1 Identification

· Product name
· Trade name: Trichlorotris(tetrahydrofuran)titanium(III), min. 97%
· Item number: 22-3500
· CAS Number: 18039-90-2

Details of the supplier of the safety data sheet
· Manufacturer/Supplier: Strem Chemicals, Inc.
  7 Mulliken Way
  NEWBURYPORT, MA 01950
  USA
  info@strem.com

· Information department: Technical Department
· Emergency telephone number:
  EMERGENCY: CHEMTREC: + 1 (800) 424-9300
  During normal opening times: +1 (978) 499-1600

2 Hazard(s) identification

· Classification of the substance or mixture

  GHS02 Flame
  Flam. Sol. 1  H228 Flammable solid.

  GHS07
  Skin Irrit. 2  H315 Causes skin irritation.
  Eye Irrit. 2A H319 Causes serious eye irritation.
  STOT SE 3  H335 May cause respiratory irritation.

· Label elements
· GHS label elements
  The substance is classified and labeled according to the Globally Harmonized System (GHS).
· Hazard pictograms

  GHS02  GHS07

· Signal word Danger

· Hazard-determining components of labeling:
  Trichlorotris(tetrahydrofuran)titanium(III), min. 97%
· Hazard statements
  H228 Flammable solid.
  H315 Causes skin irritation.
  H319 Causes serious eye irritation.
  H335 May cause respiratory irritation.

(Contd. on page 2)


Trade name: Trichlorotris(tetrahydrofuran)titanium(III), min. 97%

- Precautionary statements
  - P231 Handle under inert gas.
  - P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
  - P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
  - P403+P233 Store in a well-ventilated place. Keep container tightly closed.
  - P422 Store contents under inert gas.
  - P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

- Classification system:
  - NFPA ratings (scale 0 - 4)
    - Health = 1
    - Fire = 2
    - Reactivity = 0
  - HMIS-ratings (scale 0 - 4)
    - Health = 1
    - Fire = 0
    - Reactivity = 0

- Other hazards
  - Results of PBT and vPvB assessment
    - PBT: Not applicable.
    - vPvB: Not applicable.

3 Composition/information on ingredients

- Chemical characterization: Substances
- CAS No. Description
  18039-90-2 Trichlorotris(tetrahydrofuran)titanium(III), min. 97%

4 First-aid measures

- Description of first aid measures
  - General information: Immediately remove any clothing soiled by the product.
  - After inhalation: In case of unconsciousness place patient stably in side position for transportation.
  - After skin contact: Immediately wash with water and soap and rinse thoroughly.
  - After eye contact:
    - Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
  - After swallowing: If symptoms persist consult doctor.
- Information for doctor:
  - Most important symptoms and effects, both acute and delayed No further relevant information available.
  - Indication of any immediate medical attention and special treatment needed
    - No further relevant information available.

5 Fire-fighting measures

- Extinguishing media
  - Suitable extinguishing agents:
    - CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
Trade name: Trichlorotris(tetrahydrofuran)titanium(III), min. 97%

6 Accidental release measures

- Special hazards arising from the substance or mixture: No further relevant information available.
- Advice for firefighters:
  - Protective equipment: No special measures required.

7 Handling and storage

- Handling: Handle under inert gas.
- Precautions for safe handling:
  - Environmental precautions: No special measures required.
  - Methods and material for containment and cleaning up:
    - Dispose contaminated material as waste according to item 13.
    - Ensure adequate ventilation.
- 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.

8 Exposure controls/personal protection

- Additional information about design of technical systems: No further data; see item 7.
- Control parameters
- Components with limit values that require monitoring at the workplace: Not required.
- Additional information: The lists that were valid during the creation were used as basis.
- Exposure controls
  - Personal protective equipment:
  - General protective and hygienic measures:
    - Keep away from foodstuffs, beverages and feed.
    - Immediately remove all soiled and contaminated clothing.
    - Wash hands before breaks and at the end of work.
    - Avoid contact with the eyes and skin.
· **Breathing equipment:**
   In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

· **Protection of hands:**
   **Protective gloves**
   The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture. Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation.

