

SAFETY DATA SHEET

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product Name CGHF10

Product Description 10000 µg/mL: Hafnium
Contains Nitric acid; Hydrogen fluoride

1.2. Relevant identified uses of the substance or mixture and uses advised against

Recommended Use Laboratory chemicals

Uses advised against No information available

1.3. Details of the supplier of the safety data sheet

Company

Inorganic Ventures
300 Technology Drive
Christiansburg, VA 24073
Phone: 1(800) 669-6799
Email: info@inorganicventures.com

1.4. Emergency telephone number

Chemtrec 1-800-424-9300 (North America)

Chemtrec +1 703-741-5970 (International)

Europe	See above
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SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

*Classification according to
Regulation (EC) No. 1272/2008 [CLP]*

GHS

Acute toxicity - Oral	Category 4 - (H302)
Acute toxicity - Dermal	Category 3 - (H311)
Acute toxicity - Inhalation (Vapors)	Category 4 - (H332)
Acute toxicity - Inhalation (Dusts/Mists)	Category 4 - (H332)
Skin corrosion/irritation	Category 1 Sub-category B - (H314)
Serious eye damage/eye irritation	Category 1 - (H318)
Corrosive to metals	Category 1 - (H290)

2.2. Label elements

Product identifier

Contains Nitric acid; Hydrogen fluoride

**Signal word**

Danger

Hazard statements

H290 - May be corrosive to metals

H302 - Harmful if swallowed

H311 - Toxic in contact with skin

H314 - Causes severe skin burns and eye damage

H332 - Harmful if inhaled

EUH071 - Corrosive to the respiratory tract

Precautionary Statements - EU (§28, 1272/2008)

P260 - Do not breathe dust, fume, gas, mist, vapors and spray

P303 + P361 + P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower

P310 - Immediately call a POISON CENTER or doctor/physician

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

2.3. Other hazards

Other hazards

Toxic to aquatic life

Inhalation of vapors in high concentration may cause irritation of respiratory system

Aspiration may cause pulmonary edema and pneumonitis

SECTION 3: Composition/information on ingredients

3.1 Substances

Chemical name	EC No. (Index No.)	CAS No.	Weight-%	Classification according to Regulation (EC) No. 1272/2008 [CLP]	REACH registration number
Nitric acid	231-714-2 (007-004-00-1) (007-030-00-3) (078-012-00-0)	7697-37-2	7	(EUH071) Skin Corr. 1A (H314) Ox. Liq. 3 (H272) Acute Tox. 3 (H331)	No data available
Hydrogen fluoride	231-634-8 (009-002-00-6) (009-003-00-1)	7664-39-3	1.65	Acute Tox. 2 (H300) Acute Tox. 1 (H310) Skin Corr. 1A (H314) Acute Tox. 2 (H330)	No data available

Full text of H- and EUH-phrases: see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures**General Advice**

Immediate medical attention is required. Show this safety data sheet to the doctor in attendance.

Inhalation	Call a physician or poison control center immediately. Remove to fresh air. If breathing is difficult, give oxygen. If breathing is irregular or stopped, administer artificial respiration. Avoid direct contact with skin. Use barrier to give mouth-to-mouth resuscitation.
Skin Contact	Immediate medical attention is required. Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes.
Eye Contact	Immediate medical attention is required. Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Keep eye wide open while rinsing. Do not rub affected area.
Ingestion	Immediate medical attention is required. Do NOT induce vomiting. Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth to an unconscious person.
Self-protection of the first aider	Use personal protective equipment as required. Avoid contact with skin, eyes or clothing.

4.2. Most important symptoms and effects, both acute and delayed

Most Important Symptoms and Effects	Burn. Difficulty in breathing.
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4.3. Indication of any immediate medical attention and special treatment needed

Notes to Physician	Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated. Do not give chemical antidotes. Asphyxia from glottal edema may occur. Marked decrease in blood pressure may occur with moist rales, frothy sputum, and high pulse pressure In case of contact with Hydrogen fluoride, anhydrous (UN1052), flush skin and eyes with water for 5 minutes; then, for skin exposures rub on a calcium/jelly combination; for eyes flush with a water/calcium solution for 15 minutes
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SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable Extinguishing Media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable Extinguishing Media

No information available

5.2. Special hazards arising from the substance or mixture

Thermal decomposition can lead to release of irritating gases and vapors

5.3. Advice for firefighters

Wear self-contained breathing apparatus and protective suit. Use personal protection equipment.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal Precautions

Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Ensure adequate ventilation. Use personal protective equipment as required. Do not get in eyes, on skin, or on clothing.

Refer to protective measures listed in Sections 7 and 8.

Advice for emergency responders

Ensure adequate ventilation.

