughly after handling. DO NOT OPEN Unless Contents Are At Room
Temperature (72°F) or Below.

Emergency/First Aid

If swallowed, induce vomiting immediately by giving two glasses of water and sticking
finger down throat. Never give anything by mouth to an unconscious person. If inhaled,
remove to fresh air. If not breathing, give artificial respiration. If breathing is
difficult, give oxygen. In all cases call a physician.

See Section 5.

DOT Hazard Class: Flammable Liquid

Physical Data

SECTION 1

Appearance: Colorless liquid.
Odor: Sweet, sweet odor.
Solubility: 7.5 g/100 g water @ 20°C.
Boiling Point: 35°C (95°F)
Melting Point: -123°C (-190°F)
Specific Gravity (water = 1): 0.71
Vapor Density (Air=1): 2.6
Vapor Pressure (mm Hg): 422 @ 20°C (68°F)
Evaporation Rate: (Boiling=1): 37.5
**Health Hazard Information**

**A. Exposure/Health Effects**

**Inhalation:**

Irritant. General anesthesia by inhalation can occur. Continued exposure may lead to respiratory failure or death. Early symptoms include irritation of nose and throat, vomiting, and irregular respiration, followed by dizziness, drowsiness, and unconsciousness.

**Ingestion:**

Irritating to the mucous membranes. Ingestion of 1 or 2 ounces may be fatal. Because of volatility the stomach becomes distended, which may cause belching. Other symptoms include vomiting, unconsciousness, and coma.

**Skin contact:**

Irritating to the skin and mucous membranes by drying effect. Can cause dermatitis on prolonged exposure.

**Eye contact:**

May cause irritation, redness and pain. Prolonged exposures to high concentrations of vapor can cause eye damage.

**Chronic Exposure:**

Repetitive exposures may be habit forming. Prolonged exposure may result in headaches, drowsiness, excitement, and psychic disturbances.

**Aggravation of pre-existing conditions:**

Persons with pre-existing skin disorders or eye problems or impaired liver, kidney or respiratory function may be more susceptible to the effects of this substance. Alcoholic beverage consumption can enhance the toxic effects of this substance.

**B. FIRST AID**

**Inhalation:**

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

**Ingestion:**

If swallowed, induce vomiting immediately by giving two glasses of water and ticking finger down throat. Never give anything by mouth to an unconscious person. Call physician immediately.

**Skin contact:**

Remove any contaminated clothing, Wash skin with plenty of water for at least 15 minutes. If irritation develops, get medical attention.

**Eye contact:**

Washe eyes with plenty of water for at least 15 minutes. Call a physician.

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**Ethyl Ether**

**Fire and Explosion Information**

**FIRE:**

Dangerous highly flammable liquid.

Flash point: -65°C (-99°F) (closed cup).

Auto ignition temperature: 160°C (320°F).

Flammable limits in air, % by volume:

lel = 1.9; uel = 36.0.

**Explosion:**

Above flash point, vapor-air mixtures are explosive within flammable limits noted above. May form explosive peroxides on long standing or after exposure to air or light.

**Fire Extinguishing Media:**

Dry chemical, foam or carbon dioxide. Treat as a flammable gas in a fire situation. Water spray may be used to keep fire exposed containers cool.

**Special Information:**

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. This highly flammable liquid must be kept from sparks, open flames, hot surfaces, and all sources of heat and ignition. Vapors can flow along surfaces to distant ignition source and flash back.

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**Reactivity Data**

**Stability:**

Stable under ordinary conditions of use and storage. Heat, light, and long standing contribute to instability. Reacts with air to form explosive peroxides.

**Hazardous Decomposition Products:**

Toxic gases and vapors such as carbon monoxide may be released in a fire.

**Hazardous Polymerization:**

Will not occur.

**Incompatibilities:**

Can react dangerously with acetyl peroxide, liquid air, bromine, chlorine, and strong oxidizers such as nitrates.

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**Leak/Spill Disposal Information**

**Remove all sources of ignition; ventilate area of leak or spill; wear full protective equipment and clothing and NIOSH approved self-contained breathing apparatus, full facepiece operated in the pressure demand or other positive pressure mode. Contain and recover liquid when possible. Absorb with vermiculite, dry sand, earth, or similar material. Scoop up non-sparking tools and place in a closed container, and dispose in a RCRA approved facility. Alternatively, spills may be collected as RCRA hazardous waste and dissolved in an alcohol of greater molecular weight than butyl alcohol, then atomized in a suitable combustion chamber. This substance should not be flushed to sewer because of the possibility of an explosion.**

Ensure compliance with local, state and federal regulations.

