



# SAFETY DATA SHEET

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## SECTION 1 PRODUCT AND COMPANY INFORMATION

PRODUCT NAME: **Hafnium (IV) fluoride**

PRODUCT NUMBER: 1955

CAS NUMBER: 13709-52-9

SYNONYMS: Hafnium Tetrafluoride

### MANUFACTURER:

Prochem, Inc.  
826 Roosevelt Road  
Rockford, IL 61109

PHONE: 815-398-1788  
FAX: 815-398-1810  
TOLL FREE: 800-795-8788

IN CASE OF TRANSPORTATION EMERGENCY CONTACT CHEM-TREC: 1-800-424-9300

## SECTION 2 HAZARDS IDENTIFICATION

### CLASSIFICATION OF SUBSTANCE OR MIXTURE

Pictogram



Signal Word

**Danger**

### Hazard Statements

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

### Precautionary Phrases

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/protective clothing/eye protection/face protection.
P301+P310	IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P302+P352	IF ON SKIN: Wash with plenty of soap and water.
P304+P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
P362	Take off contaminated clothing and wash before reuse.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.

## SECTION 2 HAZARDS IDENTIFICATION (Cont.)

### HMIS CLASSIFICATION:

Health: 4 Fire: 0 Reactivity Hazard: 0

### NFPA RATING:

Health: 4 Flammability: 0 Reactivity Hazard: 0

**EYE CONTACT:** Causes serious eye damage.

**SKIN CONTACT:** Causes skin irritation.

**INHALATION:** Toxic if inhaled.

**INGESTION:** Harmful if swallowed.

## SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

Formula: HfF<sub>4</sub>

Molecular Weight: 254.48

CHEMICAL NAME	CAS#	%
Hafnium (IV) Fluoride	13709-52-9	100

## SECTION 4 FIRST AID MEASURES

**EYE EXPOSURE:** Immediately flush the eyes with copious amounts of water for at least 15 minutes. Assure flushing under eyelids. A victim may need assistance in keeping their eyelids open. Get immediate competent medical attention.

**SKIN EXPOSURE:** Wash affected area with soap and plenty of water. Remove contaminated clothes if necessary. Seek medical assistance if irritation persists.

**INHALATION:** Remove to fresh air and keep at rest. Closely monitor the victim for signs of respiratory problems, such as difficulty in breathing, coughing, wheezing, or pain. In such cases, seek immediate medical assistance.

**INGESTION:** Seek medical assistance immediately. Keep the victim calm. Give the victim water (only if conscious). Induce vomiting only if directed by medical personnel.

## SECTION 5 FIREFIGHTING MEASURES

**FLASH POINT:** Not applicable

**AUTO IGNITION TEMPERATURE:** Not available

**EXPLOSION LIMITS:** Not available

**EXTINGUISHING MEDIUM:** Carbon dioxide, extinguishing powder, or water spray. Fight large fires with water spray or alcohol resistant foam.

**SPECIAL FIRE FIGHTING PROCEDURES:** Wear self-contained, approved breathing apparatus and full protective clothing, including eye protection and boots.

**HAZARDOUS COMBUSTION AND DECOMPOSITION PRODUCTS:** Hydrogen fluoride and hafnium oxides

## SECTION 6 ACCIDENTAL RELEASE MEASURES

**PERSONAL PRECAUTIONS:** Wear all appropriate equipment when using this material. Ensure adequate ventilation. Avoid the formation of dust. Avoid breathing vapors, mist, gas, or dust.

**ENVIRONMENTAL PRECAUTIONS:** Prevent spillage from entering drains or allowing to be released into the environment.

**METHODS AND MATERIALS FOR CONTAINMENT AND CLEANING UP:** Use neutralizing agent. Sweep up and place in suitable container for proper disposal.

## SECTION 7 HANDLING AND STORAGE

**PRECAUTIONS FOR SAFE HANDLING:** Wear appropriate personal protective equipment. Avoid contact with skin and eyes. Use with adequate ventilation. Avoid formation of dusts and aerosols. Handle under dry protective gas. Open and handle container with care.

**CONDITIONS FOR SAFE STORAGE:** Store in cool, dry, and well-ventilated area. Store under dry inert gas. This product is moisture sensitive – protect from humidity and water. Store away from water, moisture, strong bases, and oxidizing agents.

