SECTION 1: Identification

1.1. Identification

Product name: 5,6-EPOXYHEXYLTRIETHOXYSILANE
Product code: SIE4675.0
Product form: Substance
Physical state: Liquid
Formula: C12H26O4Si
Synonyms: 6-TRIETHOXYSILYLHEXYLOXIRANE
Chemical family: ORGANOEPOXYSILANE

1.2. Recommended use and restrictions on use

Recommended use: Chemical intermediate

1.3. Supplier

GELEST, INC.
11 East Steel Road
Morrisville, PA 19067
USA
T 215-547-1015 - F 215-547-2484 - (M-F): 8:00 AM - 5:30 PM EST
info@gelest.com - www.gelest.com

1.4. Emergency telephone number

Emergency number: CHEMTREC: 1-800-424-9300 (USA); +1 703-527-3887 (International)

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS-US classification
Serious eye damage/eye irritation Category 2A H319 Causes serious eye irritation
Full text of H statements: see section 16

2.2. GHS Label elements, including precautionary statements

GHS US labeling
Hazard pictograms (GHS US):

Signal word (GHS US): Warning
Hazard statements (GHS US): H319 - Causes serious eye irritation

2.3. Hazards not otherwise classified (HNOC)

Other hazards not contributing to the classification: This product reacts with water in the acid contents of the stomach to form ethanol. This product contains ethanol which is classified as a carcinogen by IARC in alcoholic beverages.

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/Information on ingredients

3.1. Substances

Substance type: Mono-constituent
Name: 5,6-EPOXYHEXYLTRIETHOXYSILANE
CAS-No.: 86138-01-4

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
<th>GHS-US classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>5,6-Epoxyhexyltriethoxysilane</td>
<td>(CAS-No.) 86138-01-4</td>
<td>&gt; 97</td>
<td>Eye Irrit. 2A, H319</td>
</tr>
<tr>
<td>Ethanol</td>
<td>(CAS-No.) 64-17-5</td>
<td></td>
<td>Flam. Liq. 2, H225</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Eye Irrit. 2A, H319</td>
</tr>
</tbody>
</table>
## 5,6-EPOXYHEXYLTRIETHOXYSILANE
### Safety Data Sheet

### 3.2. Mixtures
Not applicable

### SECTION 4: First-aid measures

#### 4.1. Description of first aid measures

| First-aid measures general | Remove contaminated clothing and shoes. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). If possible show this sheet; if not available show packaging or label. |
| First-aid measures after inhalation | Remove victim to fresh air and keep at rest in a position comfortable for breathing. If you feel unwell, seek medical advice. |
| First-aid measures after skin contact | Wash with plenty of soap and water. |
| First-aid measures after eye contact | Immediately flush eyes thoroughly with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical advice/attention. |
| First-aid measures after ingestion | Never give anything by mouth to an unconscious person. Get medical advice/attention. |

#### 4.2. Most important symptoms and effects (acute and delayed)

| Symptoms/effects after inhalation | May cause irritation to the respiratory tract. Overexposure may cause: Cough. Headache. Nausea. |
| Symptoms/effects after skin contact | May cause skin irritation. |
| Symptoms/effects after eye contact | Causes serious eye irritation. |
| Symptoms/effects after ingestion | No information available. |

#### 4.3. Immediate medical attention and special treatment, if necessary
No additional information available

### SECTION 5: Fire-fighting measures

#### 5.1. Suitable (and unsuitable) extinguishing media


#### 5.2. Specific hazards arising from the chemical

| Fire hazard | Irritating fumes and organic acid vapors may develop when material is exposed to elevated temperatures or open flame. |
| Reactivity | Can react exothermically with amines. |

#### 5.3. Special protective equipment and precautions for fire-fighters

| Firefighting instructions | Use water spray to cool exposed surfaces. Exercise caution when fighting any chemical fire. |
| Protection during firefighting | Do not enter fire area without proper protective equipment, including respiratory protection. Avoid all eye and skin contact and do not breathe vapor and mist. |

