SECTION 1. IDENTIFICATION

Product Identifier: (4N) 99.99% Hafnium Fluoride

Product Code: HF-F-04

CAS Number: 13709-52-9

Relevant identified uses of the substance: Scientific research and development

Supplier details:

American Elements
10884 Weyburn Ave.
Los Angeles, CA 90024
Tel: +1 310-208-0551
Fax: +1 310-208-0351
Emergency telephone number:
+1 800-424-9300

SECTION 2. HAZARDS IDENTIFICATION

Classification of the substance or mixture in accordance with 29 CFR 1910 (OSHA HCS)

GHS06 Skull and crossbones
Acute Tox. 2 H300 Fatal if swallowed.
Acute Tox. 2 H310 Fatal in contact with skin.
Acute Tox. 2 H330 Fatal if inhaled.

GHS05 Corrosion
Skin Corr. 1B H314 Causes severe skin burns and eye damage.
Eye Dam. 1
H318 Causes serious eye damage.

Hazard statements:

No data available
GHS label elements
GHS label elements, including precautionary statements
Hazard pictograms

GHS05 GHS06
Signal word: Danger

Hazard statements
H300+H310+H330 Fatal if swallowed, in contact with skin or if inhaled.
H314
Causes severe skin burns and eye damage.
Precautionary statements
P260
Do not breathe dust/fume/gas/mist/vapors/spray.
P301+P310
IF SWALLOWED: Immediately call a POISON CENTER/ doctor/...
P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P320
Specific treatment is urgent (see on this label).
P361
Take off immediately all contaminated clothing.
P405
Store locked up.
P501
Dispose of contents/container in accordance with local/regional/national/international regulations.
WHMIS classification
D1A - Very toxic material causing immediate and serious toxic effects
D2B - Toxic material causing other toxic effects
E - Corrosive material
Classification system
HMIS ratings (scale 0-4)
(Hazardous Materials Identification System)
Health (acute effects) = 3
Flammability = 0
Physical Hazard = 1
Other hazards
Results of PBT and vPvB assessment
PBT: N/A
vPvB: N/A

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substances
CAS No. / Substance Name:
13709-52-9 Hafnium(IV) fluoride
Identification number(s):
EC number: 237-258-0

SECTION 4. FIRST AID MEASURES

Description of first aid measures
General information
Immediately remove any clothing soiled by the product.
Remove breathing apparatus only after contaminated clothing has been completely removed.
In case of irregular breathing or respiratory arrest provide artificial respiration.
If inhaled:
Supply patient with fresh air. If not breathing, provide artificial respiration. Keep patient warm. 
Seek immediate medical advice. 
In case of skin contact: 
Immediately wash with soap and water; rinse thoroughly. 
Seek immediate medical advice. 
In case of eye contact: 
Rinse opened eye for several minutes under running water. Consult a physician. 
If swallowed: 
Do not induce vomiting; immediately call for medical help. 
Information for doctor 
Most important symptoms and effects, both acute and delayed 
Causes severe skin burns. 
Causes serious eye damage. 
Indication of any immediate medical attention and special treatment needed 
No data available

SECTION 5. FIREFIGHTING MEASURES

Extinguishing media 
Suitable extinguishing agents 
Carbon dioxide, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam. 
Special hazards arising from the substance or mixture 
If this product is involved in a fire, the following can be released: 
Hydrogen fluoride (HF) 
Metal oxide fume 
Advice for firefighters 
Protective equipment: 
Wear self-contained respirator. 
Wear fully protective impervious suit.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures 
Use personal protective equipment. Keep unprotected persons away. 
Ensure adequate ventilation 
Environmental precautions: 
Do not allow product to enter drains, sewage systems, or other water courses. 
Methods and materials for containment and cleanup: 
Use neutralizing agent. 
Dispose of contaminated material as waste according to section 13. 
Ensure adequate ventilation. 
Prevention of secondary hazards: 
No special measures required. 
Reference to other sections 
See Section 7 for information on safe handling 
See Section 8 for information on personal protection equipment. 
See Section 13 for disposal information.
SECTION 7. HANDLING AND STORAGE

