Chemical Safety Data Sheet MSDS / SDS

Hafnium SDS

Revision Date:2024-04-25 Revision Number:1

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

Product identifier

Product name: Hafnium

CAS: 7440-58-6

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

Relevant identified uses: For R&D use only. Not for medicinal, household or other use.

Uses advised against: none

Company Identification

Company: Chemicalbook.in

Address: 5 vasavi Layout Basaveswara Nilayam Pragathi Nagar Hyderabad, India -500090

Telephone: +91 9550333722

SECTION 2: Hazards identification

Classification of the substance or mixture

Pyrophoric solids, Category 1

GHS label elements, including precautionary statements

Pictogram(s)

Signal word Danger

Hazard statement(s)

H250 Catches fire spontaneously if exposed to air

Precautionary statement(s)

Prevention

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P222 Do not allow contact with air.
P233 Keep container tightly closed.
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...

Response

P302+P335+P334 IF ON SKIN: Brush off loose particles from skin. Immerse in cool water [or wrap in wet bandages].
P370+P378 In case of fire: Use ... to extinguish.

Storage

none

Disposal

none

Other hazards which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

Substance

Chemical name: Hafnium

Common names and synonyms:	Hafnium
CAS number:	7440-58-6
EC number:	231-166-4
Concentration:	100%

SECTION 4: First aid measures

Description of necessary first-aid measures

If inhaled

Fresh air, rest.

Following skin contact

Rinse contaminated clothes (fire hazard) with plenty of water. Remove contaminated clothes. Rinse and then wash skin with water and soap.

Following eye contact

Rinse with plenty of water (remove contact lenses if easily possible).

Following ingestion

Rinse mouth.

Most important symptoms/effects, acute and delayed

Excerpt from ERG Guide 135 [Substances - Spontaneously Combustible]: Fire will produce irritating, corrosive and/or toxic gases. Inhalation of decomposition products may cause severe injury or death. Contact with substance may cause severe burns to skin and eyes. Runoff from fire control may cause pollution. (ERG, 2016)

Indication of immediate medical attention and special treatment needed, if necessary

Absorption, Distribution and Excretion

Hafnium can be absorbed into the body by inhalation of its aerosol.

SECTION 5: Firefighting measures

Suitable extinguishing media

If material on fire or involved in fire: Use suitable dry powder. ... Use dry chemical or carbon dioxide. ... Use water only if flooding quantities are available. Hafnium powder, dry

Specific hazards arising from the chemical

Excerpt from ERG Guide 135 [Substances - Spontaneously Combustible]: Flammable/combustible material. May ignite on contact with moist air or moisture. May burn rapidly with flare-burning effect. Some react vigorously or explosively on contact with water. Some may decompose explosively when heated or involved in a fire. May re-ignite after fire is extinguished. Runoff may create fire or explosion hazard. Containers may explode when heated. (ERG, 2016)

Special protective actions for fire-fighters

Use special powder, dry sand, water in large amounts.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Remove all ignition sources. Evacuate danger area! Consult an expert! Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Wet powder to prevent dusting and ignition. Sweep spilled substance into covered water-filled containers. Then store and dispose of according to local regulations. Do NOT wash away into sewer. Do NOT absorb in saw-dust or other combustible absorbents.

Environmental precautions

Remove all ignition sources. Evacuate danger area! Consult an expert! Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Wet powder to prevent dusting and ignition. Sweep spilled substance into covered water-filled containers. Then store and dispose of according to local regulations. Do NOT wash away into sewer. Do NOT absorb in saw-dust or other combustible absorbents.

Methods and materials for containment and cleaning up

Persons not wearing protective equipment and clothing should be restricted from areas of spills until cleanup has been completed. 1. Ventilate area of spill. 2. Collect spilled material in most convenient and safe manner and deposit in sealed containers for reclamation, or for disposal in secured sanitary landfill. Liq containing hafnium...should be absorbed in vermiculite, dry sand, earth, or similar material.

SECTION 7: Handling and storage

Precautions for safe handling

NO open flames, NO sparks and NO smoking. Do NOT expose to friction or shock. Closed system, dust explosion-proof electrical equipment and lighting. Prevent deposition of dust. Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

Conditions for safe storage, including any incompatibilities

Fireproof. Separated from strong oxidants, strong acids and halogens. Keep under inert gas. Store only in original container.Storage: Store hafnium in a fireproof area. Keep it separate from strong oxidizing agents, strong bases, halogens, phosphorus, and sulfur. Keep stored under water.

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

TLV: 0.5 mg/m3, as TWA

Biological limit values

no data available

Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Wear safety spectacles.

Skin protection

Protective gloves.

