Section 1: PRODUCT AND COMPANY IDENTIFICATION

Product identifier
Product Name: Zirconium Oxynitrate
Product Code: SAC037

Other means of identification
UN/ID No.: 3085
Synonyms: Zirconium Oxynitrate: Zirconium Dinitrate Oxide, Zirconium Dinitrate Dihydroxide, Zirconium Nitrate Hydroxide, Zirconyl Nitrate (Product #316)

CAS No.: 13826-66-9
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
Emergency Telephone: Chemtrec +1 703-741-5970

Section 2: HAZARDS IDENTIFICATION

Classification of the substance or mixture

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category 2</td>
<td>Oxidizing solids</td>
</tr>
<tr>
<td>Category 4</td>
<td>Acute toxicity - Oral</td>
</tr>
<tr>
<td>Category 1</td>
<td>Skin corrosion/irritation</td>
</tr>
<tr>
<td>Sub-category B</td>
<td>Serious eye damage/eye irritation</td>
</tr>
</tbody>
</table>

Label elements

Emergency Overview

Signal word: Danger

Hazard statements
H272 - May intensify fire; oxidizer
H314 - Causes severe skin burns and eye damage
H318 - Causes serious eye damage
H302 - Harmful if swallowed
Precautionary Statements - Prevention

• Wear protective gloves/protective clothing/eye protection
• Do not breathe dust/gas/mist
• Do not eat, drink or smoke when using this product
• Wash hands thoroughly after handling
• Keep away from heat/sparks/open flames/hot surfaces. - No smoking
• Store away from flammable substances, reducing agents, metal powders, and organic materials.

Precautionary Statements - Response

• IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
• IF ON SKIN (or hair): • Brush off loose particles from skin. Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower
• Wash contaminated clothing before reuse
• 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. • Immediately call a POISON CENTER or doctor/physician
• In case of fire: Use Water spray, fog or regular foam for extinction

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 Oxynitrate: Zirconium Dinitrate Oxide, Zirconium Dinitrate Dihydroxide, Zirconium Nitrate Hydroxide, Zirconyl Nitrate (Product #316)

CAS No.
13826-66-9

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Weight-%</th>
<th>ENCS</th>
<th>ISHL No.</th>
<th>CAS No.</th>
</tr>
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<tbody>
<tr>
<td>Zirconium Dinitrate Oxide</td>
<td>&gt;99</td>
<td>X</td>
<td>-</td>
<td>13826-66-9</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Poisonous and Deleterious Substances Control Law</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zirconium Dinitrate Oxide</td>
<td>Class 1</td>
</tr>
<tr>
<td>13826-66-9</td>
<td></td>
</tr>
</tbody>
</table>

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Japan; English
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
Harmful if swallowed.

Note to physicians
Treat symptomatically.

Section 5: FIRE FIGHTING MEASURES

Flammable properties
Not flammable.

Explosive properties
Not applicable.

Suitable extinguishing media
Material is a strong oxidizer but is itself not flammable. Water spray or fog is preferred; if water not available use dry chemical, CO2 or regular foam.

Unsuitable extinguishing media
None.

Specific hazards arising from the chemical
This is a strong oxidizer and will react vigorously or explosively with many materials including organic materials, such as wood and paper, and flammable metals.

Hazardous combustion products
Nitrogen oxide gases may cause respiratory and/or eye irritation.

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. 140.

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 away from heat, sparks, flame and other sources of ignition (i.e., pilot lights, electric motors and static electricity). Store away from flammable substances, reducing agents, metal powders, and organic materials. 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

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 Dinitrate Oxide</td>
<td>-</td>
<td>-</td>
<td>STEL: 10 mg/m³ Zr</td>
</tr>
<tr>
<td>13826-66-9</td>
<td></td>
<td></td>
<td>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>Physical state</th>
<th>Solid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Powder</td>
</tr>
<tr>
<td>Color</td>
<td>white</td>
</tr>
<tr>
<td>Odor Pungent</td>
<td>Slight nitric</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>-</td>
</tr>
</tbody>
</table>

<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>-</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Boiling point / boiling range</td>
<td>-</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Flash point</td>
<td>-</td>
<td>Not applicable</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>
</tbody>
</table>
### Explosive properties
Not applicable

### Oxidizing properties
Strong oxidizer and will react vigorously or explosively with many materials including organic materials, such as wood and paper, and flammable metals.