Handling
Precautions for safe handling
Handle under dry protective gas.
Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.
Ensure good ventilation at the workplace.
Open and handle container with care.
Information about protection against explosions and fires:
No data available
Conditions for safe storage, including any incompatibilities
Requirements to be met by storerooms and receptacles:
No special requirements.
Information about storage in one common storage facility:
Store away from water/moisture.
Store away from strong bases.
Store away from oxidizing agents.
Further information about storage conditions:
Store under dry inert gas.
This product is moisture sensitive.
Keep container tightly sealed.
Store in cool, dry conditions in well-sealed containers.
Protect from humidity and water.
Specific end use(s)
No data available

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.
Control parameters
Components with limit values that require monitoring at the workplace:
None.
Additional information: No data
Exposure controls
Personal protective equipment
Follow typical protective and hygienic practices for handling chemicals.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Store protective clothing separately.
Avoid contact with the eyes and skin.
Maintain an ergonomically appropriate working environment.
Breathing equipment:
Use self-contained respiratory protective device in emergency situations.
Protection of hands:
Impervious gloves
Inspect gloves prior to use.
Suitability of gloves should be determined both by material and quality, the latter of which may vary by manufacturer.
Penetration time of glove material (in minutes): No data available
Eye protection:
- Tightly sealed goggles
- Full face protection
Body protection:
- Protective work clothing.

**SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**

Information on basic physical and chemical properties
Appearance:
- Form: Powder or solid
- Color: White
Odor: No data available
Odor threshold: No data available.
- pH: N/A
- Melting point/Melting range: No data available
- Boiling point/Boiling range: No data available
- Sublimation temperature / start: No data available
- Flammability (solid, gas): No data available.
- Ignition temperature: No data available
- Decomposition temperature: No data available
- Autoignition: No data available.
- Danger of explosion: No data available.
- Explosion limits:
  - Lower: No data available
  - Upper: No data available
- Vapor pressure: N/A
Density: No data available
Relative density: No data available.
- Vapor density: N/A
- Evaporation rate: N/A
- Solubility in Water (H$_2$O): No data available
- Partition coefficient (n-octanol/water): No data available.
- Viscosity:
  - Dynamic: N/A
  - Kinematic: N/A
- Other information
  - No data available

**SECTION 10. STABILITY AND REACTIVITY**

Reactivity
- No data available
Chemical stability
- Stable under recommended storage conditions.
- Thermal decomposition / conditions to be avoided: Decomposition will not occur if used and stored according to specifications.
- Possibility of hazardous reactions
- Reacts with strong oxidizing agents
- Conditions to avoid
- No data available
Incompatible materials:
Water/moisture
Bases
Oxidizing agents
Hazardous decomposition products:
Hydrogen fluoride
Metal oxide fume

SECTION 11. TOXICOLOGICAL INFORMATION

Information on toxicological effects
Acute toxicity:
Fatal if inhaled.
Fatal in contact with skin.
Fatal if swallowed.
Danger through skin absorption.
Swallowing will lead to a strong corrosive effect on mouth and throat and to the danger of perforation of esophagus and stomach.
LD/LC50 values that are relevant for classification: No data
Skin irritation or corrosion: Causes severe skin burns.
Eye irritation or corrosion: Causes serious eye damage.
Sensitization: No sensitizing effects known.
Germ cell mutagenicity: No effects known.
Carcinogenicity:
No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.
Reproductive toxicity: No effects known.
Specific target organ system toxicity - repeated exposure: No effects known.
Specific target organ system toxicity - single exposure: No effects known.
Aspiration hazard: No effects known.
Subacute to chronic toxicity: No effects known.
Additional toxicological information:
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known

