2-(2-ETHOXYETHOXY)ETHANOL

1. Product Identification

Synonyms: Carbitol®; Diethylene Glycol Ethyl Ether
CAS No.: 111-90-0
Molecular Weight: 134.18
Chemical Formula: C2H5OCH2CH2OCH2CH2OH
Product Codes: 635R, L216

2. Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No</th>
<th>Percent</th>
<th>Hazardous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diethylene Glycol Monoethylether</td>
<td>111-90-0</td>
<td>90 - 100%</td>
<td>Yes</td>
</tr>
<tr>
<td>Ethylene Glycol</td>
<td>107-21-1</td>
<td>0 - 1%</td>
<td>Yes</td>
</tr>
</tbody>
</table>

3. Hazards Identification

Emergency Overview

WARNING! COMBUSTIBLE LIQUID AND VAPOR. CAUSES IRRITATION TO EYES AND SKIN. MAY BE HARMFUL IF SWALLOWED OR INHALED. AFFECTS KIDNEYS.

SAF-T-DATA™ Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate (Life)
Flammability Rating: 2 - Moderate
Reactivity Rating: 1 - Slight
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES; CLASS B EXTINGUISHER
Storage Color Code: Red (flammable)
Potential Health Effects

- Inhalation:
  Low vapor pressure indicates a low inhalation hazard unless this material is heated or misted. Inhalation of high concentrations of vapor or mist may cause kidney damage.

- Ingestion:
  Ingestion may cause kidney damage, nervous system and respiratory depression.

- Skin Contact:
  May cause mild irritation.

- Eye Contact:
  Mild irritant. May cause reddening and slight pain.

- Chronic Exposure:
  No information found.

- Aggravation of Pre-existing Conditions:
  No information found.

4. First Aid Measures

- Inhalation:
  Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

- Ingestion:
  Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.

- Skin Contact:
  Immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

- Eye Contact:
  Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

- Fire:
  Flash point: 83C (181F) CC
  Autoignition temperature: 204C (399F)
  Flammable limits in air % by volume:
    LEL: 1.2; UEL: 23.5
  Combustible Liquid and Vapor! Contact with strong oxidizers may cause fire.

- Explosion:
  Sealed containers may rupture when heated. Above the flash point, explosive vapor-air mixtures may be formed.

- Fire Extinguishing Media:
  Dry chemical, foam or carbon dioxide. Water may be ineffective.

- 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.

6. Accidental Release Measures

  Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain
and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e.g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer!

7. Handling and Storage

Keep in a tightly closed container. Store in a cool, dry, ventilated area away from sources of heat or ignition. Protect against physical damage. Store separately from reactive or combustible materials, and out of direct sunlight. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
Ethylene Glycol [107-21-1]:

-ACGIH Short-Term Exposure Limit (STEL):
100 mg/m3 Ceiling (aerosol only)
Diethylene glycol monoethylene:

AIHA Workplace Environmental Exposure Level (WEL): TWA: 25 ppm.

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, Industrial Ventilation, A Manual of Recommended Practices, most recent edition, for details.

Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded and engineering controls are not feasible, a half-face organic vapor respirator may be worn for up to ten times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece organic vapor respirator may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-face piece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

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

Eye Protection:
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:
Clear, colorless liquid.

Odor:
Faint pleasant odor.

Solubility:
Soluble in water.

Specific Gravity:
0.9855 @ 25°C/4°C

pH:
2-(2-ETHOXYETHOXY)ETHANOL

No information found.
% Volatiles by volume @ 21C (70F):
100
Boiling Point:
196C (385F)
Melting Point:
-76C (-105F)
Vapor Density (Air=1):
4.62
Vapor Pressure (mm Hg):
0.14
Evaporation Rate (BuAc=1):
< 0.01

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage. Forms peroxides of unknown stability.
Hazardous Decomposition Products:
Carbon dioxide and carbon monoxide may form when heated to decomposition.
Hazardous Polymerization:
This substance does not polymerize.
Incompatibilities:
Strong oxidizers, caustics.
Conditions to Avoid:
Heat, flames, ignition sources and incompatibles.

11. Toxicological Information

- Ethylene Glycol -
  Oral rat LD50: 4700 mg/kg; skin rabbit LD50: 9530 mg/kg.
  Irritation - skin rabbit: 555mg(open), mild; eye rabbit: 500mg/24H, mild.
  Investigated as a tumorigen, mutagen, reproductive effector.

  Diethylene glycol monoethyl ether:
  LD50 Oral Rat: 5500 mg/kg Investigated as a mutagen, reproductive effector.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>NTP Carcinogen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diethylene Glycol Monoethyl Ether (111-90-0)</td>
<td>Known</td>
</tr>
<tr>
<td>Ethylene Glycol (107-21-1)</td>
<td>Anticipated</td>
</tr>
<tr>
<td></td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>None</td>
</tr>
</tbody>
</table>

12. Ecological Information

Environmental Fate:
When released into the soil, this material may biodegrade to a moderate extent. When released into the soil, this material is not expected to evaporate significantly. When released into water, this material may biodegrade to a moderate extent. When released into water, this material is not expected to evaporate significantly. This material is not expected to significantly bioaccumulate. When released into the air, this material is expected to be readily degraded by reaction with photochemically produced hydroxyl radicals.
**Environmental Toxicity:**
The LC50/96-hour values for fish are over 100 mg/l.

---

**13. Disposal Considerations**

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

---

**14. Transport Information**

Not regulated.

---

**15. Regulatory Information**

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>TSCA</th>
<th>EC</th>
<th>Japan</th>
<th>Australia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diethylene Glycol Monoethyl ether (111-90-0)</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Ethylene Glycol (107-21-1)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Korea</th>
<th>DSL</th>
<th>NDSL</th>
<th>Phil.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diethylene Glycol Monoethyl ether (111-90-0)</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Ethylene Glycol (107-21-1)</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

---

**Federal, State & International Regulations - Part 1**

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>RQ</th>
<th>TPQ</th>
<th>List</th>
<th>Chemical Catg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diethylene Glycol Monoethyl ether (111-90-0)</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Glycol ether</td>
</tr>
<tr>
<td>Ethylene Glycol (107-21-1)</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CERCLA</th>
<th>261.33</th>
<th>8(d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diethylene Glycol Monoethyl ether (111-90-0)</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Ethylene Glycol (107-21-1)</td>
<td>5000</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: No Fire: Yes Pressure: No
Reactivity: No

Australian Hazchem Code: None allocated.
Poison Schedule: None allocated.
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

**16. Other Information**

NFPA Ratings: Health: 1 Flammability: 1 Reactivity: 0
Label Hazard Warning:
WARNING! COMBUSTIBLE LIQUID AND VAPOR. CAUSES IRRITATION TO EYES AND SKIN. MAY BE HARMFUL IF SWALLOWED OR INHALED. AFFECTS KIDNEYS.

Label Precautions:
Keep away from heat and flame.
Avoid contact with eyes, skin and clothing.
Avoid breathing vapor.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.

Label First Aid:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. In all cases, get medical attention.

Product Use:
Laboratory Reagent.

Revision Information:
MSDS Section(s) changed since last revision of document include: 10.

Disclaimer:
*************************************************************************

Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.

*************************************************************************

Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)