Section 1.1: Identification

Chemical Name/Synonyms: Propylene Oxide

Product or Trade Name: SPI-Chem™ Propylene Oxide

CAS #: 75-56-9

Chemical Formula: CH₃CHCH₂O

Section 1.2: Relevant Uses/Restrictions

Identified use: Scientific research and development.
Intended use: Extender and diluent for epoxy resin formulations.

Section 1.3: Supplier of the Safety Data Sheet

SPI Supplies Division
Structure Probe, Inc.
P.O. Box 656 West Chester, PA 19381-0656 USA
Phone: 1-(610)-436-5400 Fax: 1-(610)-436-5755
spi3spi@2spi.com
http://www.2spi.com
Manufacturer's CAGE: 1P573

Section 1.4: Emergency telephone number

Emergencies
Contacting CHEMTREC:

24 Hour Emergency Use Only #s...
Worldwide phone: 1-(703)-741-5970
Toll-free phone: 1-(800)-424-9300 USA + Canada only

Section 2: Hazard Identification

2.1 Classification of the substance

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
- Flammable liquid (category 1)
- Mutagen (category 1B)
- Carcinogen (category 1B)
- Acute toxicity (category 4) [ingested, skin, inhaled]
- Skin irritant (category 2)
- Eye irritant (category 2)
- Specific Target Organ Toxicity, single exposure (category 3)
2.2 Label elements

Pictogram

Signal Word: Danger

Hazard statements:
- H224 Extremely flammable liquid and vapor
- H302 + H312 + H332 Harmful if swallowed, in contact with skin, or inhaled
- H315 Causes skin irritation
- H319 Causes serious eye irritation
- H335 May cause respiratory irritation
- H340 May cause genetic defects
- H350 May cause cancer

Precautionary statements:
- P210 Keep away from heat/sparks/open flames/hot surfaces – No smoking
- P260 Do not breathe dust/fume/gas/mist/vapors/spray
- P303 + P361 + P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
- P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing
- P405 Store locked up
- P501 Dispose of contents/container in accordance with local/ regional/ national/

2.3 Other Hazards:

Results of PBT and vPvB assessment:
- PBT: not applicable
- vPvB: not applicable

Hazardous Material Information System USA
- Health: 2
- Fire Hazard: 4
- Reactivity: 1
- Personal Protection:

NFPA Rating (estimated)
- Health: 3
- Flammability: 4
- Reactivity: 1

Section 3: Composition

3.1 Substances:

Propylene oxide CAS# 75-56-9 EC# 200-879-2 >99%
Section 4: First Aid Measures

4.1 Description of first aid measures:

Inhalation
Supply fresh air. If required, provide artificial respiration. Keep patient warm.
Seek immediate medical advice.

Skin Contact
Immediately wash with water and soap and rinse thoroughly.
Seek immediate medical advice.

Eye Contact
Rinse opened eye for several minutes under running water.
Then consult a doctor.

Ingestion
Seek medical treatment.

Self-protection of the first aider
No further relevant information available.

4.2 Most important symptoms and effects, both acute and delayed
No further relevant information available

4.3 Indication of any immediate medical attention and special treatment needed
No further relevant information available.

Section 5: Fire Fighting Measures

5.1 Extinguishing media
Suitable extinguishing media: Carbon dioxide, extinguishing powder or water spray. Fight larger fires with water spry or alcohol resistant foam.

5.2 Special hazards arising from the substance or mixture
If this material is involved in a fire, carbon monoxide and carbon dioxide may be released.

Hazardous combustion products: carbon monoxide and carbon dioxide

5.3 Advice for firefighters
Special protective equipment and precautions for firefighters
Wear self-contained respirator.
Wear fully protective impervious suit.

Section 6: Accidental Release Measures

6.1 Personal precautions
Wear protective equipment.
Keep unprotected persons away.
Ensure adequate ventilation.
Keep away from ignition sources.

6.2 Environmental precautions
Do not allow material to be released to the environment without proper governmental permits.
Do not allow product to reach sewage system or any water course.
Do not allow to penetrate the ground / soil.

6.3 Methods and material for containment and cleaning up
Keep away from ignition sources.
Absorb with liquid-binding materials (sand, diatomite, acid binders, universal binders, sawdust).
Dispose of contaminated material as waste according to Section 13.
Endure adequate ventilation.

6.4 Reference to other sections
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

Section 7: Handling and Storage

7.1 Precautions for safe handling
Keep container tightly sealed.
Ensure good ventilation at the workplace.
Open and handle container with care.
Protect against electrostatic charges.
Fumes can combine with air to form an explosive mixture.
Keep ignition sources away.