SECTION 12. ECOLOGICAL INFORMATION

Toxicity
Aquatic toxicity:
No data available
Persistence and degradability
No data available
Bioaccumulative potential
No data available
Mobility in soil
No data available
Additional ecological information:
Do not allow undiluted product or large quantities to reach groundwater, water courses, or sewage systems.
Avoid transfer into the environment.
Results of PBT and vPvB assessment
PBT: N/A
SECTION 13. DISPOSAL CONSIDERATIONS

Waste treatment methods
Recommendation
Consult official regulations to ensure proper disposal.
Uncleaned packagings:
Recommendation:
Disposal must be made according to official regulations.

SECTION 14. TRANSPORT INFORMATION

UN-Number
DOT, IMDG, IATA
UN3290
UN proper shipping name
DOT
Toxic solid, corrosive, inorganic, n.o.s. (Hafnium(IV) fluoride)
IMDG, IATA
TOXIC SOLID, CORROSIVE, INORGANIC, N.O.S. (Hafnium(IV) fluoride)
Transport hazard class(es)
DOT
Class
6.1 Toxic substances.
Label
6.1+8
Class
6.1 (TC4) Toxic substances
Label
6.1+8
IMDG, IATA
Class
6.1 Toxic substances.
Label
6.1+8
Packing group
DOT, IMDG, IATA
II
Environmental hazards:
N/A
Special precautions for user
Warning: Toxic substances
EMS Number:
F-A,S-B
Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code
N/A
Transport/Additional information:
DOT
Marine Pollutant (DOT):
No
UN "Model Regulation":
UN3290, Toxic solid, corrosive, inorganic, n.o.s. (Hafnium(IV) fluoride), 6.1 (8), II

SECTION 15. REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture
GHS GHS label elements, including precautionary statements
Hazard pictograms
GHS05
GHS06
Signal word: Danger
Hazard statements
H300+H310+H330 Fatal if swallowed, in contact with skin or if inhaled.
H314
Causes severe skin burns and eye damage.
Precautionary statements
P260
Do not breathe dust/fume/gas/mist/vapors/spray.
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P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P320
Specific treatment is urgent (see on this label).
P361
Take off immediately all contaminated clothing.
P405
Store locked up.
P501
Dispose of contents/container in accordance with local/regional/national/international regulations.
National regulations
This product is not listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical Substance Inventory. Use of this product is restricted to research and development only. This product must be used by or directly under the supervision of a technically qualified individual as defined by TSCA. This product must not be used for commercial purposes or in formulations for commercial purposes.
This product is not listed on the Canadian Domestic Substances List (DSL) or the Canadian Non-Domestic Substances List (NDSL).
SARA Section 313 (specific toxic chemical listings)
Substance is not listed.
California Proposition 65
Prop 65 - Chemicals known to cause cancer
Substance is not listed.
Prop 65 - Developmental toxicity
Substance is not listed.
Prop 65 - Developmental toxicity, female
Substance is not listed.
Prop 65 - Developmental toxicity, male
Substance is not listed.
Information about limitation of use:
For use only by technically qualified individuals.
Other regulations, limitations and prohibitive regulations
Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No. 1907/2006.
Substance is not listed.
The conditions of restrictions according to Article 67 and Annex XVII of the Regulation (EC) No 1907/2006 (REACH) for the manufacturing, placing on the market and use must be observed.
Substance is not listed.
Annex XIV of the REACH Regulations (requiring Authorisation for use)
Substance is not listed.
Chemical safety assessment:
A Chemical Safety Assessment has not been carried out.

16. OTHER INFORMATION

Safety Data Sheet according to Regulation (EC) No. 1907/2006 (REACH). 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 is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. American Elements shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. COPYRIGHT 1997-2019 AMERICAN ELEMENTS. LICENSED GRANTED TO MAKE UNLIMITED PAPER COPIES FOR INTERNAL USE ONLY.