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**Ethyl Ether**

**SECTION 2**

**Health Hazard Information**

**Exposure/Health Effects**

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**SECTION 3**

**First Aid**

**Inhalation:**

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

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**Skin contact:**

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**Eye contact:**

Wash eyes with plenty of water for at least 15 minutes. Call a physician.

**SECTION 4**

**Toxicity Data**

**RTECS, 1982**

**Oral rat L50:** 2115 mg/kg

**Inhalation rat LC50:** 7800 ppm/150 min

**Mutagenicity tests cited:**

**Irritation eye rabbit:** 100 mg moderate

**skin rabbit:** 360 mg open mild

**SECTION 5**

**Health Hazard Information**

**Exposure/Health Effects**

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OCCUPATIONAL CONTROL MEASURES

SECTION 6

Airborne Exposure Limits:
- OSHA Permissible Exposure Limit (PEL): 400 ppm (TWA) 500 ppm (STEL)
- ACGIH Threshold Limit Value (TLV): 400 ppm (TWA) 500 ppm (STEL)

Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, "Indoor Ventilation: A Manual of Recommended Practice", most recent edition, for details.

Personal Respirators: (N95 or N99 approved)
If the TLV is exceeded, a full facepiece chemical cartridge respirator may be worn up to the maximum use concentration specified by the respirator supplier. Alternatively, a supplied air full facepiece respirator or airline hood may be worn.

Skin Protection:
Wear protective gloves and clean body-covering clothing.

Eye Protection:
Use chemical safety goggles. Contact lenses should not be worn when working with this material. Maintain eye wash fountain and quick-drench facilities in work area.

STORAGE AND SPECIAL INFORMATION

SECTION 7

Protect against physical damage. Outside or detached storage is preferred. Inside storage should be in a stand-off, flammable liquids storage room or cabinet. Separate from oxidizing materials. Storage and use areas should be No Smoking areas. Isolate from other combustible material. Protect from direct sunlight. Protect against static electricity and lightning for large quantity storage rooms. Protect with automatic sprinkler systems and total flooding carbon dioxide systems. The reactivity hazard may be increased on long-standing due to peroxide formation. DANGER: DO NOT OPEN unless contents are at room temperature (72°F) or below. Allow at least 24 hours for material to cool to room temperature before opening container.

ADDITIONAL INFORMATION

Addendum to Material Safety Data Sheet

REGULATORY STATUS

<table>
<thead>
<tr>
<th>Hazard Categories for SARA Section 311/312 Reporting</th>
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<tbody>
<tr>
<td>Acute</td>
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<td>-------</td>
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<tr>
<td>X</td>
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<tr>
<th>Products or Components of Product:</th>
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<tbody>
<tr>
<td>ETHYL ETHER</td>
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<tr>
<td>Ethyl alcohol (64-17-5) 0.05%</td>
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<tr>
<th>SARA Section 302 EHS HQ:</th>
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<tr>
<td>Reportable Quantity of Extremely Hazardous Substance, listed at 40 CFR 355.</td>
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<tr>
<th>SARA Section 302 EHS TPO:</th>
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<tbody>
<tr>
<td>Threshold Planning Quantity of Extremely Hazardous Substance. An asterisk (*) following a Threshold Planning Quantity signifies that the material is a solid and has a particle size equal to or larger than 100 micrometers. The Threshold Planning Quantity = 10,000 LBS.</td>
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<tr>
<th>SARA Section 313 Chemicals:</th>
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<tr>
<td>Toxic Substances subject to annual release reporting requirements listed at 40 CFR 372.65.</td>
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<th>CERCLA Sec 103:</th>
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<tr>
<td>Comprehensive Environmental Response, Compensation and Liability Act (Superfund).</td>
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<th>BCP/M:</th>
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<tbody>
<tr>
<td>Resource Conservation and Recovery Act. Commercial chemical product wastes designed as acute hazards and toxic under 40 CFR 261.33</td>
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While Columbus Chemical Industries, Inc. believes that the data contained herein is reliable, they are not to be viewed as a warranty or representation for which Columbus Chemical Industries, Inc. assumes legal responsibility. They are offered solely for your consideration. Investigation by use of these data is required before they can be safely used. This information must be consistent with the applicable Federal, State, and Local laws and regulations.