1 Identification

- **Product name**
- **Trade name:** Zirconium(IV) fluoride (99.9%-Zr)
- **Item number:** 93-4024
- **CAS Number:** 7783-64-4
- **EC number:** 232-018-1

- **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:**
  zirconium tetrafluoride
- **Hazard statements**
  H315 Causes skin irritation.
  H319 Causes serious eye irritation.
  H335 May cause respiratory irritation.
- **Precautionary statements**
  P231  Handle under inert gas.
  P222  Do not allow contact with air.
  P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

(Contd. on page 2)
Trade name: Zirconium(IV) fluoride (99.9%-Zr)

- **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**
  - 7783-64-4 zirconium tetrafluoride
- **Identification number(s)**
  - EC number: 232-018-1

**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.
Trade name: Zirconium(IV) fluoride (99.9%-Zr)

Advice for firefighters
Protective equipment: No special measures required.

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: Handle under inert gas.
- 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: Store contents under inert gas.
  - 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: 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:
    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: White
  - Odor: Pungent
  - Odor threshold: Not determined.

· pH-value: Not applicable.

· Change in condition
  - Melting point/Melting range: ~600 subl °C (~1112 subl °F)
  - Boiling point/Boiling range: no data °C

· Flash point: Not applicable.

· Flammability (solid, gaseous): Not determined.

· Ignition temperature:
  - Decomposition temperature: Not determined.
  - Auto igniting: Not determined.
  - Danger of explosion: Product does not present an explosion hazard.

· Explosion limits:
  - Lower: Not determined.
  - Upper: Not determined.

· Vapor pressure: no data hPa

· Density at 20 °C (68 °F): 4.43 g/cm³ (36.968 lbs/gal)

· Relative density Not determined.
Trade name: Zirconium(IV) fluoride (99.9%-Zr)

- Vapor density: Not applicable.
- Evaporation rate: Not applicable.
- Solubility in / Miscibility with Water: Insoluble.
- Partition coefficient (n-octanol/water): Not determined.
- Viscosity:
  - Dynamic: Not applicable.
  - Kinematic: Not applicable.
- Solvent content:
  - Organic solvents: 0.0 %
  - VOC content: 0.0 g/l / 0.00 lb/gl
- Solids content: 100.0 %
- Other information: No further relevant information available.

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)
        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.
42. Behavior in environmental systems:
   - Bioaccumulative potential: No further relevant information available.
   - Mobility in soil: No further relevant information available.

43. 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

   - Transport hazard class(es)
     DOT, ADN, IMDG, IATA: Class not regulated

   - Packing group
     DOT, IMDG, IATA: not regulated

   - Environmental hazards:
     - Marine pollutant: No

   - Special precautions for user
     Not applicable.

   - Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code
     Not applicable.

   - UN "Model Regulation": 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.

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Trade name: Zirconium(IV) fluoride (99.9%-Zr)

· **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)**
  Substance is not listed.

· **TLV (Threshold Limit Value established by ACGIH)**
  7783-64-4 zirconium tetrafluoride

· **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**
  ! [GHS07]

· **Signal word** Warning

· **Hazard-determining components of labeling:**
  zirconium tetrafluoride

· **Hazard statements**
  H315 Causes skin irritation.
  H319 Causes serious eye 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.
Trade name: Zirconium(IV) fluoride (99.9%-Zr)

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: 07/31/2016 / -

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
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