

## SAFETY DATA SHEET

Creation Date 06-July-2010

Revision Date 24-December-2021

Revision Number 9

### 1. Identification

**Product Name** Hafnium atomic absorption standard solution

**Cat No. :** AC196010000; AC196011000; AC196015000

**Synonyms** Hydrofluoric acid solution; Fluohydric acid; Fluoric acid

**Recommended Use** Laboratory chemicals.  
**Uses advised against** Food, drug, pesticide or biocidal product use.

#### Details of the supplier of the safety data sheet

##### Company

**Importer/Distributor**  
Fisher Scientific  
112 Colonnade Road,  
Ottawa, ON K2E 7L6,  
Canada  
Tel: 1-800-234-7437

Acros Organics  
One Reagent Lane  
Fair Lawn, NJ 07410

**Manufacturer**  
Fisher Scientific Company  
One Reagent Lane  
Fair Lawn, NJ 07410  
Tel: (201) 796-7100

**Emergency Telephone Number** For information **US** call: 001-800-ACROS-01 / **Europe** call: +32 14 57 52 11  
Emergency Number **US**:001-201-796-7100 / **Europe**: +32 14 57 52 99  
**CHEMTREC** Tel. No.**US**:001-800-424-9300 / **Europe**:001-703-527-3887

### 2. Hazard(s) identification

#### Classification

**WHMIS 2015 Classification** Classified as hazardous under the Hazardous Products Regulations (SOR/2015-17)

|   |              |
|---|--------------|
| <b>Corrosive to metals</b>                              | Category 1   |
| <b>Acute oral toxicity</b>                              | Category 2   |
| <b>Acute dermal toxicity</b>                            | Category 1   |
| <b>Acute Inhalation Toxicity</b>                        | Category 2   |
| <b>Skin Corrosion/Irritation</b>                        | Category 1 A |
| <b>Serious Eye Damage/Eye Irritation</b>                | Category 1   |
| <b>Specific target organ toxicity (single exposure)</b> | Category 3   |
| Target Organs - Respiratory system.                     |              |

#### Label Elements

**Signal Word**  
Danger

**Hazard Statements**

May be corrosive to metals  
Fatal if swallowed, in contact with skin or if inhaled  
Causes severe skin burns and eye damage  
May cause respiratory irritation



### Precautionary Statements

#### Prevention

Keep only in original container  
Do not breathe dust/fumes/gas/mist/vapours/spray  
Do not get in eyes, on skin, or on clothing  
Wash face, hands and any exposed skin thoroughly after handling  
Do not eat, drink or smoke when using this product  
Use only outdoors or in a well-ventilated area  
Wear protective gloves/protective clothing/eye protection/face protection  
Wear respiratory protection

#### Response

IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower  
IF INHALED: Remove person to fresh air and keep comfortable for breathing  
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing  
Immediately call a POISON CENTER/doctor  
Rinse mouth  
Do NOT induce vomiting  
Wash contaminated clothing before reuse  
Absorb spillage to prevent material damage

#### Storage

Store locked up  
Store in a well-ventilated place. Keep container tightly closed  
Store in corrosive resistant polypropylene container with a resistant inliner  
Store in a dry place

#### Disposal

Dispose of contents/container to an approved waste disposal plant

## 3. Composition/Information on Ingredients

| Component         | CAS-No    | Weight % |
|-------------------|-----------|----------|
| Water             | 7732-18-5 | 94.99    |
| Hydrofluoric acid | 7664-39-3 | 5        |
| Hafnium           | 7440-58-6 | 0.01     |

## 4. First-aid measures

### General Advice

Immediate and specialised first aid and medical treatment is required. Speed is of the essence. Flush with plenty of water immediately. Continue flushing during transport to hospital or medical center.

