Section 1: PRODUCT AND COMPANY IDENTIFICATION

A  Product Name
Zirconium Tetrachloride

Synonyms
Zirconium Tetrachloride: Zirconium Chloride (Product #305)

Product Code
SAC022

UN/ID No.
2503

B  Recommended Use
Zirconium Compounds

Uses advised against

C  Supplier
Manufacturer
ATI, 1000 Six PPG Place, Pittsburgh, PA 15222 USA

Emergency Telephone
Chemtrec +1 703-741-5970

Section 2: HAZARDS IDENTIFICATION

A  GHS - Classification

<table>
<thead>
<tr>
<th>Skin corrosion/irritation</th>
<th>Category 1</th>
<th>Sub-category B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrosive to metals</td>
<td>Category 1</td>
<td></td>
</tr>
</tbody>
</table>

B  Label elements

Emergency Overview

Signal word
Danger

Hazard statements
H290 - May be corrosive to metals

H314 - Causes severe skin burns and eye damage

Appearance  powder  Physical state  Solid  Odor  Pungent, Slight chlorine

Precautionary Statements - Prevention
- Wear protective gloves/protective clothing/eye protection/face protection
- Do not breathe dust/gas/mist
- IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
- Immediately call a POISON CENTER or doctor/physician
- IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
Section 3: COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Synonyms</th>
<th>Zirconium Tetrachloride: Zirconium Chloride, (Product #305).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Name</td>
<td>CAS No.</td>
</tr>
<tr>
<td>Zirconium Tetrachloride</td>
<td>10026-11-6</td>
</tr>
</tbody>
</table>

Section 4: FIRST AID MEASURES

A Eye contact  
Flush with water for 15 minutes. See a physician

B Skin Contact  
Brush off loose particles from skin. Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

C Inhalation  
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a physician or poison control center immediately.

D Ingestion  
Do NOT induce vomiting. Have patient drink large quantities of water if able. Call Physician immediately for further instructions.

E Symptoms  
May cause acute gastrointestinal effects if swallowed. Contact with moist skin may cause skin burns. May cause breathing difficulties if inhaled.

F. Indication of immediate medical attention and special treatment needed, if necessary  
Treat symptomatically.

Section 5: FIRE FIGHTING MEASURES

A Suitable extinguishing media  
Non-combustible

Unsuitable extinguishing media  
If a fire occurs in the area, avoid water contact with the product to prevent evolution of hazardous gases

B Specific hazards arising from the chemical  
Non-combustible

Hazardous combustion products  
Not applicable.

C Special protective equipment for fire-fighters  
Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear.

Section 6: ACCIDENTAL RELEASE MEASURES
A Personal precautions
Use personal protective equipment as required.

For emergency responders
Use personal protective equipment as required. Follow Emergency Response Guidebook, Guide No. 137.

B Environmental precautions
Collect spillage to prevent release to the environment.

C. Methods and material for containment and cleaning up
Methods for containment
Prevent further leakage or spillage if safe to do so.

Methods for cleaning up
Sweep or shovel material into dry containers. Avoid creating uncontrolled dust. Wash the spill location thoroughly with water. Respiratory protection may be needed. Skin and eye protection should be used during cleanup.

Section 7: HANDLING AND STORAGE

A Advice on safe handling
Handle in accordance with good industrial hygiene and safety practice. Protect from moisture. Reacts with water. Ensure adequate ventilation, especially in confined areas. Handle under inert gas such as nitrogen or argon to maintain the integrity of the product.

B Storage Conditions
Keep in properly labeled containers. Keep in a dry, cool and well-ventilated place. Protect from direct sunlight. Containers may become pressurized: Handle and open container with care.

Incompatible materials
Water, alcohols, phenols, and amines. Rubber, coatings, and some plastics. Reacts with metals to produce heat and corrosive gases.

Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

A Control parameters
This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Korea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zirconium Tetrachloride</td>
<td>STEL: 10 mg/m³</td>
</tr>
<tr>
<td></td>
<td>TWA: 5 mg/m³</td>
</tr>
</tbody>
</table>

B Engineering Controls
Avoid generation of uncontrolled particles. Local exhaust ventilation during processing is recommended.

C Personal Protective Equipment
Respiratory protection
When particulates/fumes/gases are generated and if exposure limits are exceeded or irritation is experienced, proper approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.

Eye/face protection
If a risk of eye injury or irritation is present, appropriate eye protection is recommended; for example, tight-fitting goggles, foam-lined safety glasses, face shield, or other protective equipment that shields the eyes.

Skin and body protection
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

General Hygiene Considerations
Handle in accordance with good industrial hygiene and safety practice.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

A Physical state
Solid

Appearance
powder

Color
white, orange

B Odor
Pungent, Slight chlorine.

C Odor threshold
Section 10: STABILITY AND REACTIVITY

A  Stability

Stable under normal conditions

Explosion data
Sensitivity to Mechanical Impact None.
Sensitivity to Static Discharge None.

