SAFETY DATA SHEET

Issue Date 25-Mar-2020 **Revision Date** 25-Mar-2020 **Version** 1

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

Product identifier
Product Name Niobium Thermite Mixture

Other means of identification
Product Code SAC021
UN/ID No. 3132
Synonyms Niobium Thermite Mixture

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

Acute toxicity - Oral	Category 4
Acute toxicity - Inhalation (Dusts/Mists)	Category 4
Oxidizing solids	Category 2
Flammable solids	Category 1
Substances or mixtures which, in contact with water, emit flammable gases	Category 2

Label elements

Emergency Overview

Danger

Hazard statements
Harmful if swallowed
Harmful if inhaled
May intensify fire; oxidizer
Flammable solid
In contact with water releases flammable gases

Appearance Powder	**Physical state** Solid	**Odor** Odorless

Precautionary Statements - Prevention
Wear protective gloves/protective clothing/eye protection/face protection
Keep away from heat/sparks/open flames/hot surfaces. - No smoking
Wash hands thoroughly after handling
Do not eat, drink or smoke when using this product
Avoid breathing dust/fume
Use only outdoors or in a well-ventilated area
Keep/Store away from combustible materials
Keep away from any possible contact with water, because of violent reaction and possible flash fire
Ground/bond container and receiving equipment
If dust clouds can occur, use explosion-proof electrical/ ventilating/lighting/equipment
Protect from moisture

Precautionary Statements - Response
IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell
Rinse mouth
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
IF INHALED: Call a POISON CENTER or doctor if you feel unwell
IF ON SKIN (or hair): Brush off loose particles from skin: Rinse skin with water/shower
In case of fire: Isolate fire and allow to burn out

Precautionary Statements - Storage
Store in a dry place. Store in a closed container

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

Hazards not otherwise classified (HNOC)
Not applicable
Other Information
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3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms Niobium Thermite Mixture.

Chemical Name	CAS No.	Weight-%
Niobium Pentoxide	1313-96-8	60
Aluminum	7429-90-5	25
Barium peroxide	1304-29-6	15

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4. FIRST AID MEASURES

First aid measures

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

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

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.

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

Most important symptoms and effects, both acute and delayed

Symptoms Contact with moist skin may cause skin burns. May cause breathing difficulties if inhaled.

Indication of any immediate medical attention and special treatment needed

Note to physicians Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media
Isolate fire and allow to burn out.

Unsuitable extinguishing media If a fire occurs in the area, avoid water contact with the product to prevent evolution of hazardous gases. Do not spray water on burning product as an explosion may occur. This explosive characteristic is caused by the hydrogen and steam generated by the reaction of water with the burning material.

Specific hazards arising from the chemical
Intense heat. Will be easily ignited by heat, sparks or flames. Burns vigorously after ignition. WARNING: Fine particles of this product may form combustible dust-air mixtures. Keep particles away from all ignition sources including heat, sparks, and flame. Prevent dust accumulations to minimize combustible dust hazard. 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 Not applicable.

Explosion data
Sensitivity to Mechanical Impact None.
Sensitivity to Static Discharge May be ignited by friction, heat, sparks or flames.

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 using non-sparking tools. 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.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling WARNING: Fine particles of this product may form combustible dust-air mixtures. Keep particles away from all ignition sources including heat, sparks, and flame. Prevent dust accumulations to minimize combustible dust hazard. 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.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep away from heat, sparks, flame and other sources of ignition (i.e., pilot lights, electric motors and static electricity). 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. Store away from flammable substances, reducing agents, metal powders, and organic materials. Keep container grounded to prevent static discharge.

Incompatible materials Dissolves in hydrofluoric acid. Flammable substances, reducing agents, metal powders, and organic materials.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines

Chemical Name	ACGIH TLV	OSHA PEL
Niobium Pentoxide 1313-96-8	-	-
Aluminum 7429-90-5	TWA: 1 mg/m^3 respirable fraction	TWA: 15 mg/m^3 total dust TWA: 5 mg/m^3 respirable fraction
Barium peroxide 1304-29-6	-	-

Appropriate engineering controls

Engineering Controls Avoid generation of uncontrolled particles.