· **Material of gloves**
   The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

· **Penetration time of glove material**
   The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

· **Eye protection:**
   **Tightly sealed goggles**

### 9 Physical and chemical properties

· **Information on basic physical and chemical properties**

· **General Information**

   - **Appearance:**
     - **Form:** Crystalline
     - **Color:** Light blue
     - **Odor:** Acidic
     - **Odor threshold:** Not determined.

     - **pH-value:** Not applicable.

   - **Change in condition**
     - **Melting point/Melting range:** no data °C
     - **Boiling point/Boiling range:** decomposes °C

     - **Flash point:** Not applicable.

     - **Flammability (solid, gaseous):** Flammable.

     - **Ignition temperature:**
       - **Decomposition temperature:** Not determined.
     - **Auto igniting:** Not determined.
     - **Danger of explosion:** Not determined.

   - **Explosion limits:**
     - **Lower:** Not determined.
     - **Upper:** Not determined.
### 10 Stability and reactivity

- **Reactivity**: No further relevant information available.
- **Chemical stability**: No decomposition if used according to specifications.
- **Thermal decomposition / conditions to be avoided**:
- **Possibility of hazardous reactions**: No dangerous reactions known.
- **Conditions to avoid**: No further relevant information available.
- **Incompatible materials**: No further relevant information available.
- **Hazardous decomposition products**: No dangerous decomposition products known.

### 11 Toxicological information

- **Information on toxicological effects**
- **Acute toxicity**:
- **Primary irritant effect**:
  - **on the skin**: Irritant to skin and mucous membranes.
  - **on the eye**: Irritating effect.
- **Sensitization**: No sensitizing effects known.
- **Additional toxicological information**:
- **Carcinogenic categories**
- **IARC (International Agency for Research on Cancer)**
  Substance is not listed.
- **NTP (National Toxicology Program)**
  Substance is not listed.
- **OSHA-Ca (Occupational Safety & Health Administration)**
  Substance is not listed.
12 Ecological information

- **Toxicity**
- **Aquatic toxicity:** No further relevant information available.
- **Persistence and degradability** No further relevant information available.
- **Behavior in environmental systems:**
  - **Bioaccumulative potential** No further relevant information available.
  - **Mobility in soil** No further relevant information available.
- **Additional ecological information:**
  - **General notes:** Not known to be hazardous to water.
  - **Results of PBT and vPvB assessment**
    - **PBT:** Not applicable.
    - **vPvB:** Not applicable.
  - **Other adverse effects** No further relevant information available.

13 Disposal considerations

- **Waste treatment methods**
- **Recommendation:**
  Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
- **Uncleaned packagings:**
  - **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

- **UN-Number**
  - DOT, IMDG, IATA: UN1325
- **UN proper shipping name**
  - DOT, IATA: Flammable solids, organic, n.o.s.
  - IMDG: FLAMMABLE SOLID, ORGANIC, N.O.S.
- **Transport hazard class(es)**
  - **DOT**
    - **Class** 4.1 Flammable solids, self-reactive substances and solid desensitised explosives
    - **Label** 4.1
  - **IMDG**
    - **Class** 4
Trade name: Trichlorotris(tetrahydrofuran)titanium(III), min. 97%

- **Label**: 4.1
- **IATA**
- **Class**: 4.1 Flammable solids, self-reactive substances and solid desensitised explosives
- **Label**: 4.1
- **Packing group**: II
- **DOT, IMDG, IATA**: II
- **Environmental hazards**: No
- **Marine pollutant**: No
- **Special precautions for user**: Not applicable.
- **EMS Number**: F-A,S-G
- **Stowage Category**: B
- **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**: Not applicable.

