SECTION 1: Identification

1.1. Identification
- **Product name**: THALLIUM(I) ETHOXIDE
- **Product code**: AKT825
- **Product form**: Substance
- **Physical state**: Liquid
- **Formula**: C2H5OTl
- **Synonyms**: ETHOXYTHALLIUM, THALLIUM ETHYLATED, THALLOUS ETHOXIDE, THALLIUM(I) ETHANOLATE
- **Chemical family**: METAL COMPOUND

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**
  - Acute toxicity (oral) Category 2: H300 - Fatal if swallowed
  - Acute toxicity (inhalation) Category 2: H330 - Fatal if inhaled
  - Specific target organ toxicity (repeated exposure) Category 2: H373 - May cause damage to organs through prolonged or repeated exposure
  - Hazardous to the aquatic environment - Chronic Hazard Category 2: H411 - Toxic to aquatic life with long lasting effects

Full text of H statements: see section 16

2.2. GHS Label elements, including precautionary statements
- **GHS US labeling**
  - **Signal word (GHS US)**: Danger
  - **Hazard pictograms (GHS US)**: 🎯 🎯
  - **Hazard statements (GHS US)**: 
    - H300+H330 - Fatal if swallowed or if inhaled
    - H373 - May cause damage to organs through prolonged or repeated exposure
    - H411 - Toxic to aquatic life with long lasting effects
  - **Precautionary statements (GHS US)**: 
    - P260 - Do not breathe vapors.
    - P284 - [In case of inadequate ventilation] wear respiratory protection.
    - P264 - Wash hands thoroughly after handling.
    - P270 - Do not eat, drink or smoke when using this product.
    - P271 - Use only outdoors or in a well-ventilated area.
    - P273 - Avoid release to the environment.
    - P310 - Immediately call a POISON CENTER
    - P330 - Rinse mouth.
    - P301+P310 - If swallowed: Immediately call a POISON CENTER
    - P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing.
    - P314 - Get medical advice/attention if you feel unwell.
    - P320 - Specific treatment is urgent (see first aid instructions on this label)
    - P331 - Collect spillage.
    - P403+P233 - Store in a well-ventilated place. Keep container tightly closed.
    - P405 - Store locked up.
THALLIUM(I) ETHOXIDE
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2.3. Hazards not otherwise classified (HNOC)
No additional information available

2.4. Unknown acute toxicity (GHS US)
Not applicable

SECTION 3: Composition/Information on ingredients

3.1. Substances
Substance type : Mono-constituent
Name : THALLIUM(I) ETHOXIDE
CAS-No. : 20398-06-5

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
<th>GHS-US classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thallium(I) ethoxide</td>
<td>(CAS-No.) 20398-06-5</td>
<td>95 - 100</td>
<td>Acute Tox. 2 (Oral), H300 Acute Tox. 2 (Inhalation), H330 STOT RE 2, H373 Aquatic Chronic 2, H411</td>
</tr>
</tbody>
</table>

Full text of hazard classes and H-statements : see section 16

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. Immediately call a poison center or doctor/physician.

First-aid measures after skin contact : Wash with plenty of soap and water. Get medical advice/attention.

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. Immediately call a poison center or doctor/physician.

4.2. Most important symptoms and effects (acute and delayed)
Symptoms/effects : May cause damage to organs through prolonged or repeated exposure.
Symptoms/effects after inhalation : Fatal if inhaled. May cause irritation to the respiratory tract.
Symptoms/effects after skin contact : May cause skin irritation.
Symptoms/effects after eye contact : May cause eye irritation.
Symptoms/effects after ingestion : Swallowing a small quantity of this material will result in serious health hazard. Fatal if swallowed.

Chronic symptoms : Note: The hydrolysis products of thallium ethoxide are thallium oxides and ethanol. Of primary concern is the toxic effect of thallium. However, overexposure to ethanol by skin absorption, inhalation or ingestion may have a narcotic effect.

4.3. Immediate medical attention and special treatment, if necessary
(Note to physician: The following treatment for thallium metal poisoning has recommended by the International Technical Information Institute. The applicability to thallium ethoxide poisoning has not been determined. Treat swallowing by inducing vomiting, practice stomach was with 1% sodium iodide solution, followed by saline catharsis and then provide laxative. Prescribe 10cc of 10% sodium thiosulfate solution intravenously three times daily.)

SECTION 5: Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media
Unsuitable extinguishing media : Do not use straight streams.

5.2. Specific hazards arising from the chemical
Fire hazard : Toxic, irritating fumes and organic acid vapors will develop when material is exposed to elevated temperatures or open flame.