### Softening point
- 

### Molecular weight
- 

### VOC Content (%)
Not applicable

### Density
- 

### Bulk density
48 lb/ft³

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**Section 10: STABILITY AND REACTIVITY**

**Reactivity**
Reacts with water. Strong oxidizer and will react vigorously or explosively with many materials including organic materials, such as wood and paper, and flammable metals.

**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. Heat. Electrostatic discharge.

**Incompatible materials**

**Hazardous Decomposition Products**
Reacts with water to produce nitric 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**

Harmful if swallowed.

<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 Dinitrate Oxide</td>
<td>&gt; 300 and &lt; 2000 mg/kg bw</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Information on toxicological effects**

**Symptoms**

May cause skin burns. May cause burning sensation or redness in the eyes. May cause acute gastrointestinal effects if swallowed. May cause severe upper respiratory irritation if inhaled.

**Acute toxicity**

**Numerical measures of toxicity - Product Information**

**Numerical measures of toxicity - Component Information**

<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 Dinitrate Oxide</td>
<td>&gt; 300 and &lt; 2000 mg/kg bw</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**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.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Japan</th>
<th>IARC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zirconium Dinitrate Oxide</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>13826-66-9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Reproductive toxicity**

Product not classified.

**STOT - single exposure**

Product not classified.

**STOT - repeated exposure**

Product not classified.

**Target Organ Effects**

.

**Aspiration hazard**

Product not classified.

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**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 Dinitrate Oxide</td>
<td>The 72 h EC50 of zirconium dichloride</td>
<td>The 96 h LL50 of zirconium dinitrate</td>
<td>-</td>
<td>The 48 h EC50 of zirconium dioxide</td>
</tr>
</tbody>
</table>
oxide to *Pseudokirchnerella subcapitata* was 80% v/v saturated solution. oxide to *Oncorhynchus mykiss* was greater than 100 mg/L. *Daphnia magna* was greater than 100 mg/L.

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 Dinitrate Oxide</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**

| 3085 |

**Packing Group**

| II |

**Proper shipping name**

Oxidizing Solid, Corrosive, n.o.s. (Zirconium Oxynitrate)

**Hazard Class**

5.1/8

**Special Provisions**

62, IB8, IP3, T1, TP33

**IMDG**

**Proper shipping name**

Oxidizing Solid, Corrosive, n.o.s. (Zirconium Oxynitrate)

**Hazard Class**

5.1

**Subsidiary hazard class**

8

**UN/ID No.**

3085

**Packing Group**

II

**Special Provisions**

62, IB8, IP3, T1, TP33

**ICAO (air)**

**UN/ID No.**

3085

**Proper shipping name**

Oxidizing Solid, Corrosive, n.o.s. (Zirconium Oxynitrate)

**Hazard Class**

5.1

**Subsidiary hazard class**

8

**Packing Group**

II

**Special Provisions**

128, IB8, IP3, T1, TP33

**ADR**

**UN/ID No.**

3085

**Proper shipping name**

Oxidizing Solid, Corrosive, n.o.s. (Zirconium Oxynitrate)

**Hazard Class**

5.1/8

**Packing Group**

II

**ERG Code**

140

**Special Provisions**

62, IB8, IP3, T1, TP33

**IATA**

**UN/ID No.**

3085

**Proper shipping name**

Oxidizing Solid, Corrosive, n.o.s. (Zirconium Oxynitrate)
Section 15: REGULATORY INFORMATION

International Inventories

DSL/NDSL: Complies
EINECS/ELINCS: Complies
ENCS: Complies
IECSC: Complies
KECL: Complies
PICCS: Not Listed
AICS: Not Listed

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

<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 Dinitrate Oxide</td>
<td>X</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>13826-66-9</td>
<td>&gt;1 %</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Class 2</th>
<th>Class 1</th>
<th>Poisonous and Deleterious Substances Control Law</th>
<th>Fire Service Law:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zirconium Dinitrate Oxide</td>
<td>Not applicable</td>
<td>-</td>
<td>Not applicable</td>
<td>1</td>
</tr>
<tr>
<td>13826-66-9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Section 16: OTHER INFORMATION

Issue Date: 25-Jan-2017
Revision Date: 20-Mar-2018
Revision Note: Updated Section(s): 1, 2, 5, 6, 7, 8, 9, 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.

Additional information available from:

Safety data sheets and labels available at ATImetals.com

End of Safety Data Sheet