1 Identification

- Product name
- Trade name: Cerium(III) fluoride (99.9%-Ce) (REO)
- Item number: 93-5825
- CAS Number: 7758-88-5
- EC number: 231-841-3

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

  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

  GHS07

- Signal word Warning

- Hazard-determining components of labeling:
  cerium trifluoride

- Hazard statements
  H315 Causes skin irritation.
  H319 Causes serious eye irritation.
  H335 May cause respiratory irritation.

- Precautionary statements
  P231 Handle under inert gas.
  P262 Do not get in eyes, on skin, or on clothing.
  P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Safety Data Sheet  
according to OSHA HCS

Printing date 02/07/2016  
Reviewed on 02/07/2016

Trade name: Cerium(III) fluoride (99.9%-Ce) (REO)

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 = 0
  - 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
  - 7758-88-5 cerium trifluoride
- Identification number(s)
  - EC number: 231-841-3

4 First-aid measures

- Description of first aid measures
  - 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.
- Special hazards arising from the substance or mixture: No further relevant information available.
### 6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures** Not required.
- **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.

### 7 Handling and storage

- **Handling:**
  - **Precautions for safe handling** Open and handle receptacle with care.
  - **Information about protection against explosions and fires:** No special measures required.
- **Conditions for safe storage, including any incompatibilities**
- **Storage:**
  - **Requirements to be met by storerooms and receptacles:** No special requirements.
  - **Information about storage in one common storage facility:** Not required.
  - **Further information about storage conditions:**
    - Keep receptacle tightly sealed.
    - Store in cool, dry conditions in well sealed receptacles.
- **Specific end use(s)** No further relevant information available.

### 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:**
    | Component | Long-term value | Limit as F |
    |-----------|-----------------|------------|
    | 7758-88-5 cerium trifluoride | 2.5 mg/m³ | F |
    | PEL | 2.5 mg/m³ | F |
    | REL | 2.5 mg/m³ | F, BEI |
Trade name: Cerium(III) fluoride (99.9%-Ce) (REO)

- Ingredients with biological limit values:

<table>
<thead>
<tr>
<th>BEI</th>
<th>2 mg/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium: urine</td>
<td></td>
</tr>
<tr>
<td>Time: prior to shift</td>
<td></td>
</tr>
<tr>
<td>Parameter: Fluoride (background, nonspecific)</td>
<td></td>
</tr>
</tbody>
</table>

3 mg/L
Medium: urine
Time: end of shift
Parameter: Fluoride (background, nonspecific)

- 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: Powder
    - Color: Whitish
### Trade name: Cerium(III) fluoride (99.9%-Ce) (REO)

