SAFETY DATA SHEET

Issue Date 08-Jul-2015 **Revision Date** 14-Mar-2019 **Version** 4

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product identifier
Product Name Magnesium Chloride Anhydrous Flakes (from Zirconium Production)

Other means of identification
Product Code SAC019
UN/ID No. 2813
Synonyms Kroll reduction salt flakes from Zirconium production (Product #106)

Recommended use of the chemical and restrictions on use
Recommended Use Chemical intermediate.
Uses advised against

Details of the supplier of the safety data sheet
Manufacturer Address
ATI, 1000 Six PPG Place, Pittsburgh, PA
15222 USA
Emergency telephone number
Emergency Telephone Chemtrec: 1-800-424-9300

2. HAZARDS IDENTIFICATION

Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Substances or mixtures which, in contact with water, emit flammable gases	Category 3

Label elements

Emergency Overview

Warning

Hazard statements
In contact with water releases flammable gases

Appearance Flakes, Chunks, Powder **Physical state** Solid **Odor** Odorless

Precautionary Statements - Prevention
Do not breathe resulting gases
Wear protective gloves/protective clothing/eye protection
Protect from moisture

Precautionary Statements - Response

In case of fire: Use salt (NaCl) or class D dry powder for extinction

Precautionary Statements - Storage
Store in a dry place

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

Hazards not otherwise classified (HNOC)
Not applicable

Other Information
If this magnesium chloride salt is dissolved in water, handle the insoluble residue as a pyrophoric material, which is especially hazardous when moist, i.e. 5-20% water. Moist residue can ignite with explosive force. Do not accumulate any quantity of this residue.
When mixed with water, heat, steam, and possibly hydrogen and hydrogen sulfide gas may be generated. Do not mix magnesium chloride with water except in a well-ventilated area, under conditions where heat and any gas that may evolve can easily dissipate.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms Kroll reduction salt flakes from Zirconium production, (Product #106).

Chemical Name	CAS No.	Weight-%
Magnesium Chloride	7786-30-3	94- >99
Magnesium Oxide	1309-48-4	0-5
Water	7732-18-5	0-1
Magnesium	7439-95-4	0-0.3
Zirconium	7440-67-7	0.1

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4. FIRST AID MEASURES

First aid measures

Eye contact In case of contact with eyes, rinse immediately. If eye irritation persists, get medical advice/attention.

Skin Contact Wash off immediately with soap and plenty of water.

Inhalation If fumes from reactions are inhaled, move to fresh air immediately.

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

Most important symptoms and effects, both acute and delayed

Symptoms None anticipated.

Indication of any immediate medical attention and special treatment needed

Note to physicians Treat symptomatically.

5. FIRE-FIGHTING MEASURES

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.

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

Protective equipment and precautions for firefighters
Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions Use personal protective equipment as required.

For emergency responders Use personal protective equipment as required. Follow Emergency Response Guidebook, Guide No. 138.

Environmental precautions

Environmental precautions Collect spillage to prevent release to the environment.

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 - remaining magnesium chloride residue would cause the floor to become slippery.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling If this magnesium chloride salt is dissolved in water, handle the insoluble residue as a pyrophoric material, which is especially hazardous when moist, i.e. 5-20% water. Moist residue can ignite with explosive force. Do not accumulate any quantity of this residue. When mixed with water, heat, steam, and possibly hydrogen and hydrogen sulfide gas may be generated. Do not mix magnesium chloride with water except in a well-ventilated area, under conditions where heat and any gas that may evolve can easily dissipate.

Conditions for safe storage, including any incompatibilities

Storage Conditions Magnesium chloride solutions in uncoated steel tanks may activate the metal surface so that when the tanks are drained the surfaces rust quickly consuming available oxygen. Use safe tank entry procedures with good ventilation and oxygen level monitoring.

Incompatible materials Water.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines

Chemical Name	ACGIH TLV	OSHA PEL
Magnesium Chloride 7786-30-3	-	-
Magnesium Oxide	TWA: 10 mg/m^3 inhalable fraction	TWA: 15 mg/m^3 fume, total particulate

1309-48-4		
Water 7732-18-5	-	-
Magnesium 7439-95-4	-	-
Zirconium 7440-67-7	STEL: 10 mg/m³ STEL: 10 mg/m³ Zr TWA: 5 mg/m³ TWA: 5 mg/m³ Zr	TWA: 5 mg/m³ Zr (vacated) STEL: 10 mg/m³ (vacated) STEL: 10 mg/m³ Zr

Appropriate engineering controls

Engineering Controls Avoid generation of uncontrolled particles.

Individual protection measures, such as personal protective equipment

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.

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.

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

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state	Solid		
Appearance	Flakes, Chunks, Powder	**Odor**	Odorless
Color	Grey silver	**Odor threshold**	Not applicable

Property	**Values**	**Remarks • Method**
pH	-	Not applicable
Melting point/freezing point	710 °C / 1310 °F	
Boiling point / boiling range	-	
Flash point	-	Not applicable
Evaporation rate	-	Not applicable
Flammability (solid, gas)	-	Not flammable
Flammability Limit in Air		
Upper flammability limit:	-	
Lower flammability limit:	-	
Vapor pressure	-	Not applicable
Vapor density	-	Not applicable
Specific Gravity	2.3	
Water solubility		
Solubility in other solvents	-	
Partition coefficient	-	Not applicable
Autoignition temperature	-	Not applicable
Decomposition temperature	-	
Kinematic viscosity	-	Not applicable
Dynamic viscosity	-	Not applicable
Explosive properties	Not applicable	
Oxidizing properties	Not applicable	

Other Information

Softening point	-
Molecular weight	-
VOC Content (%)	Not applicable
Density	-
Bulk density	100-110 lb/ft3

10. STABILITY AND REACTIVITY

Reactivity
Reacts with water

Chemical stability
Stable under normal conditions.