B  Possibility of Hazardous Reactions

Reacts with water
Hazardous polymerization does not occur

C  Conditions to avoid

Unintentional contact with water

D  Incompatible materials

Water, alcohols, phenols, and amines. Rubber, coatings, and some plastics. Reacts with metals to produce heat and corrosive gases.

E  Hazardous Decomposition Products

Reacts with water to produce hydrogen chloride gas or hydrochloric acid and heat

Section 11: TOXICOLOGICAL INFORMATION

A  Information on likely routes of exposure

Inhalation Product not classified.
Ingestion Product not classified.
Eye contact Causes severe eye damage.
Skin Contact Causes severe skin burns.

B  Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation Causes severe skin burns.
Serious eye damage/eye irritation
Causes severe eye damage.

Sensitization
Product not classified

Carcinogenicity
Product not classified

Germ cell mutagenicity
Product not classified

Reproductive toxicity
Product not classified

STOT - single exposure
Product not classified

STOT - repeated exposure
Product not classified

Target Organ Effects
Product not classified

Aspiration hazard
Product not classified

C Numerical measures of toxicity

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Oral LD50</th>
<th>Dermal LD50</th>
<th>Inhalation LC50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zirconium Tetrachloride</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Information on toxicological effects

Symptoms
May cause skin burns. May cause severe upper respiratory irritation if inhaled. May cause acute gastrointestinal effects if swallowed.

Section 12: ECOLOGICAL INFORMATION

A Ecotoxicity

This product as shipped is not classified for aquatic toxicity.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Algae/aquatic plants</th>
<th>Fish</th>
<th>Toxicity to microorganisms</th>
<th>Crustacea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zirconium Tetrachloride</td>
<td>The 14 d NOEC of zirconium tetrachloride to Chlorella vulgaris was greater than 262 mg of ZrCl4/L.</td>
<td>The 96h LC50 value of zirconium tetrachloride to Oncorhynchus mykiss was greater than 51 mg ZrCl4/L and the 96 h LL50 of zirconium tetrachloride to Danio rerio was greater than 190 mg of ZrCl4/L</td>
<td>-</td>
<td>The 48 h EC50 of zirconium tetrachloride to Daphnia magna was greater than 190 mg of ZrCl4/L.</td>
</tr>
</tbody>
</table>

B Persistence and degradability

C Bioaccumulation

D Mobility

E Other adverse effects

Section 13: DISPOSAL CONSIDERATIONS

A Waste from residues/unused products
Disposal should be in accordance with applicable regional, national and local laws and regulations

B Contaminated packaging
Disposal should be in accordance with applicable regional, national and local laws and regulations

Section 14: TRANSPORT INFORMATION

A UN/ID No.
2503

B Proper shipping name
Zirconium Tetrachloride

C Hazard Class
8

D Packing Group
III

E Marine pollutant
Not regulated Special IB8, IP3, T1, TP33
### Section 15: REGULATORY INFORMATION

#### A Industrial Safety and Health Law
Not applicable

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ISHA - Harmful Substances Prohibited for Manufacturing, Importing, Transferring, or Supplying</th>
<th>Korea. Harmful Substances Requiring Permission</th>
<th>ISHA - Substances to be controlled - Organic Substances</th>
<th>ISHA - Substances to be controlled - Metals</th>
<th>ISHA - Substances to be controlled - Acids and bases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zirconium Tetrachloride</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

#### B Toxic Chemicals Control Law
Not applicable

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Toxic Chemical Classification Listing (TCCL) - Toxic Chemicals</th>
<th>Toxic Chemicals Control Law - Banned and/or restricted</th>
<th>Toxic Chemicals Control Law - Restrictions on use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zirconium Tetrachloride</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

#### C Dangerous Material Safety Control
Not applicable

#### D Wastes Management
Dispose of in accordance with federal, state and local regulations

#### E Other Regulations

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Toxic Release Inventory Chemicals - Group 1</th>
<th>Toxic Release Inventory Chemicals - Group 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zirconium Tetrachloride</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

### International Inventories

- TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
- DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
- EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
- ENCS - Japan Existing and New Chemical Substances
- IECSC - China Inventory of Existing Chemical Substances
- KECL - Korean Existing and Evaluated Chemical Substances
- PICCS - Philippines Inventory of Chemicals and Chemical Substances
- AICS - Australian Inventory of Chemical Substances

### Section 16: OTHER INFORMATION

#### A Prepared By

#### B Issue Date
08-Jul-2015

#### C Revision Date
28-Dec-2017

#### Version
4

#### Revision Note
SDS sections updated: 2, 4, 5, 6, 7, 8, 9, 10, 11, 16

#### D Other Information
Note:
The information provided in this safety data sheet is correct to the best of our knowledge, information and belief at the
date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage,
transportation, disposal and release and is not to be considered a warranty or quality specification. The information
relates only to the specific material designated and may not be valid for such material used in combination with any other
materials or in any process, unless specified in the text.

End of Safety Data Sheet

Additional information available from:

Safety data sheets and labels available at ATImetals.com