

Occupational Safety and Health (Classification, Labelling and Safety Data Sheet of Hazardous Chemicals) Regulations 2013

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING
Product Identifier

Perihal Produk: **Hafnium(IV) fluoride**
 Product Description: **Hafnium(IV) fluoride**
 Cat No. : 45061
 CAS No 13709-52-9
 Molecular Formula F4 Hf

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

Recommended Use Laboratory chemicals.
 Uses advised against No Information available

Company

Thermo Fisher Scientific Fisher Scientific (M) Sdn Bhd
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 Main line: +60 3-5525 7888

Supplier

E-mail address Enquiry.my@thermofisher.com

Emergency Telephone Number

Tel: +03-5525 7888
 CHEMTREC Malaysia **1-800-815-308** (Malay)
 CHEMTREC Malaysia (Kuala Lumpur) **+(60)-327884561** (Malay)

SECTION 2: HAZARDS IDENTIFICATION
Classification of the substance or mixture

| | |
|---------------------------|---------------------|
| Skin Corrosion/Irritation | Category 1 B (H314) |
|---------------------------|---------------------|

Label Elements

Signal Word
Danger
Hazard Statements

H314 - Causes severe skin burns and eye damage

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Precautionary Statements

Prevention

P264 - Wash face, hands and any exposed skin thoroughly after handling

P280 - Wear protective gloves/protective clothing/eye protection/face protection

Response

P301 + P330 + P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting

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

P304 + P340 - IF INHALED: Remove person to fresh air and keep 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

P310 - Immediately call a POISON CENTER or doctor

P362 + P364 - Take off contaminated clothing and wash it before reuse

Storage

P403 - Store in a well-ventilated place

Disposal

P501 - Dispose of contents/ container to an approved waste disposal plant

Other Hazards

EUH032 - Contact with acids liberates very toxic gas

This product does not contain any known or suspected endocrine disruptors

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

| Component | CAS No | Weight % |
|-----------------------|------------|----------|
| Hafnium tetrafluoride | 13709-52-9 | 98 |

SECTION 4: FIRST AID MEASURES

Description of first aid measures

Eye Contact

Immediate medical attention is required. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.

Skin Contact

Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Immediate medical attention is required.

Ingestion

Do NOT induce vomiting. Call a physician immediately.

Inhalation

Remove from exposure, lie down. Remove to fresh air. If not breathing, give artificial respiration. Immediate medical attention is required.

Self-Protection of the First Aider

Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination.

Most important symptoms and effects, both acute and delayed

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.

Indication of any immediate medical attention and special treatment needed

Notes to Physician

Treat symptomatically.

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SECTION 5: FIREFIGHTING MEASURES

Extinguishing media

Suitable Extinguishing Media

Carbon dioxide (CO₂). Dry chemical. Chemical foam.

Extinguishing media which must not be used for safety reasons

No information available.

Special hazards arising from the substance or mixture

Thermal decomposition can lead to release of irritating gases and vapors.

Hazardous Combustion Products

Gaseous hydrogen fluoride (HF).

Advice for fire-fighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

Ensure adequate ventilation.

Environmental precautions

See Section 12 for additional Ecological Information.

Methods and Material for Containment and Cleaning Up

Avoid dust formation. Sweep up and shovel into suitable containers for disposal. Do not let this chemical enter the environment.

Reference to Other Sections

Refer to protective measures listed in Sections 8 and 13.

SECTION 7: HANDLING AND STORAGE

Precautions for Safe Handling

Do not breathe dust. Do not get in eyes, on skin, or on clothing. Do not ingest. If swallowed then seek immediate medical assistance. Handle product only in closed system or provide appropriate exhaust ventilation.

Conditions for Safe Storage, Including any Incompatibilities

Keep in a dry, cool and well-ventilated place. Keep container tightly closed. Corrosives area. Keep containers tightly closed in a dry, cool and well-ventilated place.