5.3. Special protective equipment and precautions for fire-fighters
Firefighting instructions : 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. Leave area of fire unless equipped with a self-contained breathing apparatus.
SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Protective equipment: Wear protective equipment as described in Section 8.
Emergency procedures: Evacuate unnecessary personnel.

6.1.2. For emergency responders

Protective equipment: Do not attempt to take action without suitable protective equipment. Equip cleanup crew with proper protection. For further information refer to section 8: “Exposure controls/personal protection”.

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters. Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

For containment: Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.
Methods for cleaning up: Collect spillage. Clean up any spills as soon as possible, using an absorbent material to collect it.

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: Avoid all eye and skin contact and do not breathe vapor and mist. Use only outdoors or in a well-ventilated area.
Hygiene measures: Wash contaminated clothing before reuse. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures: Physical Examination: Physical examinations of exposed personnel should be conducted annually, with special attention to vision and weight, and including a complete blood count, urinalysis and studies of kidney and liver function.
Storage conditions: Keep container tightly closed. Store locked up.
Incompatible materials: Oxidizing agent.
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></th>
<th>ACGIH TWA (mg/m³)</th>
<th>OSHA PEL (TWA) (mg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thallium(I) ethoxide</td>
<td>0.1 mg/m³ (Tl)</td>
<td>0.1 mg/m³ (Tl)</td>
</tr>
</tbody>
</table>

8.2. Appropriate engineering controls

Appropriate engineering controls: Handle in an enclosing hood with exhaust 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:
Where exposure through inhalation may occur from use, respiratory protection equipment is recommended. NIOSH-certified dust and mist (teal cartridge) respirator.
THALLIUM(I) ETHOXIDE
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SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Liquid</td>
</tr>
<tr>
<td>Appearance</td>
<td>Hazy liquid.</td>
</tr>
<tr>
<td>Molecular mass</td>
<td>249.43 g/mol</td>
</tr>
<tr>
<td>Color</td>
<td>No data available</td>
</tr>
<tr>
<td>Odor</td>
<td>No data available</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>Refractive index</td>
<td>1.6714</td>
</tr>
<tr>
<td>pH</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative evaporation rate (butyl acetate=1)</td>
<td>No data available</td>
</tr>
<tr>
<td>Melting point</td>
<td>-3 °C</td>
</tr>
<tr>
<td>Freezing point</td>
<td>No data available</td>
</tr>
<tr>
<td>Boiling point</td>
<td>130 °C decomposes</td>
</tr>
<tr>
<td>Flash point</td>
<td>&gt; 110 °C</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative vapor density at 20 °C</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative density</td>
<td>3.493</td>
</tr>
<tr>
<td>Solubility</td>
<td>Reacts with water.</td>
</tr>
<tr>
<td>Log Pow</td>
<td>No data available</td>
</tr>
<tr>
<td>Log Kow</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity, kinematic</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity, dynamic</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>No data available</td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosion limits</td>
<td>No data available</td>
</tr>
</tbody>
</table>

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity
No additional information available

10.2. Chemical stability
Stable.

10.3. Possibility of hazardous reactions
Material decomposes slowly in contact with air by reaction with water and carbon dioxide, liberating ethanol.

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

10.5. Incompatible materials
Oxidizing agent.

10.6. Hazardous decomposition products
Ethanol. Organic acid vapors.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

<table>
<thead>
<tr>
<th>Toxicity</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>THALLIUM(I) ETHOXIDE (20398-06-5)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Toxicity</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATE US (oral)</td>
<td>5 mg/kg body weight</td>
</tr>
<tr>
<td>ATE US (gases)</td>
<td>100 ppmV/4h</td>
</tr>
<tr>
<td>ATE US (vapors)</td>
<td>0.5 mg/l/4h</td>
</tr>
<tr>
<td>ATE US (dust, mist)</td>
<td>0.05 mg/l/4h</td>
</tr>
<tr>
<td>Toxicity information</td>
<td>50 mg/kg LDLo, rat: thallium; Oral toxicity of thallium ethoxide has not been determined.</td>
</tr>
</tbody>
</table>
Thallium(I) ethoxide (20398-06-5)

<table>
<thead>
<tr>
<th>Exposure Route</th>
<th>Limit Value</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATE US (oral)</td>
<td>5 mg/kg body weight</td>
<td></td>
</tr>
<tr>
<td>ATE US (gases)</td>
<td>100 ppmV/4h</td>
<td></td>
</tr>
<tr>
<td>ATE US (vapors)</td>
<td>0.5 mg/l/4h</td>
<td></td>
</tr>
<tr>
<td>ATE US (dust, mist)</td>
<td>0.05 mg/l/4h</td>
<td></td>
</tr>
</tbody>
</table>