### Eye Contact

Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

|  |  |
|--|--|
| <b>Skin Contact</b>                    | Wash off immediately with plenty of water for at least 15 minutes. Immediate medical attention is required. Dermal burns may be treated with calcium gluconate gel or slurry in water or glycerine. This compound binds the active fluorides in an insoluble form and limits burn extension and pain. Soaking or immersion with iced 0.13% Benzalkonium chloride solution may be used for skin burns and should be continued until the pain is relieved. Do not use in eyes. |
| <b>Inhalation</b>                      | If not breathing, give artificial respiration. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Remove to fresh air. Immediate medical attention is required. A nebulized solution of 2.5% Calcium gluconate may be administered with Oxygen by inhalation.   |
| <b>Ingestion</b>                       | Do NOT induce vomiting. Call a physician or poison control center immediately.   |
| <b>Most important symptoms/effects</b> | 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 causes severe swelling, severe damage to the delicate tissue and danger of perforation  |
| <b>Notes to Physician</b>              | Treat symptomatically  |

## 5. Fire-fighting measures

|   |   |
|---|---|
| <b>Suitable Extinguishing Media</b>     | Water spray, carbon dioxide (CO <sub>2</sub> ), dry chemical, alcohol-resistant foam. |
| <b>Unsuitable Extinguishing Media</b>   | No information available  |
| <b>Flash Point</b>                      | No information available  |
| <b>Method -</b>                         | No information available  |
| <b>Autoignition Temperature</b>         | No information available  |
| <b>Explosion Limits</b>                 |   |
| <b>Upper</b>                            | No data available   |
| <b>Lower</b>                            | No data available   |
| <b>Sensitivity to Mechanical Impact</b> | No information available  |
| <b>Sensitivity to Static Discharge</b>  | No information available  |

### Specific Hazards Arising from the Chemical

The product causes burns of eyes, skin and mucous membranes. Thermal decomposition can lead to release of irritating gases and vapors.

### Hazardous Combustion Products

Gaseous hydrogen fluoride (HF).

### Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

### NFPA

|               |                     |                    |                         |
|---------------|---------------------|--------------------|-------------------------|
| <b>Health</b> | <b>Flammability</b> | <b>Instability</b> | <b>Physical hazards</b> |
| 4             | 0                   | 1                  | N/A                     |

## 6. Accidental release measures

|   |   |
|---|---|
| <b>Personal Precautions</b>                 | Use personal protective equipment as required. Ensure adequate ventilation. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. |
| <b>Environmental Precautions</b>            | Should not be released into the environment.  |
| <b>Methods for Containment and Clean Up</b> | Soak up with inert absorbent material. Keep in suitable, closed containers for disposal.  |

## 7. Handling and storage

**Handling** Wear personal protective equipment/face protection. Do not get in eyes, on skin, or on clothing. Use only under a chemical fume hood. Do not breathe mist/vapors/spray. Do not ingest. If swallowed then seek immediate medical assistance.

**Storage.** Keep containers tightly closed in a dry, cool and well-ventilated place. Corrosives area. Do not store in metal containers. Incompatible Materials. Metals. Cyanides. Sulfides. Bases. Fluorine.

## 8. Exposure controls / personal protection

### Exposure Guidelines

| Component         | Alberta  | British Columbia                                     | Ontario TWAEV  | Quebec   | ACGIH TLV  | OSHA PEL  | NIOSH IDLH  |
|-------------------|--|--|--|--|--|---|---|
| Hydrofluoric acid | Ceiling: 2 ppm<br>Ceiling: 1.6 mg/m <sup>3</sup><br>TWA: 0.5 ppm<br>TWA: 0.4 mg/m <sup>3</sup><br>TWA: 2.5 mg/m <sup>3</sup> | TWA: 2.5 mg/m <sup>3</sup><br>Ceiling: 2 ppm<br>Skin | TWA: 0.5 ppm<br>TWA: 2.5 mg/m <sup>3</sup><br>CEV: 2 ppm<br>Skin | TWA: 2.5 mg/m <sup>3</sup><br>Ceiling: 3 ppm<br>Ceiling: 2.6 mg/m <sup>3</sup> | TWA: 0.5 ppm<br>TWA: 2.5 mg/m <sup>3</sup><br>Ceiling: 2 ppm<br>Skin | (Vacated) TWA: 3 ppm (Vacated)<br>TWA: 2.5 mg/m <sup>3</sup><br>(Vacated) STEL: 6 ppm<br>TWA: 3 ppm | IDLH: 30 ppm<br>IDLH: 250 mg/m <sup>3</sup><br>TWA: 3 ppm<br>Ceiling: 6 ppm<br>Ceiling: 5 mg/m <sup>3</sup> |
| Hafnium           | TWA: 0.5 mg/m <sup>3</sup>   | TWA: 0.5 mg/m <sup>3</sup>                           | TWA: 0.5 mg/m <sup>3</sup>                                       | TWA: 0.5 mg/m <sup>3</sup>   | TWA: 0.5 mg/m <sup>3</sup>   | (Vacated) TWA: 0.5 mg/m <sup>3</sup><br>TWA: 0.5 mg/m <sup>3</sup>                                  | IDLH: 50 mg/m <sup>3</sup><br>TWA: 0.5 mg/m <sup>3</sup>  |

#### Legend

ACGIH - American Conference of Governmental Industrial Hygienists

OSHA - Occupational Safety and Health Administration

NIOSH IDLH: NIOSH - National Institute for Occupational Safety and Health

### Engineering Measures

Use only under a chemical fume hood. Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location.