Specific End Uses

Use in laboratories.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

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Control Parameters

| Component | Malaysia | ACGIH TLV | OSHA PEL |
|-----------------------|----------|---|--------------------------------------|
| Hafnium tetrafluoride | | TWA: 2.5 mg/m ³ TWA: 0.5 mg/m ³ | (Vacated) TWA: 2.5 mg/m ³ |

| Component | European Union | The United Kingdom | Germany |
|-----------------------|----------------|--------------------|---|
| Hafnium tetrafluoride | | | TWA: 1 mg/m ³ (8 Stunden). AGW - exposure factor 4 TWA: 1 mg/m ³ (8 Stunden). MAK Haut |

Exposure Controls

Engineering Measures

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

Skin and body protection

Wear appropriate protective gloves and clothing to prevent skin exposure

Inspect gloves before use.

Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves.

(Refer to manufacturer/supplier for information)

Ensure gloves are suitable for the task: Chemical compatibility, 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.

Remove gloves with care avoiding skin contamination.

Respiratory Protection

When workers are facing concentrations above the exposure limit they must use appropriate certified respirators

Recommended Filter type:

Particulates filter conforming to EN 143

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

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

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice

Environmental exposure controls

No information available

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance

White

Physical State

Powder Solid

Odor

No information available

Odor Threshold

No data available

pH

No information available

Melting Point/Range

No data available

Softening Point

No data available

Boiling Point/Range

No information available

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| | | |
|---|--------------------------|-----------------------------------|
| Flash Point | No information available | Method - No information available |
| Evaporation Rate | Not applicable | Solid |
| Flammability (solid,gas) | No information available | |
| Explosion Limits | No data available | |
| Vapor Pressure | No information available | |
| Vapor Density | Not applicable | Solid |
| Specific Gravity / Density | No data available | |
| Bulk Density | No data available | |
| Water Solubility | No information available | |
| Solubility in other solvents | No information available | |
| Partition Coefficient (n-octanol/water) | | |
| Autoignition Temperature | No data available | |
| Decomposition Temperature | No data available | |
| Viscosity | Not applicable | Solid |
| Explosive Properties | No information available | |
| Oxidizing Properties | No information available | |
| Molecular Formula | F4 Hf | |
| Molecular Weight | 254.48 | |

SECTION 10: STABILITY AND REACTIVITY

Reactivity

Yes.

Chemical Stability

Stable.

Possibility of Hazardous Reactions

| | |
|--------------------------|---------------------------|
| Hazardous Polymerization | No information available. |
| Hazardous Reactions | No information available. |

Conditions to Avoid

Avoid dust formation. Incompatible products.

Incompatible Materials

Acids. Strong oxidizing agents.

Hazardous Decomposition Products

Gaseous hydrogen fluoride (HF).

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SECTION 11: TOXICOLOGICAL INFORMATION

Information on Toxicological Effects

Product Information No acute toxicity information is available for this product

(a) acute toxicity;

| | |
|------------|-------------------|
| Oral | No data available |
| Dermal | No data available |
| Inhalation | No data available |

(b) skin corrosion/irritation; Category 1 B

(c) serious eye damage/irritation; No data available

(d) respiratory or skin sensitization;

| | |
|-------------|-------------------|
| Respiratory | No data available |
| Skin | No data available |

(e) germ cell mutagenicity; No data available

(f) carcinogenicity; No data available

There are no known carcinogenic chemicals in this product

(g) reproductive toxicity; No data available

(h) STOT-single exposure; No data available

(i) STOT-repeated exposure; No data available

Target Organs No information available.

(j) aspiration hazard; Not applicable
Solid

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

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 Disrupting Properties Assess endocrine disrupting properties for human health. This product does not contain any known or suspected endocrine disruptors.

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity effects Do not empty into drains.