### SECTION 6: Accidental release measures

#### 6.1. Personal precautions, protective equipment and emergency procedures

##### 6.1.1. For non-emergency personnel

| Emergency procedures | Evacuate unnecessary personnel. |

##### 6.1.2. For emergency responders

| Protective equipment | Equip cleanup crew with proper protection. |

#### 6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

#### 6.3. Methods and material for containment and cleaning up

| Methods for cleaning up | Clean up any spills as soon as possible, using an absorbent material to collect it. Sweep or shovel spills into appropriate container for disposal. |

#### 6.4. Reference to other sections

See Heading 8. Exposure controls and personal protection.

### SECTION 7: Handling and storage

#### 7.1. Precautions for safe handling

| Precautions for safe handling | Use only in well ventilated areas. Avoid all eye and skin contact and do not breathe vapor and mist. |
| Hygiene measures | Wash contaminated clothing before reuse. Wash hands thoroughly after handling. |

#### 7.2. Conditions for safe storage, including any incompatibilities

| Storage conditions | Keep container tightly closed. |
| Storage area | Store in a well-ventilated place. Store away from heat. |
SECTION 8: Exposure controls/personal protection

8.1. Control parameters

<table>
<thead>
<tr>
<th>Ethanol (64-17-5)</th>
<th>ACGIH STEL (ppm)</th>
<th>1000 ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSHA</td>
<td>OSHA PEL (TWA) (mg/m³)</td>
<td>1900 mg/m³</td>
</tr>
<tr>
<td>OSHA</td>
<td>OSHA PEL (TWA) (ppm)</td>
<td>1000 ppm</td>
</tr>
<tr>
<td>IDLH</td>
<td>US IDLH (ppm)</td>
<td>3300 ppm (10% LEL)</td>
</tr>
<tr>
<td>NIOSH</td>
<td>NIOSH REL (TWA) (mg/m³)</td>
<td>1900 mg/m³</td>
</tr>
<tr>
<td>NIOSH</td>
<td>NIOSH REL (TWA) (ppm)</td>
<td>1000 ppm</td>
</tr>
</tbody>
</table>

8.2. Appropriate engineering controls

Appropriate engineering controls: Provide local exhaust or general room ventilation.

8.3. Individual protection measures/Personal protective equipment

Personal protective equipment:

Avoid all unnecessary exposure. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

Hand protection:

Neoprene or nitrile rubber gloves

Eye protection:

Chemical goggles. Contact lenses should not be worn

Skin and body protection:

Wear suitable protective clothing

Respiratory protection:

NIOSH-certified organic vapor (black cartridge) respirator.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state: Liquid
Appearance: Clear liquid.
Molecular mass: 262.42 g/mol
Color: Straw.
Odor: Mild.
Odor threshold: No data available
Refractive index: 1.4254 @ 25°C
pH: No data available
Relative evaporation rate (butyl acetate=1): No data available
Melting point: No data available
Freezing point: < 0 °C
Boiling point: 115 - 119 °C @ 1.5 mm Hg
Flash point: 99 °C
Auto-ignition temperature: No data available
Decomposition temperature: No data available
Flammability (solid, gas): No data available
Vapor pressure: < 0.1 mm Hg @ 25°C
Relative vapor density at 20 °C: > 1
Relative density: 0.96
Solubility: Reacts with water.
Log Pow: No data available
Log Kow: No data available
Viscosity, kinematic: No data available
Viscosity, dynamic: No data available
5,6-EPOXYHEXYLTRIETHOXYSILANE
Safety Data Sheet

Explosive properties: No data available
Oxidizing properties: No data available
Explosion limits: No data available

9.2. Other information
No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity
Can react exothermically with amines.

10.2. Chemical stability
Stable in sealed containers.

10.3. Possibility of hazardous reactions
Reacts with water and moisture in air, liberating ethanol. Can polymerize (non-hazardous) in the presence of weak acids.

