

- 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

C Other Information**Hazards not otherwise classified (HNOC)**

- Not applicable

Section 3: COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms Zirconium Tetrachloride: Zirconium Chloride, (Product #305).

Chemical Name	CAS No.	Weight-%
Zirconium Tetrachloride	10026-11-6	>97

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

Chemical Name	Korea
Zirconium Tetrachloride	STEL: 10 mg/m ³ TWA: 5 mg/m ³

- 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**

<u>Property</u>	<u>Values</u>	<u>Remarks • Method</u>
D pH	<1	
E Melting point/freezing point	440 °C / 820 °F	
F Boiling point / boiling range	-	
G Flash point	-	Not applicable
H Evaporation rate	-	Not applicable
I Flammability (solid, gas)	-	Not flammable
J Flammability Limit in Air		
Upper flammability limit:		-
Lower flammability limit:		-
K Vapor pressure	-	Not applicable
L Solubility(ies)		
Water solubility	Reacts with water	hydrolyzes
Solubility in other solvents		
M Vapor density	-	Not applicable
N Specific Gravity	2.8	
O. Partition coefficient	-	
P. Autoignition temperature	-	Not applicable
Q. Decomposition temperature	-	Not applicable
R Kinematic viscosity	-	Not applicable
Dynamic viscosity	-	Not applicable
S. Molecular weight	233.04	
<u>Other Information</u>		
Explosive properties	Not applicable	
Oxidizing properties	Not applicable	
Softening point	-	
VOC Content (%)	Not applicable	
Density	-	
Bulk density	45-80 lb/ft3	

Section 10: STABILITY AND REACTIVITY

A Stability	Stable under normal conditions
<u>Explosion data</u>	
Sensitivity to Mechanical Impact	None.
Sensitivity to Static Discharge	None.
B Possibility of Hazardous Reactions	Reacts with water
Hazardous polymerization	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

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Zirconium Tetrachloride	-	-	-

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.

Chemical Name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
Zirconium Tetrachloride	<i>The 14 d NOEC of zirconium tetrachloride to Chlorella vulgaris was greater than 262 mg of ZrCl₄/L.</i>	<i>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.</i>	-	<i>The 48 h EC50 of zirconium tetrachloride to Daphnia magna was greater than 190 mg of ZrCl₄/L.</i>

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

Provisions

Section 15: REGULATORY INFORMATION

A Industrial Safety and Health Law Not applicable

Chemical Name	ISHA - Harmful Substances Prohibited for Manufacturing, Importing, Transferring, or Supplying	Korea. Harmful Substances Requiring Permission	ISHA - Substances to be controlled - Organic Substances	ISHA - Substances to be controlled - Metals	ISHA - Substances to be controlled - Acids and bases
Zirconium Tetrachloride	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable

B Toxic Chemicals Control Law Not applicable

Chemical Name	Toxic Chemical Classification Listing (TCCL) - Toxic Chemicals	Toxic Chemicals Control Law - Banned and/or restricted	Toxic Chemicals Control Law - Restrictions on use
Zirconium Tetrachloride	Not applicable	Not applicable	Not applicable

C Dangerous Material Safety Control Not applicable

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

E Other Regulations

Chemical Name	Toxic Release Inventory Chemicals - Group 1	Toxic Release Inventory Chemicals - Group 2
Zirconium Tetrachloride	Not applicable	Not applicable

International Inventories

TSCA	Complies
DSL/NDSL	Complies
EINECS/ELINCS	Complies
ENCS	Complies
IECSC	Complies
KECL	Complies
PICCS	Complies
AICS	Complies

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

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