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| | |
|--|---|
| <u>Persistence and degradability</u> <u>Degradability</u> | No information available Not relevant for inorganic substances. |
| <u>Bioaccumulative potential</u> | No information available |
| <u>Mobility in soil</u> | No information available. |
| <u>Endocrine Disruptor Information</u> | This product does not contain any known or suspected endocrine disruptors |
| <u>Other adverse effects</u> | No information available |

SECTION 13: DISPOSAL CONSIDERATIONS

| | |
|--|---|
| <u>Waste treatment methods</u> <u>Waste from Residues/Unused Products</u> | Waste is classified as hazardous Dispose of in accordance with the European Directives on waste and hazardous waste Dispose of in accordance with local regulations |
| <u>Contaminated Packaging</u> | Dispose of this container to hazardous or special waste collection point. |
| <u>Other Information</u> | Waste codes should be assigned by the user based on the application for which the product was used Do not empty into drains Do not flush to sewer Large amounts will affect pH and harm aquatic organisms |

SECTION 14: TRANSPORT INFORMATION

| | |
|--|---|
| <u>IMDG/IMO</u> | |
| UN-No | UN3260 |
| Hazard Class | 8 |
| Packing Group | III |
| Proper Shipping Name | Corrosive solid, acidic, inorganic, n.o.s. |
| <u>Road and Rail Transport</u> | |
| UN-No | UN3260 |
| Hazard Class | 8 |
| Packing Group | III |
| Proper Shipping Name | Corrosive solid, acidic, inorganic, n.o.s. |
| <u>IATA</u> | |
| UN-No | UN3260 |
| Hazard Class | 8 |
| Packing Group | III |
| Proper Shipping Name | CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S.* |
| <u>Special Precautions for User</u> | No special precautions required |

SECTION 15: REGULATORY INFORMATION

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

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International Inventories

X = listed

| Component | EINECS | TSCA | DSL | PICCS | ENCS | ISHL | IECSC | AICS | KECL |
|-----------------------|-----------|------|-----|-------|------|------|-------|------|------|
| Hafnium tetrafluoride | 237-258-0 | - | - | - | - | - | - | - | - |

National Regulations

Persistent Organic Pollutant
Ozone Depletion Potential

This product does not contain any known or suspected substance
This product does not contain any known or suspected substance

SECTION 16: OTHER INFORMATION

Legend

CAS - Chemical Abstracts Service

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

PICCS - Philippines Inventory of Chemicals and Chemical Substances

IECSC - Chinese Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

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

ENCS - Japanese Existing and New Chemical Substances

AICS - Australian Inventory of Chemical Substances

NZIoC - New Zealand Inventory of Chemicals

WEL - Workplace Exposure Limit

ACGIH - American Conference of Governmental Industrial Hygienists

RPE - Respiratory Protective Equipment

LC50 - Lethal Concentration 50%

POW - Partition coefficient Octanol:Water

TWA - Time Weighted Average

IARC - International Agency for Research on Cancer

LD50 - Lethal Dose 50%

EC50 - Effective Concentration 50%

ADR - European Agreement Concerning the International Carriage of Dangerous Goods by Road

IMO/MDG - International Maritime Organization/International Maritime Dangerous Goods Code

OECD - Organisation for Economic Co-operation and Development

BCF - Bioconcentration factor

ICAO/IATA - International Civil Aviation Organization/International Air Transport Association

MARPOL - International Convention for the Prevention of Pollution from Ships

ATE - Acute Toxicity Estimate

VOC - (Volatile Organic Compound)

Key literature references and sources for data

<https://echa.europa.eu/information-on-chemicals>

Suppliers safety data sheet, Chemadvisor - LOLI, Merck index, RTECS

Prepared By

Revision Date

Revision Summary

Health, Safety and Environmental Department

26-Mar-2025

Not applicable.

In accordance with local and national regulations: Occupational Safety and Health (Classification, Labelling and Safety Data Sheet of Hazardous Chemicals) Regulations 2013

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

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materials or in any process, unless specified in the text

End of Safety Data Sheet