7.2 Conditions for safe storage, including any incompatibilities
Store in cool, dry place in tightly closed containers.
Keep away from heat and direct sunlight.
Do not store together with acids.
Store away from strong bases, oxidizing agents, and amines.

7.3 Specific end uses
No further relevant information available.

Section 8: Exposure Controls and Personal Protection

8.1 Control parameter and Personal Protection
Workplace exposure limits
CAS# 75-56-9 Propylene oxide (>99%)
OSHA PEL (USA): Long-term value: 240 mg/m³, 100 ppm
ACGIH TWA: 2 ppm
NIOSH IDLH: 400 ppm
EL (Canada): Long-term value: 2 ppm
EV (Canada): Long-term value: 2 ppm
Mexico OEL TWA: 20 ppm, 50 mg/m³

Biological limit values
No further relevant information available.

8.2 Exposure controls
8.2.1 Appropriate engineering controls
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

8.2.2 Individual protection measures
The usual precautionary measures for handling chemicals should be followed.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Store protective clothing separately.
Avoid contact with the eyes and skin.
Maintain an ergonomically appropriate working environment.

**Breathing equipment:** Use suitable respirator when high concentrations are present.

**Recommended filter device for short term use:** Use a respirator with organic vapor/acid gas cartridges as a backup to engineering controls. Risk assessment should be performed to determine if air-purifying respirators are appropriate. Only use equipment tested and approved under appropriate government standards such as NIOSH (USA) or CEN (EU).

**Protection of hands:** Impervious gloves. Check protective gloves prior to each use for their proper condition. The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer. Material of gloves: Butyl rubber.

**Eye protection:** Safety glasses

**Body protection:** Protective work clothing.

### 8.2.3 Environmental exposure controls
No further relevant information available.

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**Section 9: Physical and Chemical Properties**

9.1 Information on basic physical and chemical properties

- **Appearance:** Colorless liquid
- **Odor:** Ether-like
- **Odor threshold:** Not determined
- **pH:** Not determined
- **Melting point/Freezing point:** -112 °C (-170 °F)
- **Boiling point/Boiling point range:** 34-35 °C (93-95 °F)
- **Flash Point:** -35 °C (-37 °F)
- **Evaporation rate:** Not determined
- **Flammability (solid, gas):** Not applicable
- **Upper/lower flammability or explosive limits**
  
  - Lower: 1.9 Vol %
  - Upper: 15 Vol %
- **Vapor Pressure at 20 °C (68 °F):** 590 hPa (443 mm Hg)
- **Vapor density:** Not determined
- **Relative density:** Not determined
- **Solubility in / Miscibility with water:** 405 g/l at 20 °C (68 °F)
- **Partition coefficient (n-octanol/water):** Not determined
- **Ignition temperature:** 430 °C (806 °F)
- **Decomposition temperature:** Not determined
- **Viscosity:** Not determined
- **Explosive properties:** Not explosive. However, formation of explosive air/vapor mixtures possible
- **Oxidizing Properties:** No data available

9.2 Other information: No further relevant information available.
Section 10: Stability and Reactivity

10.1 Reactivity: No information known.

10.2 Chemical Stability: Stable under recommended storage conditions.

10.3 Possibility of Hazardous Reactions: Reacts with strong oxidizing agents.

10.4 Conditions to avoid: Decomposition will not occur if used and stored according to specifications.

10.5 Incompatible materials: Acids, Copper and copper alloys, Oxidizing agents, Bases, Amines.

10.6 Hazardous decomposition products: Carbon monoxide and carbon dioxide.

Section 11: Toxicological Information

Information on the likely routes of exposure
Registry of Toxic Effects of Chemical Substances: RTECS# TZ2975000

LD/LC50 VALUES THAT ARE RELEVANT FOR CLASSIFICATION:

<table>
<thead>
<tr>
<th>Route</th>
<th>LD50</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>rat</td>
<td>380 mg/kg</td>
</tr>
<tr>
<td>Dermal</td>
<td>rabbit</td>
<td>1245 mg/kg</td>
</tr>
<tr>
<td>Inhalation</td>
<td>LC50/4hr</td>
<td>9.7 mg/l/4H</td>
</tr>
</tbody>
</table>

11.1 Information on toxicological effects
a. acute toxicity
   Harmful if inhaled.
   Harmful in contact with skin.
   Harmful if swallowed.
   Danger through skin absorption
   RTECS# TZ2975000 contains acute toxicity data for this substance.