Wherever possible, engineering control measures such as the isolation or enclosure of the process, the introduction of process or equipment changes to minimise release or contact, and the use of properly designed ventilation systems, should be adopted to control hazardous materials at source

### Personal protective equipment

#### Eye Protection

Goggles

#### Hand Protection

Protective gloves

| Glove material | Breakthrough time | Glove thickness | Glove comments   |
|----------------|-------------------|-----------------|--|
| Butyl rubber   | > 480 minutes     | 0.35 - 0.7 mm   | As tested under EN374-3                                |
| Neoprene       | > 480 minutes     | 0.55 mm         | Determination of Resistance to Permeation by Chemicals |

Inspect gloves before use. observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. (Refer to manufacturer/supplier for information) gloves are suitable for the task: Chemical compatability, Dexterity, Operational conditions, User susceptibility, e.g. sensitisation effects, also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion. gloves with care avoiding skin contamination.

### Respiratory Protection

When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

To protect the wearer, respiratory protective equipment must be the correct fit and be used and maintained properly

**Recommended Filter type:** Acid gases filter Type E Yellow conforming to EN14387 Particulates filter conforming to EN 143

When RPE is used a face piece Fit Test should be conducted

**Environmental exposure controls**

No information available.

**Hygiene Measures**

Handle in accordance with good industrial hygiene and safety practice.

**9. Physical and chemical properties**

|   |                          |
|---|--------------------------|
| <b>Physical State</b>                         | Liquid                   |
| <b>Appearance</b>                             | Colorless                |
| <b>Odor</b>                                   | pungent                  |
| <b>Odor Threshold</b>                         | No information available |
| <b>pH</b>                                     | < 1.0                    |
| <b>Melting Point/Range</b>                    | -35 °C / -31 °F          |
| <b>Boiling Point/Range</b>                    | 105 °C / 221 °F          |
| <b>Flash Point</b>                            | No information available |
| <b>Evaporation Rate</b>                       | No information available |
| <b>Flammability (solid,gas)</b>               | Not applicable           |
| <b>Flammability or explosive limits</b>       |                          |
| Upper   | No data available        |
| Lower   | No data available        |
| <b>Vapor Pressure</b>                         | No information available |
| <b>Vapor Density</b>                          | 2.21                     |
| <b>Specific Gravity</b>                       | 1.15-1.20                |
| <b>Solubility</b>                             | miscible                 |
| <b>Partition coefficient; n-octanol/water</b> | No data available        |
| <b>Autoignition Temperature</b>               | No information available |
| <b>Decomposition Temperature</b>              | No information available |
| <b>Viscosity</b>                              | No information available |

**10. Stability and reactivity**

|   |   |
|---|---|
| <b>Reactive Hazard</b>                  | None known, based on information available                                  |
| <b>Stability</b>                        | Stable under normal conditions.   |
| <b>Conditions to Avoid</b>              | Incompatible products. Excess heat.   |
| <b>Incompatible Materials</b>           | Metals, Cyanides, Sulfides, Bases, Fluorine                                 |
| <b>Hazardous Decomposition Products</b> | Gaseous hydrogen fluoride (HF)  |
| <b>Hazardous Polymerization</b>         | Hazardous polymerization does not occur.                                    |
| <b>Hazardous Reactions</b>              | Corrosive to metals. Contact with metals may evolve flammable hydrogen gas. |

**11. Toxicological information****Acute Toxicity****Product Information****Oral LD50** Category 2. ATE = 5 - 50 mg/kg.**Dermal LD50** Category 1. ATE < 50 mg/kg.**Vapor LC50** Category 2. ATE = 0.5 - 2 mg/l.**Component Information**

| Component         | LD50 Oral  | LD50 Dermal | LC50 Inhalation              |
|-------------------|------------|-------------|------------------------------|
| Water             | -          | -           | -                            |
| Hydrofluoric acid | Not listed | Not listed  | LC50 = 0.79 mg/L ( Rat ) 1 h |