6.2. Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not flush into surface water or sanitary sewer system. Prevent product from entering drains. See Section 12 for additional Ecological Information.

6.3. 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 Take up mechanically, placing in appropriate containers for disposal.

6.4. Reference to other sections

See Section 12: ECOLOGICAL INFORMATION.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling

Ensure adequate ventilation.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice. Wear suitable gloves and eye/face protection. Avoid contact with skin, eyes or clothing. Do not eat, drink or smoke when using this product. Wash hands before breaks and immediately after handling the product. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Contaminated work clothing should not be allowed out of the workplace. Regular cleaning of equipment, work area and clothing is recommended.

7.2. Conditions for safe storage, including any incompatibilities

Storage Conditions

Keep container tightly closed in a dry and well-ventilated place.

7.3. Specific end use(s)

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Exposure Limits

Chemical name	European Union	United Kingdom	France	Spain	Germany DFG
Nitric acid 7697-37-2	STEL: 1 ppm; STEL: 2.6 mg/m ³ ;	STEL: 1 ppm; STEL: 2.6 mg/m ³ ;	STEL-VLCT (indicatif): 1 ppm; STEL-VLCT (indicatif): 2.6 mg/m ³ ;	STEL (VLA-EC): 1 ppm; STEL (VLA-EC): 2.6 mg/m ³ ;	
Hydrogen fluoride 7664-39-3	TWA: 1.8 ppm; TWA: 1.5 mg/m ³ ; STEL: 3 ppm; STEL: 2.5 mg/m ³ ;	TWA: 1.8 ppm; TWA: 1.5 mg/m ³ ; STEL: 3 ppm; STEL: 2.5 mg/m ³ ;	TWA-VME (restrictif): 1.8 ppm; TWA-VME (restrictif): 1.5 mg/m ³ ; STEL-VLCT (restrictif): 3 ppm; STEL-VLCT (restrictif): 2.5 mg/m ³ ;	TWA-(VLA-ED): 1.8 ppm; TWA-(VLA-ED): 1.5 mg/m ³ ; STEL (VLA-EC): 3 ppm; STEL (VLA-EC): 2.5 mg/m ³ ;	TWA-MAK: 1 ppm; I(2); TWA-MAK: 0.83 mg/m ³ ; I(2);
Chemical name	Italy MDLPS	Portugal	Netherlands	Finland	Denmark
Nitric acid	STEL: 1 ppm;	TWA (VLE-MP): 2 ppm;	STEL: 0.5 ppm;	TWA: 0.5 ppm;	STEL: 1 ppm;

7697-37-2	STEL: 2.6 mg/m³;	STEL (VLE-CD): 1 ppm; STEL (VLE-CD): 2.6 mg/m³;	STEL: 1.3 mg/m³;	TWA: 1.3 mg/m³; STEL: 1 ppm; STEL: 2.6 mg/m³;	STEL: 2.6 mg/m³;	
Hydrogen fluoride 7664-39-3	TWA: 1.8 ppm; TWA: 1.5 mg/m³; STEL: 3 ppm; STEL: 2.5 mg/m³;	TWA (VLE-MP): 1.8 ppm; TWA (VLE-MP): 1.5 mg/m³; TWA (VLE-MP): 2.5 mg/m³; STEL (VLE-CD): 3 ppm; STEL (VLE-CD): 2.5 mg/m³; Ceiling (VLE-CM): 2 ppm; pSk	STEL: 1.27 ppm; STEL: 1 mg/m³;	TWA: 1.8 ppm; TWA: 1.5 mg/m³; STEL: 3 ppm; STEL: 2.5 mg/m³; pSk	TWA: 1.8 ppm; TWA: 1.5 mg/m³; TWA: 2.5 mg/m³; STEL: 2.5 mg/m³; STEL: 3 ppm; STEL: 5 mg/m³;	
Chemical name	Sweden	Austria	Switzerland	Poland	Norway	Ireland
Nitric acid 7697-37-2	LLV: 0.5 ppm LLV: 1.3 mg/m³ Binding STLV: 1 ppm Binding STLV: 2.6 mg/m³	TWA-TMW: 1 ppm; TWA-TMW: 2.6 mg/m³; STEL-KZGW: 1 ppm (); STEL-KZGW: 2.6 mg/m³ (); Ceiling: 1 ppm; Ceiling: 2.6 mg/m³;	TWA-MAK: 2 ppm; TWA-MAK: 5 mg/m³; STEL-KZGW: 2 ppm; STEL-KZGW: 5 mg/m³;	TWA-NDS: 1.4 mg/m³; STEL-NDSch: 2.6 mg/m³;	TWA: 2 ppm; TWA: 5 mg/m³; STEL: 4 ppm (value calculated); STEL: 10 mg/m³ (value calculated);	STEL: 1 ppm; STEL: 2.6 mg/m³;
Hydrogen fluoride 7664-39-3	LLV: 1.8 ppm LLV: 1.5 mg/m³ Binding STLV: 2 ppm Binding STLV: 1.7 mg/m³	TWA-TMW: 1.8 ppm; TWA-TMW: 1.5 mg/m³; STEL-KZGW: 3 ppm (4 X 15 min); STEL-KZGW: 2.5 mg/m³ (4 X 15 min); Sk	TWA-MAK: 1 ppm; TWA-MAK: 0.83 mg/m³; STEL-KZGW: 2 ppm; STEL-KZGW: 1.66 mg/m³;	TWA-NDS: 0.5 mg/m³; TWA-NDS: 2 mg/m³; STEL-NDSch: 2 mg/m³;	TWA: 0.6 ppm; TWA: 0.5 mg/m³; STEL: 1.5 mg/m³ (value from the regulation); STEL: 1.8 ppm (value from the regulation); Sk	TWA: 1.5 mg/m³; TWA: 1.8 ppm; TWA: 2.5 mg/m³; STEL: 2.5 mg/m³; STEL: 3 ppm; STEL: 7.5 mg/m³ (calculated); pSk