## SECTION 8 EXPOSURE CONTROLS AND PERSONAL PROTECTION

### EXPOSURE CONTROLS:

Component	Exposure Limits	Basis	Entity
Hafnium (IV) Fluoride	2.5 mg/m <sup>3</sup> (As Fluorine)	TLV	ACGIH
	2.5 mg/m <sup>3</sup> (As Fluorine)	PEL	OSHA
	0.5 mg/m <sup>3</sup> (As Hafnium)	REL	NIOSH
	0.5 mg/m <sup>3</sup> (As Hafnium)	TLV	ACGIH
	0.5 mg/m <sup>3</sup> (As Hafnium)	PEL	OSHA

TLV: Threshold Limit Value over 8 hours of work.

REL: Recommended Exposure Limit

PEL: Permissible Exposure Limit

**EYE PROTECTION:** Wear chemical safety glasses or goggles and face shield.

**SKIN PROTECTION:** Wear nitrile or rubber gloves, and a complete suit protecting against chemicals.

**VENTILATION:** Provide local exhaust, preferably mechanical.

**RESPIRATOR:** Use an approved respirator.

**ADDITIONAL PROTECTION:** Provide eyewash stations, quick-drench showers and washing facilities accessible to areas of use and handling.

## SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

**COLOR AND FORM:** White to off-white powder

**ODOR:** None

**MOLECULAR WEIGHT:** 254.48

**BOILING POINT:** 970° C (subl.)

**MELTING POINT:** No data available

**SPECIFIC GRAVITY:** 7.1 gm/ml

**SOLUBILITY:** Insoluble

## SECTION 10 STABILITY AND REACTIVITY

**STABILITY:** Stable

**HAZARDOUS POLYMERIZATION:** Will not occur

**CONDITIONS TO AVOID:** Exposure to moisture

**INCOMPATIBILITY:** Strong oxidizing agents, acids, and bases

**DECOMPOSITION PRODUCTS:** Hydrogen fluoride and hafnium oxides

## SECTION 11 TOXICOLOGICAL DATA

**ACUTE TOXICITY:** Not available

**CARCINOGENIC EFFECTS:** No components of this product present at levels greater than or equal to 0.1% is identified a carcinogen.

**MUTAGENIC EFFECTS:** Not available

**TETRATOGENIC EFFECTS:** Not available

**RTECS:** No data

Inorganic fluorides are generally highly irritating and toxic. Chronic fluorine poisoning, or "fluorosis," occurs among miners of cryolite, and consists of sclerosis of the bones, caused by fixation of the calcium by fluorine, there may also be some calcification of the ligaments. The teeth are mottled, there is osteosclerosis and ostemalacia. Large doses can cause very severe nausea, vomiting, diarrhea, aggravate attacks of asthma, and severe bone changes, making normal movements painful. Some signs of pulmonary fibrosis are noted. Some enzyme system effects are reported. Irritants to the eye, skin, and mucous membranes. Loss of weight anorexia, anemia, wasting and cachexia, and dental defects are among the common findings in chronic fluorine poisoning. There may be eosinophilia and impairment of growth in young workers. Symptoms of intoxication include gastric, intestinal, circulatory, respiratory, and nervous complaints and rashes. Hafnium is a poison by an unspecified route. It is poorly soluble in water and thus is not absorbed appreciably by ingestion. Many hafnium compounds are poisons.

To the best of our knowledge the toxicological effects of this compound have not been fully investigated.

## SECTION 12 ECOLOGICAL DATA

No data available.

## SECTION 13 DISPOSAL CONSIDERATIONS

Dispose of in according to local, state, and federal regulations.

## SECTION 14 TRANSPORTATION DATA

UN3290

Toxic solid, corrosive, inorganic, n.o.s.

(hafnium (IV) fluoride)

Class 6.1 (8)

PG II

Marine Pollutant: No

## SECTION 15 REGULATORY INFORMATION

**TSCA:** Not listed in the TSCA inventory

**SARA 302/304:** Not Listed

**SARA 311/312:** Acute Health Hazard

**SARA (TITLE 313):** Not Listed

**CALIFORNIA PROP. 65:** Not Listed

**MASSACHUSETTS RIGHT TO KNOW COMPONENTS:** No components are subject to the Massachusetts Right to Know Act.

**NEW JERSEY RIGHT TO KNOW COMPONENTS:** Hafnium (IV) fluoride

**PENNSYLVANIA RIGHT TO KNOW COMPONENTS:** Hafnium (IV) fluoride

## SECTION 16 OTHER INFORMATION

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DATE PREPARED: 01/15

SDS DEPT.