

1. PRODUCT AND COMPANY IDENTIFICATION

Trade Name: Hafnium Fluoride
Chemical Formula: HfF₄
Manufacturer Item Number: HA-2140
Manufacturer: Lorad Chemical Corporation
 1200 19th Street North
 Saint Petersburg, Florida, 33713
 United States of America
Telephone: +1 (727) 826-5511
Fax: +1 (727) 826-5510
Emergency Contact: (800) 255-3924 (US & Canada)
 +1 (813) 248-0573 (International)

2. HAZARD IDENTIFICATION

Signal Word: Danger

Pictograms:



Hazard Statements:
 H315 Causes skin irritation.
 H318 Causes serious eye damage.
 H331 Toxic if inhaled.
 H335 May cause respiratory irritation.

Precautionary Statements:
 P261 Avoid breathing dust / fume / gas / mist / vapors / spray.
 P264 Wash skin thoroughly after handling.
 P271 Use only outdoors or in a well-ventilated area.
 P280 Wear protective gloves / eye protection / face protection.
 P302+352 IF ON SKIN: Wash with plenty of soap and water.
 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.
 P310 Immediately call a POISON CENTER / physician.
 P332+313 If skin irritation occurs: Get medical advice / attention.
 P362 Take off contaminated clothing and wash before reuse.
 P403+233 Store in a well-ventilated place. Keep container tightly closed.
 P405 Store locked up.
 P501 Dispose of contents / container to an approved waste disposal plant.

HMIS Health Ratings (0-4)

- Health: 4
 - Flammability: 0
 - Physical: 0

3. COMPOSITION

Additional Names: Hafnium Tetrafluoride; Hafnium(IV) Fluoride

Percentage: 100 wt%

CAS #: 13709-52-9

EC #: 237-258-0

4. FIRST AID PROCEDURES

General Treatment Consult a physician. Show this SDS to the physician in attendance. Move out of dangerous area.

Special Treatment: Hydrofluoric (HF) acid burns require immediate and specialized first aid and medical treatment. Symptoms may be delayed up to 24 hours depending on the concentration of HF. After decontamination with water, further damage can occur due to penetration / absorption of the fluoride ion. Treatment should be directed towards binding the fluoride ion as well as the effects of exposure. Skin exposures can be treated with a 2.5% calcium gluconate gel repeated until burning ceases. More serious skin exposures may require subcutaneous calcium gluconate except for digital areas until the physician is experienced in this technique, due to the potential for tissue injury from increased pressure. Absorption can readily occur through the subungual areas and should be considered when undergoing decontamination. Prevention of absorption of the fluoride ion in cases of ingestion can be obtained by giving milk, chewable calcium carbonate tablets or milk of magnesia to conscious victims.

Important Symptoms: Causes burns by all exposure routes. Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated. Ingestion may cause severe swelling, damage to the delicate tissue and danger of perforation.

Inhalation: If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

Ingestion: Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

Skin: Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

Eyes: Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

5. FIREFIGHTING MEASURES

Flammability: Not Flammable.

Special Hazards from Substance: No Data Available.

Extinguishing Media: Carbon Dioxide, Dry Powder

Special Fire Fighting Procedures: Wear self-contained breathing apparatus for firefighting if necessary.

6. ACCIDENTAL RELEASE MEASURES

If Material is Released / Spilled: Wear respiratory protection. Avoid dust formation. Avoid breathing dust, vapors, mist, or gas. Isolate spill area and provide ventilation. Evacuate personnel to safe areas. Pick up and arrange disposal without creating dust. Sweep up and shovel. Do not flush with water. Keep in suitable closed containers for disposal.

Environmental Precautions: Prevent further leakage or spills if safe to do so. Do not allow to enter drains, sewers, or watercourses.

7. HANDLING AND STORAGE

Handling Conditions: Avoid contact with skin and eyes. Avoid formation of dust and aerosols.

Storage Conditions:	Keep container tightly closed in a dry and well-ventilated place. Never allow product to get in contact with water during storage.
Work / Hygienic Maintenance:	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.
Ventilation:	Provide appropriate exhaust ventilation at places where dust is formed.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Permissible Exposure Limits:	Authority	Basis	Limit	Remarks
	ACGIH	BEI	3.0 mg/g	Fluorides in urine prior to shift (16 hours after exposure ceases)
	ACGIH	BEI	10.0 mg/g	Fluorides in urine end of shift (as soon as possible after exposure ceases)
	ACGIH	BEI	2.0 mg/l	Fluorides in urine prior to shift (16 hours after exposure ceases)
	ACGIH	BEI	3.0 mg/l	Fluorides in urine end of shift (as soon as possible after exposure ceases)
	California	PEL	2.50 mg/m ³	Fluorides - California permissible exposure limit for chemical contaminants (Title 8, Article 107) (8-hour time weighted average)
	California	PEL	0.5 mg/m ³	Hafnium (as Hf) - California permissible exposure limit for chemical contaminants (Title 8, Article 107) (8-hour time weighted average)
	OSHA	PEL	0.5 mg/m ³	Hafnium (as Hf) - USA Occupational Exposure Limit (air contaminant) (Table Z-1) (time weighted average).
Threshold Limit Value:	Authority	Basis	Limit	Remarks
	OSHA	OEL	2.50 mg/m ³	Fluorides (as F) - USA Occupational Exposure Limit (Table Z-2)
	OSHA	OEL	2.50 mg/m ³	Fluoride as dust - USA Occupational Exposure Limit (air contaminant) (Table Z-1)
	ACGIH	TLV	2.50 mg/m ³	Bone damage. Fluorosis. Substance for which there is a biological exposure index. Not classifiable as human carcinogen.
	ACGIH	TLV	0.5 mg/m ³	Hafnium (as Hf) - upper respiratory tract irritation, eye irritation, liver damage (8-hour time weighted average)
	NIOSH	REL	0.5 mg/m ³	Hafnium (as Hf) - USA Occupational Exposure Limit (air contaminant) (Table Z-1) (up to 10-hour time weighted average).
Special Equipment:	Engineer environmental controls to ensure adequate ventilation and avoid contact with skin, eyes, and clothing. Wash hands thoroughly before breaks and immediately after handling the product.			
Respiratory Protection:	Where risk assessment shows air-purify respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).			
Protective Gloves:	Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching the glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.			