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

None of the components in this product at concentrations >0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

Reproductive toxicity: Not classified
Specific target organ toxicity – single exposure: Not classified
Specific target organ toxicity – repeated exposure: May cause damage to organs through prolonged or repeated exposure.
Aspiration hazard: Not classified
Potential Adverse human health effects and symptoms: Acute poisoning may occur. Can be fatal. Possible effects include paralysis, joint pain, hair loss. At lower levels or onset of exposure swelling of the feet and legs, vomiting, angina-like pain, nephritis and mental confusion may occur.
Symptoms/effects after inhalation: Fatal if inhaled. May cause irritation to the respiratory tract.
Symptoms/effects after skin contact: May cause skin irritation.
Symptoms/effects after eye contact: May cause eye irritation.
Symptoms/effects after ingestion: Swallowing a small quantity of this material will result in serious health hazard. Fatal if swallowed.

Chronic symptoms: Note: The hydrolysis products of thallium ethoxide are thallium oxides and ethanol. Of primary concern is the toxic effect of thallium. However, overexposure to ethanol by skin absorption, inhalation or ingestion may have a narcotic effect.

SECTION 12: Ecological information

12.1. Toxicity
Ecology - general: Toxic to aquatic life with long lasting effects.

12.2. Persistence and degradability
No additional information available

12.3. Bioaccumulative potential
No additional information available

12.4. Mobility in soil
No additional information available

12.5. Other adverse effects
Other adverse effects: This substance may be hazardous to the environment.
Effect on the ozone layer: No additional information available

SECTION 13: Disposal considerations

13.1. Disposal methods
Sewage disposal recommendations: Do not dispose of waste into sewer.
Product/Packaging disposal recommendations: 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
UN-No.(DOT) : 1707
DOT NA no. : UN1707

14.2. UN proper shipping name
Transport document description : UN1707 Thallium compounds, n.o.s. (THALLIUM(I) ETHOXIDE), 6.1, II
# THALLIUM(I) ETHOXIDE

Safety Data Sheet

| Proper Shipping Name (DOT) | Thallium compounds, n.o.s.  
| (THALLIUM(I) ETHOXIDE) |
| Class (DOT) | 6.1 - Class 6.1 - Poisonous materials 49 CFR 173.132 |
| Packing group (DOT) | II - Medium Danger |
| Hazard labels (DOT) | 6.1 - Poison |

- Dangerous for the environment: Yes
- Marine pollutant: Yes

| DOT Packaging Non Bulk (49 CFR 173.xxx) | 212 |
| DOT Packaging Bulk (49 CFR 173.xxx) | 242 |
| DOT Packaging Exceptions (49 CFR 173.xxx) | 153 |
| DOT Symbols | G - Identifies PSN requiring a technical name |

## 14.3. Additional information

| Emergency Response Guide (ERG) Number | 151 |
| Other information | No supplementary information available. |

### Transport by sea

- DOT Vessel Stowage Location: A - The material may be stowed “on deck” or “under deck” on a cargo vessel and on a passenger vessel.

### Air transport

- DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27): 25 kg
- DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75): 100 kg

## SECTION 15: Regulatory information

### 15.1. US Federal regulations

- **Thallium(I) ethoxide (20398-06-5)**  
  Listed on the United States TSCA (Toxic Substances Control Act) inventory

### 15.2. International regulations

#### CANADA

- **Thallium(I) ethoxide (20398-06-5)**  
  Listed on the Canadian NDSL (Non-Domestic Substances List)

#### EU-Regulations

- **Thallium(I) ethoxide (20398-06-5)**  
  Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

### National regulations

- **Thallium(I) ethoxide (20398-06-5)**  
  Listed on the AICS (Australian Inventory of Chemical Substances)  
  Listed on NZIoC (New Zealand Inventory of Chemicals)  
  Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)

### 15.3. US State regulations

- California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

## SECTION 16: Other information
THALLIUM(I) ETHOXIDE
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Full text of H-phrases:

<table>
<thead>
<tr>
<th>H-Phrase</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>H300</td>
<td>Fatal if swallowed</td>
</tr>
<tr>
<td>H330</td>
<td>Fatal if inhaled</td>
</tr>
<tr>
<td>H373</td>
<td>May cause damage to organs through prolonged or repeated exposure</td>
</tr>
<tr>
<td>H411</td>
<td>Toxic to aquatic life with long lasting effects</td>
</tr>
</tbody>
</table>

Abbreviations and acronyms:

- Abbreviations: 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: 06/01/2017
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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EN (English US) SDS ID: AKT825