**Toxicologically Synergistic** No information available

**Products****Delayed and immediate effects as well as chronic effects from short and long-term exposure**

**Irritation** Causes severe burns by all exposure routes

**Sensitization** No information available

**Carcinogenicity** The table below indicates whether each agency has listed any ingredient as a carcinogen.

| Component         | CAS-No    | IARC       | NTP        | ACGIH      | OSHA       | Mexico     |
|-------------------|-----------|------------|------------|------------|------------|------------|
| Water             | 7732-18-5 | Not listed | Not listed | Not listed | Not listed | Not listed |
| Hydrofluoric acid | 7664-39-3 | Not listed | Not listed | Not listed | Not listed | Not listed |
| Hafnium           | 7440-58-6 | Not listed | Not listed | Not listed | Not listed | Not listed |

**Mutagenic Effects** No information available

**Reproductive Effects** No information available.

**Developmental Effects** No information available.

**Teratogenicity** No information available.

**STOT - single exposure** Respiratory system

**STOT - repeated exposure** None known

**Aspiration hazard** No information available

**Symptoms / effects, both acute and delayed** Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated: Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation

**Endocrine Disruptor Information** No information available

**Other Adverse Effects** The toxicological properties have not been fully investigated.

## 12. Ecological information

**Ecotoxicity**

Do not empty into drains. .

| Component         | Freshwater Algae | Freshwater Fish                          | Microtox   | Water Flea                                |
|-------------------|------------------|--|------------|---|
| Hydrofluoric acid | Not listed       | LC50 = 660 mg/L, 48h<br>(Leuciscus idus) | Not listed | EC50 = 270 mg/L, 48h<br>(Daphnia species) |

**Persistence and Degradability** Soluble in water Persistence is unlikely based on information available. Miscible with water

**Bioaccumulation/ Accumulation** No information available.

**Mobility** Will likely be mobile in the environment due to its water solubility.

| Component         | log Pow |
|-------------------|---------|
| Hydrofluoric acid | -1.4    |

## 13. Disposal considerations

**Waste Disposal Methods** Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

| Component                     | RCRA - U Series Wastes | RCRA - P Series Wastes |
|-------------------------------|------------------------|------------------------|
| Hydrofluoric acid - 7664-39-3 | U134                   | -                      |

## 14. Transport information

**DOT**

|                                |                   |
|--------------------------------|-------------------|
| <b>UN-No</b>                   | UN1790            |
| <b>Proper Shipping Name</b>    | HYDROFLUORIC ACID |
| <b>Hazard Class</b>            | 8                 |
| <b>Subsidiary Hazard Class</b> | 6.1               |
| <b>Packing Group</b>           | II                |

**TDG**

|                                |                   |
|--------------------------------|-------------------|
| <b>UN-No</b>                   | UN1790            |
| <b>Proper Shipping Name</b>    | HYDROFLUORIC ACID |
| <b>Hazard Class</b>            | 8                 |
| <b>Subsidiary Hazard Class</b> | 6.1               |
| <b>Packing Group</b>           | II                |

**IATA**

|                                |                   |
|--------------------------------|-------------------|
| <b>UN-No</b>                   | UN1790            |
| <b>Proper Shipping Name</b>    | HYDROFLUORIC ACID |
| <b>Hazard Class</b>            | 8                 |
| <b>Subsidiary Hazard Class</b> | 6.1               |
| <b>Packing Group</b>           | II                |

**IMDG/IMO**

|                                |                   |
|--------------------------------|-------------------|
| <b>UN-No</b>                   | UN1790            |
| <b>Proper Shipping Name</b>    | HYDROFLUORIC ACID |
| <b>Hazard Class</b>            | 8                 |
| <b>Subsidiary Hazard Class</b> | 6.1               |
| <b>Packing Group</b>           | II                |

