



SAFETY DATA SHEET

Issue Date 28-May-2015

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Version 4

Section 1: PRODUCT AND COMPANY IDENTIFICATION

- A Product Name** Zirconium Oxide
- Synonyms** All anhydrous Zirconium Dioxide products, All grades of zirconium oxide, including spectrographic grade, jet milled, reactor grade (Product #304)
- Product Code** SAC018
- B Recommended Use** Chemical intermediate
- Uses advised against**
- C Supplier**
- Manufacturer**
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Section 2: HAZARDS IDENTIFICATION

A GHS - Classification

Not a hazardous substance or mixture according to the Globally Harmonized System (GHS)

B Label elements

Emergency Overview		
Appearance Powder	Physical state Solid	Odor Odorless

C Other Information

Hazards not otherwise classified (HNOC)

- Not applicable

Section 3: COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms All anhydrous Zirconium Dioxide products, All grades of zirconium oxide, including spectrographic grade, jet milled, reactor grade (Product #304).

Chemical Name	CAS No.	Weight-%
Zirconium Dioxide	1314-23-4	>99

Section 4: FIRST AID MEASURES

- A Eye contact** In the case of particles coming in contact with eyes during processing, treat as with any foreign object
- B Skin Contact** None under normal use conditions
- C Inhalation** If excessive amounts of smoke, fume, or particulate are inhaled during processing, remove

to fresh air and consult a qualified health professional

D Ingestion IF SWALLOWED Call a POISON CENTER or doctor/physician if you feel unwell

E Symptoms None anticipated.

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** Non-combustible
- 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.
- 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

Section 7: HANDLING AND STORAGE

- A Advice on safe handling** Handle in accordance with good industrial hygiene and safety practice
- B Storage Conditions** Keep in properly labeled containers
- Incompatible materials** None known

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 Dioxide	STEL: 10 mg/m ³ TWA: 5 mg/m ³

- B Engineering Controls** Avoid generation of uncontrolled particles
- 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	When airborne particles may be present, appropriate eye protection is recommended. For example, tight-fitting goggles, foam-lined safety glasses or other protective equipment that shield the eyes from particles.
Skin and body protection	Wear protective gloves
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	Color	white
Appearance	Powder		
B Odor	Odorless		
C Odor threshold	Not applicable		

<u>Property</u>	<u>Values</u>	<u>Remarks • Method</u>
D pH	-	
E Melting point/freezing point	2710 °C / 4910 °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	Insoluble	
Solubility in other solvents		
M Vapor density	-	Not applicable
N Specific Gravity	5.6	
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	-	

Other Information

Explosive properties	Not applicable
Oxidizing properties	Not applicable
Softening point	-
VOC Content (%)	Not applicable
Density	-
Bulk density	110-130 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	None under normal processing
Hazardous polymerization	Hazardous polymerization does not occur
C Conditions to avoid	Dust formation and dust accumulation
D Incompatible materials	None known
E Hazardous Decomposition Products	None known

Section 11: TOXICOLOGICAL INFORMATION

A Information on likely routes of exposure

Inhalation	Product not classified.
Ingestion	Product not classified.
Eye contact	Product not classified.
Skin Contact	Product not classified.

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

Skin corrosion/irritation	Product not classified.
Serious eye damage/eye irritation	Product not classified.
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	
Aspiration hazard	Product not classified.

C Numerical measures of toxicity

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Zirconium Dioxide	>5000 mg/kg bw	-	>4.3 mg/L

Information on toxicological effects

Symptoms None known.

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 Dioxide	<i>The 15 d NOEC of zirconium dichloride oxide to Chlorella vulgaris was greater than 200 mg/L</i>	<i>The 96 h LL50 of zirconium dioxide to Danio rerio was greater than 100 mg/L.</i>		<i>The 48 h EC50 of zirconium dioxide to Daphnia magna was greater than 100 mg/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.	Not regulated
B Proper shipping name	Not regulated
C Hazard Class	Not regulated
D Packing Group	Not regulated
E Marine pollutant	Not regulated

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 Dioxide	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 Dioxide	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 Dioxide	Not applicable	Not applicable

International Inventories

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 28-May-2015

C Revision Date 17-Mar-2017
Version 4

Revision Note

Updated Section(s): 4, 6

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