10.4. Conditions to avoid
Heat. Open flame. Sparks.

10.5. Incompatible materials

10.6. Hazardous decomposition products
Ethanol. Organic acid vapors.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity: Not classified

Ethanol (64-17-5)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD50 oral rat</td>
<td>7060 mg/kg</td>
</tr>
<tr>
<td>LC50 inhalation rat (mg/l)</td>
<td>124.7 mg/l/4h</td>
</tr>
<tr>
<td>LC50 inhalation rat (ppm)</td>
<td>20000 ppm 10 hrs.</td>
</tr>
<tr>
<td>LDLo oral rat</td>
<td>1400 mg/kg (Human)</td>
</tr>
<tr>
<td>ATE US (oral)</td>
<td>7060 mg/kg body weight</td>
</tr>
<tr>
<td>ATE US (vapors)</td>
<td>124.7 mg/l/4h</td>
</tr>
<tr>
<td>ATE US (dust, mist)</td>
<td>124.7 mg/l/4h</td>
</tr>
</tbody>
</table>

Skin corrosion/irritation: Not classified
Serious eye damage/irritation: Causes serious eye irritation.
Respiratory or skin sensitization: Not classified
Germ cell mutagenicity: Not classified

The related compound, (epoxycyclohexyl)ethyltrimethoxysilane, has been found to be mutagenic in Ames in vitro screening, sister chromatid exchange test in mouse lymphoma cells, unscheduled DNA synthesis in human WI-38 cells, and a forward gene mutation assay in mouse lymphoma cells.

Carcinogenicity: Not classified

Ethanol (64-17-5)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>IARC group</td>
<td>1 - Carcinogenic to humans</td>
</tr>
<tr>
<td>In OSHA Hazard Communication Carcinogen list</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Reproductive toxicity: Not classified
Specific target organ toxicity – single exposure: Not classified
Specific target organ toxicity – repeated exposure: Not classified
Aspiration hazard: Not classified
Symptoms/effects after inhalation: May cause irritation to the respiratory tract. Overexposure may cause: Cough. Headache. Nausea.
Symptoms/effects after skin contact: May cause skin irritation.
Symptoms/effects after eye contact: Causes serious eye irritation.
Symptoms/effects after ingestion: No information available.
### SECTION 12: Ecological information

#### 12.1. Toxicity

<table>
<thead>
<tr>
<th>Substance</th>
<th>LC50 fish 1</th>
<th>LC50 fish 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol (64-17-5)</td>
<td>&gt; 10000 mg/l [Exposure time: 96 h - Species: Oncorhynchus mykiss [static]]</td>
<td>&gt; 13400 mg/l [Exposure time: 96 h - Species: Pimephales promelas [static]]</td>
</tr>
</tbody>
</table>

#### 12.2. Persistence and degradability
No additional information available

#### 12.3. Bioaccumulative potential

<table>
<thead>
<tr>
<th>Substance</th>
<th>Log Pow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol (64-17-5)</td>
<td>-0.32</td>
</tr>
</tbody>
</table>

#### 12.4. Mobility in soil
No additional information available

#### 12.5. Other adverse effects

- **Effect on the ozone layer**: No additional information available

### SECTION 13: Disposal considerations

#### 13.1. Disposal methods

- **Product/Packaging disposal recommendations**: May be incinerated. Dispose in a safe manner in accordance with local/national regulations. Dispose of contents/container to licensed waste disposal facility.

- **Ecology - waste materials**: Avoid release to the environment.

### SECTION 14: Transport information

#### 14.1. UN number
Not regulated for transport.

#### 14.2. UN proper shipping name
Not applicable

#### 14.3. Additional information

- **Other information**: No supplementary information available.

