Section 1: PRODUCT AND COMPANY IDENTIFICATION

Product identifier
Product Name Zirconium Tetrachloride
Product Code SAC022

Other means of identification
UN/ID No. 2503
Synonyms Zirconium Tetrachloride: Zirconium Chloride (Product #305)

Registration Number(s)

Recommended use of the chemical and restrictions on use
Recommended Use Zirconium Compounds
Uses advised against

Details of the supplier of the safety data sheet
Manufacturer ATI, 1000 Six PPG Place, Pittsburgh, PA 15222 USA
Emergency telephone number Chemtrec +1 703-741-5970

Section 2: HAZARDS IDENTIFICATION

Classification of the substance or mixture

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

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
Precautionary Statements - Response
• 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
IF ON SKIN (or hair) • Brush off loose particles from skin. Remove/ Take off immediately all contaminated clothing. Rinse skin with water/shower.
• IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
• IF SWALLOWED: Rinse mouth. DO NOT induce vomiting
• Wash contaminated clothing before reuse
• Absorb spillage to prevent material damage

Precautionary Statements - Storage
• Store in a dry place
• Store in corrosion-resistant container

Precautionary Statements - Disposal
• Dispose of contents/container to an approved waste disposal plant

Other Information
Hazards not otherwise classified (HNOC)
• Not applicable

Section 3: COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms
Zirconium Tetrachloride: Zirconium Chloride (Product #305)

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Weight-%</th>
<th>ENCS</th>
<th>ISHL No.</th>
<th>CAS No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zirconium Tetrachloride</td>
<td>&gt;97</td>
<td>X</td>
<td>-</td>
<td>10026-11-6</td>
</tr>
<tr>
<td>10026-11-6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Poisonous and Deleterious Substances Control Law</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zirconium Tetrachloride</td>
<td>-</td>
</tr>
<tr>
<td>10026-11-6</td>
<td></td>
</tr>
</tbody>
</table>

Section 4: FIRST AID MEASURES

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.

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

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

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

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

Inhalation
Product not classified.

Skin Contact
Causes severe skin burns.

Eye contact
Causes severe eye damage.

Ingestion
Product not classified.

Note to physicians
Treat symptomatically.

Section 5: FIRE FIGHTING MEASURES

Flammable properties
Non-combustible.
Explosive properties  
Not applicable.

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.

Specific hazards arising from the chemical  
Non-combustible.

Hazardous combustion products  
Not applicable.

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

Section 6: ACCIDENTAL RELEASE MEASURES

Personal precautions  
Use personal protective equipment as required.

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

Environmental precautions  
Collect spillage to prevent release to the environment.

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

Handling
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.

Storage
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

Exposure Guidelines  
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>Japan</th>
<th>ISHL Working Environmental Evaluation Standards - Administrative Control Levels</th>
<th>ACGIH TLV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zirconium Tetrachloride</td>
<td>-</td>
<td>-</td>
<td>STEL: 10 mg/m³ Zr TWA: 5 mg/m³ Zr</td>
</tr>
</tbody>
</table>

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

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

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Remarks • Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>&lt;1</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>440 °C / 820 °F</td>
<td></td>
</tr>
<tr>
<td>Boiling point / boiling range</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Flash point</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>-</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>-</td>
<td>Not flammable</td>
</tr>
<tr>
<td>Flammability Limit in Air</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Upper flammability limit:</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Lower flammability limit:</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>-</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Vapor density</td>
<td>-</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>2.8</td>
<td></td>
</tr>
<tr>
<td>Water solubility</td>
<td>Reacts with water</td>
<td>hydrolyzes</td>
</tr>
<tr>
<td>Solubility(ies)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Partition coefficient</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Autoignition temperature</td>
<td>-</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>-</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Kinematic viscosity</td>
<td>-</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Dynamic viscosity</td>
<td>-</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td>Softening point</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Molecular weight</td>
<td>233.04</td>
<td></td>
</tr>
<tr>
<td>VOC Content (%)</td>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td>Density</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Bulk density</td>
<td>45-80 lb/ft3</td>
<td></td>
</tr>
</tbody>
</table>

Section 10: STABILITY AND REACTIVITY

Reactivity
Reacts with water

Stability
Stable under normal conditions.