SAFETY DATA SHEET

Eye Protection:	Face shield and safety glasses. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166 (EU).
Body Protection:	Complete suit protecting against chemicals. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

9. PHYSICAL AND CHEMICAL CHARACTERISTICS

Color:	White	Molecular Weight:	254.48 g/mol
Forms:	Powder	Density:	7.1 g/cm ³
Odor:	No Data Available.	pH:	No Data Available.
Water Solubility:	No Data Available.	Auto-Ignition Temperature:	No Data Available.
Boiling Point:	No Data Available.	Evaporation Rate:	No Data Available.
Melting Point / Freezing Point:	> 968°C (> 1774°F)	Flammability or Explosive Limits:	No Data Available.
Vapor Pressure:	No Data Available.	Partition Coefficient: n-octanol/ water	No Data Available.
Vapor Density:	No Data Available.	Decomposition Temperature:	No Data Available.
Flash Point:	No Data Available.	Viscosity:	No Data Available.

10. REACTIVITY

Stability:	Stable under recommended storage conditions.
Reacts with:	Reacts violently with water.
Incompatible Conditions:	Strong Oxidizing Agents, Acids, Moisture
Hazardous Decomposition Products:	Hazardous decomposition products formed under fire conditions includes Hafnium Oxide, Hydrogen Fluoride, Metal Oxide fumes

11. TOXICOLOGICAL INFORMATION

Acute Toxicity	Eyes:	May cause irritation.
	Skin:	May cause irritation.
	Ingestion:	May cause salivation, nausea, vomiting, fever.
	Inhalation:	May cause respiratory irritation on inhalation. May cause salivation, nausea, Vomiting, or fever.
Chronic Toxicity	Irritation:	No Data Available.
	Sensitization:	No Data Available.
	Mutagenic Effects:	No Data Available.
	Reproductive Effects:	No Data Available.
Specific Target Organ Toxicity: (single exposure)		There are reports of liver damage from Hafnium exposure. Fluorides may cause salivation, nausea, vomiting, diarrhea, and abdominal pain, followed by weakness, tremors, shallow respiration, convulsions, and coma. May cause brain and kidney damage.

Specific Target Organ Toxicity: Chronic fluoride poisoning can cause severe bone changes, loss of weight, (repeated exposure) anorexia, anemia, and dental defects.

Aspiration Hazard: No Data Available.

Other Adverse Effects: No Data Available.

Carcinogenicity:

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable or confirmed human carcinogen by IARC.

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

12. ECOLOGICAL INFORMATION

Aquatic Toxicity: No Data Available.

Persistence and degradability: No Data Available.

Bioaccumulative potential: No Data Available.

Notes: No Data Available.

13. DISPOSAL CONSIDERATIONS

Disposal: Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Empty containers should be taken to an appropriate waste handling site for recycling or disposal. Dispose of in accordance with local, state, or national regulations.

14. TRANSPORTATION DATA

Hazardous: **DoT:** Hazardous for Transportation
IMDG: Hazardous for Transportation
IATA: Hazardous for Transportation

Pictogram:



Hazard Class: 6.1 Toxic substances

Packing Group: III

UN Number: UN3288

SAFETY DATA SHEET

Proper Shipping Name: **DoT:** Toxic solid, inorganic, n.o.s. (Hafnium(IV) Fluoride).
Poison Inhalation Hazard: No

IMDG: TOXIC SOLID, INORGANIC, N.O.S. (Hafnium(IV) Fluoride)
EMS-No: F-A, S-A

IATA: Toxic solid, inorganic, n.o.s. (Hafnium Fluoride).

15. REGULATORY INFORMATION

SARA 302 Components No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components This material does not contain any chemical component with known CAS numbers that exceed the threshold (de minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards Acute Health Hazard

Massachusetts Right to Know Components No components are subject to the Ma. Right to Know Act.

Pennsylvania Right to Know Components Hafnium Fluoride (CAS No. 13709-52-9).

New Jersey Right to Know Components Hafnium Fluoride (CAS No. 13709-52-9).

California Prop. 65 Components This product does not contain any chemicals known to the State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Copyright 2018 Lorad Chemical Corporation. 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 does not constitute a hazard assessment and should not be used in place of the user's own assessment of work place risks as required by other health and safety legislation. The information in this sheet does not represent a guarantee of the properties of the product. Lorad Chemical Corporation and its Affiliates make no warranty with respect to the accuracy of the information or the suitability of this product for any particular application, and shall not be held liable for any damage resulting from handling or from contact with the above product.

Revision Date: 07/18/2018