b. skin corrosion/irritation
   Causes skin irritation.

c. serious eye damage/irritation
   Causes serious eye irritation.

d. respiratory or skin sensitization
   No sensitizing effects known.

e. germ cell mutagenicity
   May cause genetic defects.
   RTECS# TZ2975000 contains reproductive data for this substance.

f. carcinogenicity
   May cause cancer.
   EPA-B2: Probable human carcinogen, sufficient evidence from animal studies;
   IARC-2B: Possible carcinogenic to humans: limited evidence in humans in the absence
   of sufficient evidence in experimental animals.
   NTP-R: Reasonably anticipated to be a carcinogen: limited evidence from studies in
   humans or sufficient evidence from studies in experimental animals.
   ACGIH A3: Animal carcinogen: Agent is carcinogenic in experimental animals at a
   relatively high dose, by route(s) of administration at site(s), of histologic type(s),
   or by mechanism(s) not considered relevant to worker exposure. Available
   epidemiologic studies do not confirm an increased risk of cancer in exposed humans.
   Available evidence suggests that the agent is not likely to cause cancer in humans
   except under uncommon or unlikely routes or levels of exposure.
   RTECS# TZ2975000 contains tumorigenic and/or carcinogenic and/or neoplastic data for
   this substance.

g. reproductive toxicity
RTECS# TZ2975000 contains reproductive data for this substance.

h. STOT-single exposure
   May cause respiratory irritation.

i. STOT-repeated exposure
   No effects known.

j. aspiration hazard
   No effects known.

Additional information:

Subacute to chronic toxicity: RTECS# TZ2975000 contains multiple dose toxicity data for this substance.

Additional toxicological information: To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

OSHA-Ca (Occupational Safety & Health Administration): Substance is not listed.

Section 12: Ecological Information

12.1 Toxicity
   Aquatic toxicity: No further relevant information available.

12.2 Persistence and degradability: No further relevant information available.

12.3 Bioaccumulative potential: No further relevant information available.

12.4 Mobility in soil: No further relevant information available.
   Additional ecological information:
   General notes:
   Do not allow material to be released to the environment without proper governmental permits.
   Do not allow product to reach ground water, water course, or sewage system, even in small quantities.
   Danger to drinking water if even extremely small quantities leak into the ground.
   Avoid transfer into the environment.

12.5 Results of PBT and vPvB assessment:
   PBT: Not applicable
   vPvB: Not applicable

12.6 Other adverse effects: No further relevant information available.

Section 13: Disposal Considerations

13.1 Waste treatment methods
   Recommendation: Consult state, local and national regulations to ensure proper disposal.
   Uncleaned packagings: Disposal must be made according to official regulations.

Section 14: Transport Information

14.1 UN number: DOT
   UN1280
   IATA
   UN1280

14.2 UN proper shipping name: propylene oxide
   PROPYLENE OXIDE

14.3 Transport hazard class: 3 Flammable liquids

14.4 Packing Group I
14.5 Environmental hazards  Not applicable  Not applicable
14.6 Special precautions for user  Warning: Flammable liquids.

Section 15: Regulatory Information

15.1 Safety, health and environmental regulations/ legislation specific for the substance or mixture

TSCA: All components of this product are listed in the US EPA TSCA Chemicals Substance Inventory.

SARA Section 313: CAS# 75-56-9 Propylene oxide is listed.

OSHA specifically regulated substances
OSHA-Ca (Occupational Safety & Health Administration): Substance is not listed.

California Proposition 65
Prop 65 – Chemicals known to cause cancer: CASE 75-56-9 Propylene oxide is listed.
Prop 65 – Developmental toxicity – Substance is not listed.
Prop 65 – Developmental toxicity, female – Substance is not listed.
Prop 65 – Developmental toxicity, male – Substance is not listed.

CANADA
DSL: All components of this product are listed on the Canadian Domestic Substances Lis (DSL).

EU regulations
REACH Regulations (EC) No. 1907/2006:
This substance is included in the Candidate List of Substances of Very High Concern (SVHC) according to Regulation (EC) No. 1907/2006 (REACH).

15.2 Chemical Safety Assessment
INFORMATION ABOUT LIMITATIONS OF USE:
Workers are not allowed to be exposed to this hazardous material. Exceptions can be made by the authorities in certain cases. For use only by technically qualified individuals.

Date of Preparation: May 16, 2016

Abbreviations and acronyms
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxicological
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
STEL: Short Term Exposure Limit
Section 16: Other Information

Disclaimer of Liability:

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