Chemical name	European Union	United Kingdom	France	Spain	Germany TRGS
Hydrogen fluoride 7664-39-3			- urine (Fluorides) - beginning of shift - urine (Fluorides) - end of shift	2 mg/L (urine - Fluorides pre-shift) 3 mg/L (urine - Fluorides end of shift)	4.0 mg/g Creatinine (urine - Fluoride end of exposure or shift)
Chemical name	Austria	Switzerland	Poland	Norway	Ireland
Hydrogen fluoride 7664-39-3		4 mg/L (urine - Fluoride end of shift) 211 µmol/L (urine - Fluoride end of shift)			

Derived No Effect Level (DNEL) No information available

Predicted No Effect Concentration (PNEC) No information available.

8.2. Exposure controls

Engineering Measures Ensure adequate ventilation, especially in confined areas.

Personal protective equipment

Eye/Face Protection

Hand Protection

Skin and Body Protection

Respiratory Protection

Wear safety glasses with side shields (or goggles).

Impervious gloves.

Impervious clothing. Boots. Chemical resistant apron.

When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn.

Environmental Exposure Controls Prevent product from entering drains.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	Liquid
Appearance	clear /colorless
Odor	Odorless
pH - VALUE 1	No data available
Melting point / melting range	No data available
Initial boiling point and boiling range	100 °C / 212 °F
Vapor pressure @20 °C (kPa)	No data available
Relative vapor density	No data available
Relative Density	No data available
Specific gravity - VALUE 1	No data available
Water solubility	Miscible
Solubility in other solvents	No data available
Partition coefficient: n-octanol/water	No data available
Autoignition temperature	No data available
Decomposition temperature	No data available
Dynamic viscosity - VALUE 1	No data available
Explosive properties	No information available
Oxidizing Properties	No information available
VOC content	No information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No data available.

10.2. Chemical stability

Stable under normal conditions.

Explosion data

Sensitivity to Mechanical Impact	None.
Sensitivity to Static Discharge	None.

10.3. Possibility of hazardous reactions

Hazardous polymerization

None under normal processing.

Hazardous Reactions

None under normal processing.

10.4. Conditions to avoid

Heating can release hazardous gases.

10.5. Incompatible materials

Bases Cyanides

10.6. Hazardous decomposition products

Nitrogen oxides (NOx). Hydrogen fluoride.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute Toxicity

<u>Product Information</u>	Toxic by inhalation. Toxic in contact with skin. Toxic if swallowed. The product causes burns of eyes, skin and mucous membranes.
Inhalation	Toxic by inhalation. Causes burns. Inhaled corrosive substances can lead to a toxic edema of the lungs. Corrosive to respiratory system. Contact with moist mucous membranes of the respiratory system can cause caustic condition resulting in burns. Aspiration may cause pulmonary edema and pneumonitis.
Eye Contact	Causes burns.
Skin Contact	Toxic in contact with skin. May be absorbed through the skin in harmful amounts. Causes burns. Symptoms may be delayed.
Ingestion	Toxic if swallowed. Can burn mouth, throat, and stomach.

The following ATE values have been calculated for the mixture

ATEmix (oral)	303.60 mg/kg
ATEmix (dermal)	303.00 mg/kg
ATEmix (inhalation-gas)	29,265.90 ppm
ATEmix (inhalation-dust/mist)	2.13 mg/l
ATEmix (inhalation-vapor)	16.80 mg/l
<u>Unknown acute toxicity</u>	
8.1345 % of the mixture consists of ingredient(s) of unknown acute toxicity.	
8.1345 % of the mixture consists of ingredient(s) of unknown acute oral toxicity.	
8.1345 % of the mixture consists of ingredient(s) of unknown acute dermal toxicity.	
8.1345 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (gas).	
1.1345 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (vapor).	
1.1345 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (dust/mist).	