## 15. Regulatory information

## International Inventories

| Component         | CAS-No    | DSL | NDSL | TSCA | TSCA Inventory notification - Active-Inactive | EINECS    | ELINCS | NLP |
|-------------------|-----------|-----|------|------|---|-----------|--------|-----|
| Water             | 7732-18-5 | X   | -    | X    | ACTIVE  | 231-791-2 | -      | -   |
| Hydrofluoric acid | 7664-39-3 | X   | -    | X    | ACTIVE  | 231-634-8 | -      | -   |
| Hafnium           | 7440-58-6 | X   | -    | X    | ACTIVE  | 231-166-4 | -      | -   |

| Component         | CAS-No    | IECSC | KECL     | ENCS | ISHL | TCSI | AICS | NZIoC | PICCS |
|-------------------|-----------|-------|----------|------|------|------|------|-------|-------|
| Water             | 7732-18-5 | X     | KE-35400 | X    | -    | X    | X    | X     | X     |
| Hydrofluoric acid | 7664-39-3 | X     | KE-20198 | X    | X    | X    | X    | X     | X     |
| Hafnium           | 7440-58-6 | -     | KE-18170 | X    | -    | X    | -    | -     | X     |

**Legend:**

X - Listed '-' - Not Listed

**KECL** - NIER number or KE number (<http://ncis.nier.go.kr/en/main.do>)**DSL/NDSL** - Canadian Domestic Substances List/Non-Domestic Substances List**TSCA** - United States Toxic Substances Control Act Section 8(b) Inventory**EINECS/ELINCS** - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances**IECSC** - Chinese Inventory of Existing Chemical Substances**KECL** - Korean Existing and Evaluated Chemical Substances**ENCS** - Japanese Existing and New Chemical Substances**AICS** - Australian Inventory of Chemical Substances**PICCS** - Philippines Inventory of Chemicals and Chemical Substances**Canada**

SDS in compliance with provisions of information as set out in Canadian Standard - Part 4, Schedule 1 and 2 of the Hazardous Products Regulations (HPR) and meets the requirements of the HPR (Paragraph 13(1)(a) of the Hazardous Products Act (HPA)).

| Component | Canada - National Pollutant Release Inventory (NPRI) | Canadian Environmental Protection Agency (CEPA) - List of Toxic Substances | Canada's Chemicals Management Plan (CEPA) |
|-----------|--|--|---|
|-----------|--|--|---|

|                   |                           |  |  |
|-------------------|---------------------------|--|--|
| Hydrofluoric acid | Part 1, Group A Substance |  |  |
|-------------------|---------------------------|--|--|

**Other International Regulations****Authorisation/Restrictions according to EU REACH**

| Component         | REACH (1907/2006) - Annex XIV - Substances Subject to Authorization | REACH (1907/2006) - Annex XVII - Restrictions on Certain Dangerous Substances | REACH Regulation (EC 1907/2006) article 59 - Candidate List of Substances of Very High Concern (SVHC) |
|-------------------|---|---|---|
| Hydrofluoric acid | -   | Use restricted. See item 75.<br>(see link for restriction details)            | -   |

<https://echa.europa.eu/substances-restricted-under-reach>

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

| Component         | CAS-No    | OECD HPV       | Persistent Organic Pollutant | Ozone Depletion Potential | Restriction of Hazardous Substances (RoHS) |
|-------------------|-----------|----------------|------------------------------|---------------------------|--|
| Water             | 7732-18-5 | Listed         | Not applicable               | Not applicable            | Not applicable                             |
| Hydrofluoric acid | 7664-39-3 | Listed         | Not applicable               | Not applicable            | Not applicable                             |
| Hafnium           | 7440-58-6 | Not applicable | Not applicable               | Not applicable            | Not applicable                             |

| Component         | CAS-No    | Seveso III Directive (2012/18/EC) - Qualifying Quantities for Major Accident Notification | Seveso III Directive (2012/18/EC) - Qualifying Quantities for Safety Report Requirements | Rotterdam Convention (PIC) | Basel Convention (Hazardous Waste) |
|-------------------|-----------|---|--|----------------------------|------------------------------------|
| Water             | 7732-18-5 | Not applicable  | Not applicable   | Not applicable             | Not applicable                     |
| Hydrofluoric acid | 7664-39-3 | Not applicable  | Not applicable   | Not applicable             | Annex I - Y34                      |
| Hafnium           | 7440-58-6 | Not applicable  | Not applicable   | Not applicable             | Not applicable                     |

## 16. Other information

**Prepared By** Regulatory Affairs  
Thermo Fisher Scientific  
Email: EMSDS.RA@thermofisher.com

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**Print Date** 24-December-2021  
**Revision Summary** This document has been updated to comply with the requirements of WHMIS 2015 to align with the Globally Harmonised System (GHS) for the Classification and Labelling of Chemicals.

**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 SDS**