Possibility of Hazardous Reactions
Reacts with water.

Hazardous polymerization Hazardous polymerization does not occur.

Conditions to avoid
Unintentional contact with water. When mixed with water, heat, steam, and possibly hydrogen and hydrogen sulfide gas may be generated. Do not mix magnesium chloride with water except in a well-ventilated area, under conditions where heat and any gas that may evolve can easily dissipate.

Incompatible materials
Water.

Hazardous Decomposition Products
None while dry and cool. Magnesium chloride heated above 110°C in the presence of moisture will evolve hydrogen chloride fumes.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Inhalation Product not classified.

Eye contact Product not classified.

Skin Contact Product not classified.

Ingestion Product not classified.

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Magnesium Chloride 7786-30-3	5000 mg/kg bw	>2000 mg/kg bw	-
Magnesium Oxide 1309-48-4	-	-	-
Water 7732-18-5	-	-	-
Magnesium 7439-95-4	>2000 mg/kg bw	-	-
Zirconium 7440-67-7	> 5000 mg/kg bw	-	>4.3 mg/L

Information on toxicological effects

Symptoms None known.

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

Acute toxicity	Product not classified.
Skin corrosion/irritation	Product not classified.
Serious eye damage/eye irritation	Product not classified.
Sensitization	Product not classified.
Germ cell mutagenicity	Product not classified.
Carcinogenicity	Product not classified.
Reproductive toxicity	Product not classified.
STOT - single exposure	Product not classified.
STOT - repeated exposure	Product not classified.
Aspiration hazard	Product not classified.

12. ECOLOGICAL INFORMATION

Ecotoxicity

This product as shipped is not classified for aquatic toxicity.

Chemical Name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
Magnesium Chloride 7786-30-3	The 72 h EC50 of magnesium chloride to Desmodesmus subspicatus was greater than 100 mg of MgCl2/L.	The 96 h LC50 of magnesium chloride to Pimephales promelas was 2119.3 mg of MgCl2/L.	The 3 h EC50 of magnesium chloride for activated sludge was greater than 900 mg of MgCl2/L.	The 48 h LC50 of magnesium chloride hexahydrate to Daphnia magna was 548.4 mg of MgCl2/L.
Magnesium Oxide 1309-48-4	-	-	-	-
Water 7732-18-5	-	-	-	-
Magnesium 7439-95-4	The 72 h EC50 of magnesium chloride hexahydrate to Desmodesmus subspicatus was greater than 12 mg of Mg/L.	The 96 h LC50 of magnesium chloride to Pimephales promelas was 541 mg of Mg/L.	The 3 h EC50 of magnesium chloride hexahydrate for activated sludge was greater than 108 mg of Mg/L.	The 48 h LC50 of magnesium chloride to Ceriodaphnia dubia was 225 mg of Mg/L. The 48 h LC50 of magnesium chloride hexahydrate to Daphnia magna was 322 mg of Mg/L.
Zirconium 7440-67-7	The 14 d NOEC of zirconium dichloride oxide to Chlorella vulgaris was greater than 102.5 mg of Zr/L.	The 96 h LL50 of zirconium to Danio rerio was greater than 74.03 mg/L.	-	The 48 h EC50 of zirconium dioxide to Daphnia magna was greater than 74.03 mg of Zr/L.

Persistence and degradability

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Other adverse effects

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Disposal of wastes

Disposal should be in accordance with applicable regional, national and local laws and regulations. Note that USEPA may consider waste magnesium chloride anhydrous to exhibit the hazardous characteristic of reactivity (D003). If this magnesium chloride salt is dissolved in water, handle the insoluble residue as a pyrophoric material, which is especially hazardous when moist, i.e. 5-20% water. Moist residue can ignite with explosive force. Do not accumulate any quantity of this residue. Dispose of residue, which may exhibit the hazardous characteristic of ignitability (D001) and/or reactivity (D003), per Federal,

State, and Local requirements.

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

This product contains one or more substances that are listed with the State of California as a hazardous waste.

14. TRANSPORT INFORMATION

DOT Regulated

UN/ID No.	2813
Proper shipping name	Water Reactive Solid, n.o.s., (Magnesium Chloride)
Hazard Class	4.3
Packing Group	III
Special Provisions	IB8, IP4, T1, TP33
Emergency Response Guide Number	138

15. REGULATORY INFORMATION

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

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

SARA 311/312 Hazard Categories

Acute health hazard	No
Chronic Health Hazard	No
Fire hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	Yes

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

CERCLA
This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

US State Regulations

California Proposition 65
This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Magnesium Oxide 1309-48-4	X	X	X
Water 7732-18-5			X
Magnesium 7439-95-4	X	X	X
Zirconium 7440-67-7	X	X	X

U.S. EPA Label Information
EPA Pesticide Registration Number Not applicable

16. OTHER INFORMATION

NFPA	**Health hazards** 0	**Flammability** 0	**Instability** 1	**Physical and Chemical Properties** -
HMIS	**Health hazards** 1*	**Flammability** 0	**Physical hazards** 1	**Personal protection** X

Chronic Hazard Star Legend ** = Chronic Health Hazard*

Issue Date 08-Jul-2015
Revision Date 14-Mar-2019
Revision Note
Updated Section(s) 1, 2, 3, 4, 5, 6, 9, 10, 11, 13
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