Component Information

Skin corrosion/irritation	No information available.
Serious eye damage/eye irritation	No information available.
Sensitization	No information available.
Mutagenic Effects	No information available.
Carcinogenic effects	
Reproductive Toxicity	No information available.
STOT - single exposure	No information available.
STOT - repeated exposure	No information available.
Target organ effects	Skin, Eyes, Respiratory system.
Aspiration hazard	No information available.

SECTION 12: Ecological information

12.1. Toxicity

Contains 0 % of components with unknown hazards to the aquatic environment

Chemical name	Algae/aquatic plants	Fish	Crustacea
Hydrogen fluoride			EC50: =270mg/L (48h, Daphnia species)

12.2. Persistence and degradability

No information available.

12.3. Bioaccumulative potential

No information available.

Chemical name	Partition coefficient
Nitric acid	-2.3
Hydrogen fluoride	-1.4

12.4. Mobility in soil

Mobility in soil

No information available.

12.5. Results of PBT and vPvB assessment

No information available.

Chemical name	PBT and vPvB assessment
Nitric acid	Not PBT/vPvB
Hydrogen fluoride	Not PBT/vPvB

12.6. Other adverse effects

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste from Residues/Unused Products

Dispose of in accordance with federal, state and local regulations.

Contaminated Packaging

Do not reuse empty containers.

Other information

Waste codes should be assigned by the user based on the application for which the product was used.

SECTION 14: Transport information

IMDG

14.1. UN-No

UN2922

14.2. Proper shipping name

Corrosive liquid, toxic, n.o.s

14.3. Transport hazard class(es)

8

Subsidiary hazard class 6.1
 14.4. Packing Group III
 Description Not applicable
 14.5. Marine Pollutant None
 14.6. Special Provisions None
 No information available Transport No information available
 in bulk according
 to Annex II of MARPOL 73/78 and
 the IBC Code

RID

14.1. UN-No UN2922
 14.2. Proper shipping name Corrosive liquid, toxic, n.o.s
 14.3. Transport hazard class(es) 8 (6.1)
 14.4. Packing Group III
 Description Not applicable
 14.5. Environmental hazard None
 14.6. Special Provisions None

ADR

14.1. UN-No UN2922
 14.2. Proper shipping name Corrosive liquid, toxic, n.o.s
 14.3. Transport hazard class(es) 8 (6.1)
 14.4. Packing Group III
 Description Not applicable
 14.5. Environmental hazard None
 14.6. Special Provisions None

ICAO

14.1. UN-No UN2922
 14.2. Proper Shipping Name Corrosive liquid, toxic, n.o.s
 14.3. Hazard Class 8
 Subsidiary hazard class 6.1
 14.4. Packing Group III
 Description Not applicable
 14.5. Environmental hazard None
 14.6. Special Provisions None

IATA-DGR

14.1. UN-No UN2922
 14.2. Proper shipping name Corrosive liquid, toxic, n.o.s
 14.3. Transport hazard class(es) 8
 Subsidiary hazard class 6.1
 14.4. Packing Group III
 Description Not applicable
 14.5. Environmental hazard None
 14.6. Special Provisions None

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

European Union

Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work

International Inventories

All of the components in the product are on the following Inventory lists: U.S.A. (TSCA), Europe (EINECS/ELINCS/NLP), Canada (DSL/NDSL), Philippines (PICCS), Japan (ENCS), China (IECSC), Australia (AICS), Korea (ECL).

TSCA	Complies
EINECS/ELINCS	Complies
DSL/NDSL	Complies
PICCS	Complies
ENCS	Complies
IECSC	Complies
AIC	Complies
KECL	Complies

Legend

EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

PICCS - Philippines Inventory of Chemicals and Chemical Substances

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

AICS - Australian Inventory of Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

15.2. Chemical safety assessment

No information available

SECTION 16: Other information**Full text of R-phrases referred to under sections 2 and 3**

No information available

Full text of any hazard and/or precautionary statements referred to under Sections 2-15

EUH071 - Corrosive to the respiratory tract

H272 - May intensify fire; oxidizer

H300 - Fatal if swallowed

H310 - Fatal in contact with skin

H314 - Causes severe skin burns and eye damage

H330 - Fatal if inhaled

H331 - Toxic if inhaled

Revision date 28-May-2026

Reason for Revision Not applicable.

This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006

Disclaimer

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