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odor</td>
<td>Odorless</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>Not determined.</td>
</tr>
<tr>
<td>pH-value</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Change in condition</td>
<td></td>
</tr>
<tr>
<td>Melting point/Melting range</td>
<td>1460 °C (2660 °F)</td>
</tr>
<tr>
<td>Boiling point/Boiling range</td>
<td>~2300 °C (~4172 °F)</td>
</tr>
<tr>
<td>Flash point</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Flammability (solid, gaseous)</td>
<td>Product is not flammable.</td>
</tr>
<tr>
<td>Ignition temperature</td>
<td></td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Auto igniting</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Danger of explosion</td>
<td>Product does not present an explosion hazard.</td>
</tr>
<tr>
<td>Explosion limits</td>
<td></td>
</tr>
<tr>
<td>Lower</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Upper</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Flash point</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Boiling point</td>
<td></td>
</tr>
<tr>
<td>explosive gas</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Flammable gas</td>
<td>Product is not flammable.</td>
</tr>
<tr>
<td>Flammable solid</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Flammable fluid</td>
<td>Product is not flammable.</td>
</tr>
<tr>
<td>Explosive of solid</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Flammable of liquid</td>
<td>Product is not flammable.</td>
</tr>
<tr>
<td>Flammable of gas</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Explosive of gas</td>
<td>Product is not flammable.</td>
</tr>
<tr>
<td>Flammable of solid</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Flammable of liquid</td>
<td>Product is not flammable.</td>
</tr>
<tr>
<td>Flammable of gas</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Explosive of solid</td>
<td>Product is not flammable.</td>
</tr>
<tr>
<td>Flammable of liquid</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Flammable of gas</td>
<td>Product is not flammable.</td>
</tr>
<tr>
<td>Flammable of solid</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Flammable of liquid</td>
<td>Product is not flammable.</td>
</tr>
<tr>
<td>Flammable of gas</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Explosive of solid</td>
<td>Product is not flammable.</td>
</tr>
<tr>
<td>Flammable of liquid</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Flammable of gas</td>
<td>Product is not flammable.</td>
</tr>
<tr>
<td>Flammable of solid</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Flammable of liquid</td>
<td>Product is not flammable.</td>
</tr>
<tr>
<td>Flammable of gas</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Explosive of solid</td>
<td>Product is not flammable.</td>
</tr>
<tr>
<td>Flammable of liquid</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Flammable of gas</td>
<td>Product is not flammable.</td>
</tr>
<tr>
<td>Flammable of solid</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Flammable of liquid</td>
<td>Product is not flammable.</td>
</tr>
<tr>
<td>Flammable of gas</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Explosive of solid</td>
<td>Product is not flammable.</td>
</tr>
<tr>
<td>Flammable of liquid</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Flammable of gas</td>
<td>Product is not flammable.</td>
</tr>
<tr>
<td>Flammable of solid</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Flammable of liquid</td>
<td>Product is not flammable.</td>
</tr>
<tr>
<td>Flammable of gas</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Explosive of solid</td>
<td>Product is not flammable.</td>
</tr>
<tr>
<td>Flammable of liquid</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Flammable of gas</td>
<td>Product is not flammable.</td>
</tr>
<tr>
<td>Flammable of solid</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Flammable of liquid</td>
<td>Product is not flammable.</td>
</tr>
<tr>
<td>Flammable of gas</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Explosive of solid</td>
<td>Product is not flammable.</td>
</tr>
<tr>
<td>Flammable of liquid</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Flammable of gas</td>
<td>Product is not flammable.</td>
</tr>
<tr>
<td>Flammable of solid</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Flammable of liquid</td>
<td>Product is not flammable.</td>
</tr>
<tr>
<td>Flammable of gas</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Explosive of solid</td>
<td>Product is not flammable.</td>
</tr>
<tr>
<td>Flammable of liquid</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Flammable of gas</td>
<td>Product is not flammable.</td>
</tr>
<tr>
<td>Flammable of solid</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Flammable of liquid</td>
<td>Product is not flammable.</td>
</tr>
<tr>
<td>Flammable of gas</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Explosive of solid</td>
<td>Product is not flammable.</td>
</tr>
<tr>
<td>Flammable of liquid</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Flammable of gas</td>
<td>Product is not flammable.</td>
</tr>
<tr>
<td>Flammable of solid</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Flammable of liquid</td>
<td>Product is not flammable.</td>
</tr>
<tr>
<td>Flammable of gas</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Explosive of solid</td>
<td>Product is not flammable.</td>
</tr>
<tr>
<td>Flammable of liquid</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Flammable of gas</td>
<td>Product is not flammable.</td>
</tr>
<tr>
<td>Flammable of solid</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Flammable of liquid</td>
<td>Product is not flammable.</td>
</tr>
<tr>
<td>Flammable of gas</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Explosion limits</td>
<td>No further relevant information available.</td>
</tr>
<tr>
<td>Viscosity</td>
<td></td>
</tr>
<tr>
<td>Dynamic</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Kinematic</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Solvent content</td>
<td></td>
</tr>
<tr>
<td>Organic solvents</td>
<td>0.0 %</td>
</tr>
<tr>
<td>VOC content</td>
<td>0.0 g/l / 0.00 lb/gl</td>
</tr>
<tr>
<td>Solids content</td>
<td>100.0 %</td>
</tr>
<tr>
<td>Other information</td>
<td>No further relevant information available.</td>
</tr>
</tbody>
</table>

### 10 Stability and reactivity

- Reactivity: No further relevant information available.
- Chemical stability
  - Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
  - 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)
    7758-88-5 cerium trifluoride
  - 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, ADN, IMDG, IATA: not regulated
- UN proper shipping name
  - DOT, ADN, IMDG, IATA: not regulated
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 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.

- Carcinogenic categories
  - EPA (Environmental Protection Agency)
    7758-88-5 cerium trifluoride II
  - TLV (Threshold Limit Value established by ACGIH)
    7758-88-5 cerium trifluoride A4
  - 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).
Trade name: Cerium(III) fluoride (99.9%-Ce) (REO)

- **Hazard pictograms**
  
  ![GHS07]

- **Signal word** Warning

- **Hazard-determining components of labeling:**
  cerium trifluoride

- **Hazard statements**
  H315 Causes skin irritation.
  H319 Causes serious eye irritation.
  H335 May cause respiratory irritation.

- **Precautionary statements**
  
  P231 Handle under inert gas.
  P262 Do not get in eyes, on skin, or on clothing.
  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+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** 02/07/2016/-
- **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
  EINECS: European Inventory of Existing Commercial Chemical Substances
  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)
  PBT: Persistent, Bioaccumulative and Toxic
  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
  BEI: Biological Exposure Limit
  Skin Irrit. 2: Skin corrosion/irritation, Hazard Category 2
  Eye Irrit. 2A: Serious eye damage/eye irritation, Hazard Category 2A
  STOT SE 3: Specific target organ toxicity - Single exposure, Hazard Category 3