Individual protection measures, such as personal protective equipment

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 Fire/flame resistant/retardant clothing may be appropriate during hot work with the product. Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

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	Powder	**Odor**	Odorless
Color	Grey silver	**Odor threshold**	Not applicable

Property	Values	Remarks • Method
pH	-	Not applicable
Melting point / freezing point	approx. 1852 °C	
Boiling point / boiling range	approx. 4377 °C	
Flash point	-	
Evaporation rate	-	Not applicable
Flammability (solid, gas)	-	Flammable

Flammability Limit in Air		
Upper flammability limit:	-	
Lower flammability limit:	-	
Vapor pressure	-	Not applicable
Vapor density	-	Not applicable
Specific Gravity	6.49	
Water solubility	Insoluble	
Solubility in other solvents	-	
Partition coefficient	-	Not applicable
Autoignition temperature	-	Not applicable
Decomposition temperature	-	Not applicable
Kinematic viscosity	-	Not applicable
Dynamic viscosity	-	Not applicable
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.	

Other Information

Softening point	-
Molecular weight	-
VOC Content (%)	Not applicable
Density	-
Bulk density	-

10. STABILITY AND REACTIVITY

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

Chemical stability
Stable under recommended storage conditions.

Possibility of Hazardous Reactions
None at standard temperature and pressure.

Hazardous polymerization Hazardous polymerization does not occur.

Conditions to avoid
Dust formation and dust accumulation. Heat, Electrostatic discharge.

Incompatible materials
Dissolves in hydrofluoric acid. Flammable substances, reducing agents, metal powders, and organic materials.

Hazardous Decomposition Products
Not applicable.

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 Harmful if swallowed.

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Niobium Pentoxide 1313-96-8	-	-	-
Aluminum 7429-90-5	15,900 mg/kg bw	-	> 1 mg/L
Barium peroxide 1304-29-6	-	-	-

Information on toxicological effects

Symptoms None known.

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

Acute toxicity Harmful if swallowed.
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
Niobium Pentoxide 1313-96-8	-	-	-	-
Aluminum 7429-90-5	The 96-h EC50 values for reduction of biomass of Pseudokirchneriella subcapitata in AAP-Medium at pH 6, 7, and 8 were estimated as 20.1, 5.4, and 150.6 µg/L, respectively, for dissolved Al.	The 96 h LC50 of aluminum to Oncorhynchus mykiss was 7.4 mg of Al/L at pH 6.5 and 14.6 mg of Al/L at pH 7.5	-	The 48-hr LC50 for Ceriodaphnia dubia exposed to Aluminium chloride increased from 0.72 to greater than 99.6 mg/L with water hardness increasing from 25 to 200 mg/L.
Barium peroxide 1304-29-6	The 72 h EC50 of Barium dichloride to Pseudokirchneriella subcapitata was greater than 30.1 mg Ba/L.	-	-	The 48-hr EC50 for Daphnia magna exposed to Barium dichloride dihydrate was 14.5 mg/L.

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.

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

14. TRANSPORT INFORMATION

DOT Regulated

UN/ID No.	3132
Proper shipping name	Water reactive Solid, Flammable, n.o.s. (Aluminum Powder)
Hazard Class	4.3
Subsidiary class	4.1
Packing Group	II
Special Provisions	IB4, T3, 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	Not Listed
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

Chemical Name	CAS No.	Weight-%	SARA 313 - Threshold Values %
Barium peroxide - 1304-29-6	1304-29-6	15	1.0

SARA 311/312 Hazard Categories

Acute health hazard	Yes
Chronic Health Hazard	No
Fire hazard	Yes
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
Aluminum 7429-90-5	X	X	X
Barium peroxide 1304-29-6	X	X	X

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

16. OTHER INFORMATION

NFPA	**Health hazards** 0	**Flammability** 1	**Instability** 0	**Physical and Chemical Properties** -
HMIS	**Health hazards** 1	**Flammability** 2	**Physical hazards** 1	**Personal protection** X

Chronic Hazard Star Legend ** = Chronic Health Hazard*

Issue Date 25-Mar-2020
Revision Date 25-Mar-2020
Revision Note
Updated to comply with GHS

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