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

Possibility of Hazardous Reactions
Reacts with water
Hazardous polymerization: Hazardous polymerization does not occur.

Conditions to avoid: Unintentional contact with water.

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

Hazardous Decomposition Products: Reacts with water to produce hydrogen chloride gas or hydrochloric acid and heat.

Section 11: TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

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

Chemical Name | Oral LD50 | Dermal LD50 | Inhalation LC50
---|---|---|---
Zirconium Tetrachloride | - | - | -
10026-11-6 | - | - | -

Information on toxicological effects

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

Acute toxicity

Numerical measures of toxicity -

Numerical measures of toxicity - Component Information

Chemical Name | Oral LD50 | Dermal LD50 | Inhalation LC50
---|---|---|---
Zirconium Tetrachloride | - | - | -
10026-11-6 | - | - | -

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.
- Germ cell mutagenicity: Product not classified.
- Carcinogenicity: Product not classified.

Chemical Name | Japan | IARC
---|---|---
Zirconium Tetrachloride | Japan | -
10026-11-6 | 10026-11-6 | -

Reproductive toxicity: Product not classified.

STOT - single exposure: Product not classified.
Section 12: ECOLOGICAL INFORMATION

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>

Persistence and degradability

Bioaccumulation

Mobility

Other adverse effects

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>EU - Endocrine Disrupters Candidate List</th>
<th>EU - Endocrine Disruptors - Evaluated Substances</th>
<th>Endocrine disrupting potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zirconium Tetrachloride</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Section 13: DISPOSAL CONSIDERATIONS

Waste from residues/unused products

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated packaging

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Section 14: TRANSPORT INFORMATION

UN Number 2503
Packing Group III
Proper shipping name Zirconium Tetrachloride
Hazard Class 8
Special Provisions IB8, IP3, T1, TP33

IMDG
Proper shipping name Zirconium Tetrachloride
Hazard Class 8
UN/ID No. 2503
Section 15: REGULATORY INFORMATION

International Inventories

<table>
<thead>
<tr>
<th>Inventory</th>
<th>Complies</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSCA</td>
<td></td>
</tr>
<tr>
<td>DSL/NDSL</td>
<td></td>
</tr>
<tr>
<td>EINECS/ELINCS</td>
<td></td>
</tr>
<tr>
<td>ENCS</td>
<td></td>
</tr>
<tr>
<td>IECSC</td>
<td></td>
</tr>
<tr>
<td>KECL</td>
<td></td>
</tr>
<tr>
<td>PICCS</td>
<td></td>
</tr>
<tr>
<td>AICS</td>
<td></td>
</tr>
</tbody>
</table>

**Legend:**

- **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

### Dangerous Substances

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Dangerous Substances</th>
<th>organic solvents</th>
<th>Harmful Substances Whose Names Are to be Indicated on the Label</th>
<th>ISHL - Prevention of Hazards Due to Specified Chemical Substances (Class 2)</th>
<th>Prevention of Lead Poisoning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zirconium Tetrachloride 10026-11-6</td>
<td>&gt;1 %</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
Chemical Name | Class 2 | Class 1 | Poisonous and Deleterious Substances Control Law | Fire Service Law:
--- | --- | --- | --- | ---
Zirconium Tetrachloride 10026-11-6 | Not applicable | - | Not applicable | -

### Section 16: OTHER INFORMATION

**Prepared By**

**Issue Date** 08-Jul-2015

**Revision Date** 28-Dec-2017

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

**Key or legend to abbreviations and acronyms used in the safety data sheet**

**Note:**
This SDS complies with the requirements of JIS Z 7250:2010 and JIS Z 7252:2009 (Japan). 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