



118 Julian Place, Suite 137
Syracuse, NY 13210
Tel: (315) 802-4332
Sales@QSrarematerials.com

VERSION 1.1

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Safety Data Sheet

I. PRODUCT IDENTIFICATION

Manufacturer/Supplier:

QS Rare Elements, LLC
118 Julian PI Ste137
Syracuse, NY 13210
Tel: (315) 802-4332
E-mail: Sales@QSrarematerials.com

Product Name: Hafnium Fluoride (HfF₄) Sputtering Targets

Formula of major composition: HfF₄

CAS Number: 13709-52-9

II. HAZARDOUS INGREDIENTS

Hazardous Component: Hafnium Fluoride
Percent (%): 0-100
OSHA/PEL: N/E
ACGIH/TLV: N/E

HMIS Ratings:

Health: 0
Flammability: 0
Reactivity: 0

III. PHYSICAL DATA

Boiling Point: N.A.
Melting Point: N.A.
Specific Gravity: No data.
Solubility in H₂O: Insoluble



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Appearance and Odor: White Solid, no odor.

IV. FIRE AND EXPLOSION HAZARDS DATA

Flash Point: N/A
Flammability: N/A
Autoignition Temperature: N/A
Flammable Limits: **Upper:** NA
Lower: NA

Extinguishing Media: Use suitable extinguishing media for surrounding material and type of fire.
Special Firefighting Procedures: Firefighters must wear full face, self-contained breathing apparatus with full protective clothing to prevent contact with skin and eyes. Fumes from fire are hazardous. Isolate runoff to prevent environmental pollution.
Unusual Fire & Explosion Hazards: NA

V. HEALTH HAZARD INFORMATION

Effects of Exposure:

To the best of our knowledge the chemical, physical and toxicological properties of boron nitride have not been thoroughly investigated and recorded.

Hafnium Fluoride : Industrially, this element does not constitute an important health hazard. Exposure is related chiefly to the dust arising from the crushing and milling of the two chief ores. Large overdoses cause central nervous system disturbances, diarrhea, respiratory failure and death in experimental animals. (Sax, Dangerous Properties of Industrial Materials eighth edition)

Acute Effects:

Inhalation: Acute: Powder may cause irritation to the lungs and respiratory tract.
Chronic: No chronic health effects recorded.

Ingestion: Acute: No acute health effects recorded. Relatively non-toxic, poorly absorbed from the alimentary tract.
Chronic: Large overdoses may cause nervous system disturbances, and diarrhea.

Skin: Acute: Powder may cause abrasive irritation.
Chronic: No chronic health effects recorded.

Eye: Acute: Powder may cause abrasive irritation.
Chronic: No chronic health effects recorded.



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Chronic Effects:

Target Organs: May affect the respiratory and central nervous system.

Medical Conditions Generally Aggravated by Exposure: Pre-existing respiratory disorders.

Carcinogenicity: NTP: No IARC: No OSHA: No

EMERGENCY AND FIRST AID PROCEDURES:

INHALATION: Remove victim to fresh air; keep warm and quiet; give oxygen if breathing is difficult and seek medical attention if symptoms persist.

INGESTION: Not applicable.

SKIN: Remove contaminated clothing; brush material off skin; wash affected area with mild soap and water; seek medical attention if symptoms persist.

EYE: Flush eyes with lukewarm water, lifting upper and lower eyelids, for at least 15 minutes. Seek medical attention if symptoms persist.

VI. REACTIVITY DATA

Stability: Stable
Conditions to Avoid: None
Incompatibility (Material to Avoid): Hydrochloric acid, Sulfuric acid, Nitric acid and other strong acids.
Hazardous Decomposition Products: None recorded.
Hazardous Polymerization: Will not occur

VII. SPILL OR LEAK PROCEDURES

Steps to Be Taken in Case Material Is Released or Spilled: Wear appropriate respiratory and protective equipment specified in section VIII. Ventilate area of spill. Vacuum up spill using a high efficiency particulate absolute (HEPA) filter and place in a closed container for proper disposal. Take care not to raise dust.

Waste Disposal Method: Disposal must be made in accordance with Federal, State and Local regulations.

VIII. SPECIAL PROTECTION INFORMATION

Respiratory Protection: NIOSH approved respirator.
Ventilation: Use local exhaust to limit personal exposure to levels which do not exceed the TLV. General exhaust is recommended.
Protective Gloves: Rubber gloves
Eye Protection: Safety glasses
Other Protective Clothing or Equipment: Protective gear suitable to prevent contamination.



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IX. SPECIAL PRECAUTIONS

Precautions to Be Taken in Handling and Storage: Store in a cool, dry area. Store in tightly sealed containers. Wash thoroughly after handling.

Work Practices: Implement engineering and work practice controls to reduce and maintain concentration of exposure at low levels. Use good housekeeping and sanitation practices. Do not use tobacco or food in work area. Wash thoroughly before eating and smoking. Do not blow dust off clothing or skin with compressed air. Maintain eyewash capable of sustained flushing, safety drench shower and facilities for washing.

TSCA Listed: Yes

DOT Regulations:

Hazard Class: None

The above information is believed to be correct, but does not purport to be all inclusive and shall be used only as a guide. **QSRE** shall not be held liable for any damage resulting from handling or from contact with the above product.