**Transport/Additional information**:
- **DOT**
- **Quantity limitations**: On passenger aircraft/rail: 15 kg
  On cargo aircraft only: 50 kg
- **UN "Model Regulation"**: UN 1325 FLAMMABLE SOLIDS, ORGANIC, N.O.S., 4.1, II

### 15 Regulatory information

- **Safety, health and environmental regulations/legislation specific for the substance or mixture**
- **Sara**
  - **Section 355 (extremely hazardous substances)**:
    Substance is not listed.
  - **Section 313 (Specific toxic chemical listings)**:
    Substance is not listed.
  - **TSCA (Toxic Substances Control Act)**:
    Substance is not listed.
  - **Proposition 65**
    - **Chemicals known to cause cancer**:
      Substance is not listed.
    - **Chemicals known to cause reproductive toxicity for females**:
      Substance is not listed.
    - **Chemicals known to cause reproductive toxicity for males**:
      Substance is not listed.
    - **Chemicals known to cause developmental toxicity**:
      Substance is not listed.
Trade name: Trichlorotris(tetrahydrofuran)titanium(III), min. 97%

- **Carcinogenic categories**
  - EPA (Environmental Protection Agency)
    Substance is not listed.
  - TLV (Threshold Limit Value established by ACGIH)
    Substance is not listed.
  - NIOSH-Ca (National Institute for Occupational Safety and Health)
    Substance is not listed.
- **GHS label elements**
  - The substance is classified and labeled according to the Globally Harmonized System (GHS).
- **Hazard pictograms**
  - GHS02
  - GHS07
- **Signal word** Danger
- **Hazard-determining components of labeling:**
  - Trichlorotris(tetrahydrofuran)titanium(III), min. 97%
- **Hazard statements**
  - H228 Flammable solid.
  - H315 Causes skin irritation.
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  - P403+P233 Store in a well-ventilated place. Keep container tightly closed.
  - P422 Store contents under inert gas.
  - P501 Dispose of contents/container in accordance with local/regional/national/international regulations.
- **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- **Department issuing SDS:** Technical Department.
- **Contact:** Technical Director
- **Date of preparation / last revision** 07/30/2016 / -
- **Abbreviations and acronyms:**
  - ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
  - IMDG: International Maritime Code for Dangerous Goods
  - DOT: US Department of Transportation
  - IATA: International Air Transport Association
  - ACGIH: American Conference of Governmental Industrial Hygienists
  - CAS: Chemical Abstracts Service (division of the American Chemical Society)
  - NFPA: National Fire Protection Association (USA)
  - HMIS: Hazardous Materials Identification System (USA)
  - VOC: Volatile Organic Compounds (USA, EU)
**Trade name: Trichlorotris(tetrahydrofuran)titanium(III), min. 97%**

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>PBT</td>
<td>Persistent, Bioaccumulative and Toxic</td>
</tr>
<tr>
<td>vPvB</td>
<td>very Persistent and very Bioaccumulative</td>
</tr>
<tr>
<td>NIOSH</td>
<td>National Institute for Occupational Safety</td>
</tr>
<tr>
<td>OSHA</td>
<td>Occupational Safety &amp; Health</td>
</tr>
<tr>
<td>TLV</td>
<td>Threshold Limit Value</td>
</tr>
<tr>
<td>PEL</td>
<td>Permissible Exposure Limit</td>
</tr>
<tr>
<td>REL</td>
<td>Recommended Exposure Limit</td>
</tr>
<tr>
<td>Flam. Sol. 1</td>
<td>Flammable solids, Hazard Category 1</td>
</tr>
<tr>
<td>Skin Irrit. 2</td>
<td>Skin corrosion/irritation, Hazard Category 2</td>
</tr>
<tr>
<td>Eye Irrit. 2A</td>
<td>Serious eye damage/eye irritation, Hazard Category 2A</td>
</tr>
<tr>
<td>STOT SE 3</td>
<td>Specific target organ toxicity - Single exposure, Hazard Category 3</td>
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</tbody>
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