

SAFETY DATA SHEET

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SECTION 1. IDENTIFICATION

Product Identifier: (4N) 99.99% Hafnium Oxynitrate Dihydrate

Product Code: HF-ONAT-04-C.2HYD

CAS Number: 15060-56-7

Relevant identified uses of the substance: Scientific research and development

Supplier details:

American Elements
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Emergency telephone number:
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SECTION 2. HAZARDS IDENTIFICATION

Classification

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

Acute toxicity - Oral Category 4

Skin corrosion/irritation Category 1B

Serious eye damage/eye irritation Category 1

Oxidizing solids Category 2

Label elements

Emergency Overview

Signal Word:

Danger

Hazard statements:

H272: May intensify fire; oxidizer

Causes severe skin burns and eye damage

H314: Causes serious eye damage

H302: Harmful if swallowed



Appearance: Powder

Physical state: Powder

Odor: Pungent, Slight nitric

Precautionary Statements - Prevention

P280: Wear protective gloves/protective clothing/eye protection/face protection

P260: Do not breathe dust/gas/mist

P270: Do not eat, drink or smoke when using this product

P264: Wash hands thoroughly after handling

P210: Keep away from heat/sparks/open flames/hot surfaces. - No smoking

P220: Store away from flammable substances, reducing agents, metal powders, and organic materials.

Precautionary Statements - Response

P301+330+331+P310: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Immediately call a POISON CENTER or doctor/physician

P303+P335+P361+P353: IF ON SKIN (or hair): Brush off loose particles from skin, Remove/Take off immediately all contaminated clothing, Rinse skin with water/shower

P304+340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

P305+351+338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

P363: Wash contaminated clothing before reuse

P370+378: In case of fire: Use media appropriate for class of fire for extinction.

Precautionary Statements - Storage

P402: Store in a dry place

Precautionary Statements - Disposal

P501: Dispose of contents/container to an approved waste disposal plant

Hazards not otherwise classified (HNOC)

N/A

Other Information

N/A

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms Hafnium Nitrate Oxide, Hafnium Nitrate Hydroxide, Hafnium Binitrate Dihydroxide, Hafnium Nitrate (Product #416).

Chemical Name CAS No. Weight-%

Hafnium Dinitrate Oxide 15060-56-7 >99%

SECTION 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 Do NOT induce vomiting. Have patient drink large quantities of water if able. Call Physician immediately for further instructions.

Most important symptoms and effects, both acute and delayed

Symptoms May cause acute gastrointestinal effects if swallowed. 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.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media

Material is a strong oxidizer but is itself not flammable. Select extinguishing media appropriate for class of fire.

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.

Explosion data

Sensitivity to Mechanical Impact None.

Sensitivity to Static Discharge None.

Protective equipment and precautions for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH approved (or equivalent) respirator and full protective gear.

SECTION 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. 140.

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. 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

Precautions for safe handling

Advice on safe handling Protect from moisture: Reacts with water. Ensure adequate ventilation, especially in confined areas.

Conditions for safe storage, including any incompatibilities 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.

Incompatible materials Water, alcohols, phenols, and amines. Rubber, coatings, and some plastics.
Flammable substances, reducing agents, metal powders, and organic materials. Reacts with metals to produce heat and corrosive gases.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Chemical Name ACGIH TLV OSHA PEL

Hafnium Dinitrate Oxide

15060-56-7

- - 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 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.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state - Powder

Appearance - Powder

Color - white

Odor Pungent, Slight nitric

pH - <1

Melting point/freezing point - Boiling point / boiling range - Flash point - N/A

Evaporation rate - N/A

Flammability (solid, gas) - Not flammable

Flammability Limit in Air

Upper flammability limit: -

Lower flammability limit: -

Vapor pressure - N/A

Vapor density - N/A

Specific Gravity 1.7

Water solubility Soluble in water

Solubility in other solvents - Partition coefficient - Autoignition temperature - N/A

Decomposition temperature - N/A

Kinematic viscosity - N/A

Dynamic viscosity - N/A
Explosive properties N/A
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 (%) N/A
Density
Bulk density 48 lb/ft³

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

Chemical stability

Stable under recommended storage conditions.

Possibility of Hazardous Reactions

Reacts with water.

Hazardous polymerization Hazardous polymerization does not occur.

Conditions to avoid

Unintentional contact with water. Heat. Static discharge.

Incompatible materials

Water, alcohols, phenols, and amines. Rubber, coatings, and some plastics. Flammable substances, reducing agents, metal powders, and organic materials. Reacts with metals to produce heat and corrosive gases.

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.

Chemical Name

Hafnium Dinitrate Oxide

CAS 15060-56-7

Oral LD50: > 300 and < 2000 mg/kg bw

Dermal LD50 -

Inhalation LC50 -

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.

Delayed and immediate effects as well as chronic effects from short and long-term exposure
Acute toxicity Harmful if swallowed.
Skin corrosion/irritation May cause severe skin burns.
Serious eye damage/eye irritation May cause serious eye damage.
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.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity
This product as shipped is not classified for aquatic toxicity.
Chemical Name Algae/aquatic plants Fish Toxicity to
microorganisms
Crustacea
Hafnium Dinitrate Oxide
15060-56-7
The 72 h EC50 of zirconium
dichloride oxide to
Pseudokirchnerella
subcapitata was 80% v/v
saturated solution.
The 96 h LL50 of zirconium
dinitrate oxide to
Oncorhynchus mykiss was
greater than 100 mg/L.
- The 48 h EC50 of zirconium
dioxide to Daphnia magna
was greater than 100 mg/L.
Persistence and degradability
.Bioaccumulation
Other adverse effects

SECTION 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.

SECTION 14. TRANSPORT INFORMATION

DOT Regulated

UN/ID No. 3085
Proper shipping name Oxidizing Solid, Corrosive, n.o.s. (Hafnium Oxynitrate)
Hazard Class 5.1
Subsidiary class 8
Packing Group II
Special Provisions 62, IB8, IP3, T1, TP33
Emergency Response Guide Number 140

SECTION 15. REGULATORY INFORMATION

International Inventories

TSCA Not Listed

DSL/NDSL Not Listed

EINECS/ELINCS Not Listed

ENCS Not Listed

IECSC Not Listed

KECL Not Listed

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

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 Yes

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

16. OTHER INFORMATION

Safety Data Sheet according to Regulation (EC) No. 1907/2006 (REACH). The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. American Elements shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. COPYRIGHT 1997-2022 AMERICAN ELEMENTS. LICENSED GRANTED TO MAKE UNLIMITED PAPER COPIES FOR INTERNAL USE ONLY.