**Transport by sea**
No additional information available

**Air transport**
No additional information available

### SECTION 15: Regulatory information

#### 15.1. US Federal regulations

- **5,6-EPOXYHEXYLTRIETHOXYSILANE (86138-01-4)**
  - **TSCA Exemption/Exclusion**: CAUTION: This material is supplied for research and development purposes subject to the R&D exemption under TSCA, 40 CFR 720.36, and must meet the requirements of the exemption, including supervision by a "technically qualified individual" as defined by 40 CFR 720.3(ee). The use of this material for "commercial purposes" as defined by 40 CFR 720.3(r) is not permitted in the United States.

### 5,6-Epoxyhexyltriethoxysilane (86138-01-4)

- **Listed on the United States TSCA (Toxic Substances Control Act) inventory**

#### 15.2. International regulations

**CANADA**

- **Ethanol (64-17-5)**
  - Listed on the Canadian DSL (Domestic Substances List)
  - **WHMIS Classification**: Class B Division 2 - Flammable Liquid
  - Class D Division 2 Subdivision B - Toxic material causing other toxic effects
5,6-EPOXYHEXYLTRIETHOXYSILANE
Safety Data Sheet

EU-Regulations

Ethanol (64-17-5)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

National regulations

Ethanol (64-17-5)
Listed on IARC (International Agency for Research on Cancer)
Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECS (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on the Canadian IDL (Ingredient Disclosure List)
Listed on INSQ (Mexican National Inventory of Chemical Substances)
Listed on CICR (Turkish Inventory and Control of Chemicals)

15.3. US State regulations

WARNING: This product can expose you to Ethanol, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Ethanol (64-17-5)

<table>
<thead>
<tr>
<th>U.S. - California - Proposition 65 - Carcinogens List</th>
<th>U.S. - California - Proposition 65 - Developmental Toxicity</th>
<th>U.S. - California - Proposition 65 - Reproductive Toxicity - Female</th>
<th>U.S. - California - Proposition 65 - Reproductive Toxicity - Male</th>
<th>No significant risk level (NSRL)</th>
<th>Maximum allowable dose level (MADL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Ethanol (64-17-5)

<table>
<thead>
<tr>
<th>U.S. - Massachusetts - Right To Know List</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. - New Jersey - Right to Know Hazardous Substance List</td>
</tr>
<tr>
<td>U.S. - Pennsylvania - RTK (Right to Know) List</td>
</tr>
</tbody>
</table>

SECTION 16: Other information

Full text of H-phrases:

H225: Highly flammable liquid and vapor

H319: Causes serious eye irritation

Abbreviations and acronyms

- ND: Not Determined, No Data
- NA: Not Applicable
- LD: Lethal Dose
- LC: Lethal Concentration
- ATE: Acute Toxicity Estimates
- H: hour
- °: °C unless otherwise stated
- mm: millimeters Hg, torr
- PEL: permissible exposure level
- TWA: time weighted average
- TLV: threshold limit value
- TG: Test Guideline
- NIOSH: National Institute for Occupational Safety and Health
- IARC: International Agency for Research on Cancer
- NTP: National Toxicology Program
- HMIS: Hazardous Material Information System
- CAS No.: Chemical Abstract Service Registration Number
- EC No.: European Commission Registration Number
- EC Index No.: European Commission Index Number
- OECD: The Organisation for Economic Co-operation and Development
- GHS: The Globally Harmonized System of Classification and Labelling
- APF: Assigned Protection Factor

Hazard Rating

Health: 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given

Flammability: 2 Moderate Hazard - Materials which must be moderately heated or exposed to high ambient temperatures before ignition will occur. Includes liquids having a flash point at or above 100 F but below 200 F. (Classes II & IIIA)

Physical: 1 Slight Hazard - Materials that are normally stable but can become unstable (self-react) at high temperatures and pressures. Materials may react non-violently with water or undergo hazardous polymerization in the absence of inhibitors.

Prepared by safety and environmental affairs.

Date of issue: 01/06/2015 Version: 1.0

SDS US (GHS HazCom 2012) - Custom

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations
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