Respiratory protection

Avoid inhalation of dust. Use closed system.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state:	Hafnium powder, dry, is a grayish metallic colored powder. Dust from dry powder may be ignited by static electricity. The dry powder reacts with moisture to produce hydrogen, a flammable gas. The heat from this reaction may be sufficient to ignite the hydrogen. It does not appreciably react with large quantities of water.
Colour:	Gray crystals
Odour:	no data available
Melting point/freezing point:	2227°C(lit.)
Boiling point or initial boiling point and boiling range:	4602°C(lit.)
Flammability:	Explosive in powder form (either dry or with <25% water); finely divided powder can be ignited by static electricity or even SPONTANEOUSLY.
Lower and upper explosion limit/flammability limit:	no data available
Flash point:	no data available
Auto-ignition temperature:	20 deg C for dust cloud
Decomposition temperature:	no data available
pH:	no data available

Kinematic viscosity:	no data available
Solubility:	Insoluble (NIOSH, 2016)
Partition coefficient n-octanol/water:	no data available
Vapour pressure:	0 mm Hg (approx) (NIOSH, 2016)
Density and/or relative density:	13.3g/cm3(lit.)
Relative vapour density:	no data available
Particle characteristics:	no data available

SECTION 10: Stability and reactivity

Reactivity

Recommended Exposure Limit: 50 mg/cu m (as Hf)
The substance may ignite spontaneously on contact with air. May decompose on shock, friction or concussion. May explode on heating. Reacts violently with halogens, strong acids and strong oxidants. This generates explosion hazard.

Chemical stability

no data available

Possibility of hazardous reactions

The substance may spontaneously ignite on contact with air and at higher temperatures with nitrogen, phosphorous and sulphur. /Hafnium powder, wet or dry/Dust explosion possible if in powder or granular form, mixed with air.Metals, such as HAFNIUM METAL(reactivity similar to zirconium), are reducing agents and tend to react with oxidizing agents. Their reactivity is strongly influenced by their state of subdivision: in bulk they often resist chemical combination; in powdered form they may react very rapidly. Thus, as a bulk metal it is somewhat unreactive, but finely divided material may be pyrophoric. The metal reacts exothermically with compounds having active hydrogen atoms (such as acids and water) to form flammable hydrogen gas and caustic products. The reactions are less vigorous than the similar reactions of alkali metals, but the released heat can still ignite the released hydrogen. Materials in this group may react with azo/diazo compounds to form explosive products. These metals and the

products of their corrosion by air and water can catalyze polymerization reactions in several classes of organic compounds; these polymerizations sometimes proceed rapidly or even explosively. Some metals in this group form explosive products with halogenated hydrocarbons.

Conditions to avoid

no data available

Incompatible materials

Although /hafnium/ is relatively inert, when powdered it becomes very reactive. The dry powder may react explosively at elevated temperatures with nitrogen, phosphorus, oxygen, sulfur and other non-metals. The halogens react similarly, and in contact with hot concentrated nitric acid and other oxidants it may explode (often after a delay with nitric acid). The powder is pyrophoric and readily ignitable by friction, heat or static sparks, and if dry burns fiercely. Presence of water (5-10%) slightly reduces the ease of ignition, but combustion of the damp powder proceeds explosively (the oxygen content of water, 89%, being much higher than that of air).

Hazardous decomposition products

May explosively decompose on shock, friction, or concussion. Hafnium powder

SECTION 11: Toxicological information

Acute toxicity

Oral: no data available

Inhalation: no data available

Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

no data available

Reproductive toxicity

no data available

STOT-single exposure

no data available

STOT-repeated exposure

no data available

Aspiration hazard

no data available

SECTION 12: Ecological information

Toxicity

Toxicity to fish: no data available

Toxicity to daphnia and other aquatic invertebrates: no data available

Toxicity to algae: no data available

Toxicity to microorganisms: no data available

Persistence and degradability

no data available

Bioaccumulative potential

no data available

Mobility in soil

no data available

Other adverse effects

no data available

SECTION 13: Disposal considerations

Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

SECTION 14: Transport information

UN Number

ADR/RID: UN2545 (For reference only, please check.)
IMDG: UN2545 (For reference only, please check.)
IATA: UN2545 (For reference only, please check.)

UN Proper Shipping Name

ADR/RID: HAFNIUM POWDER, DRY (For reference only, please check.)
IMDG: HAFNIUM POWDER, DRY (For reference only, please check.)
IATA: HAFNIUM POWDER, DRY (For reference only, please check.)

Transport hazard class(es)

ADR/RID: 4.2 (For reference only, please check.)
IMDG: 4.2 (For reference only, please check.)
IATA: 4.2 (For reference only, please check.)

Packing group, if applicable

ADR/RID: I (For reference only, please check.)
IMDG: I (For reference only, please check.)
IATA: I (For reference only, please check.)

Environmental hazards

ADR/RID: No
IMDG: No
IATA: No

Special precautions for user

no data available

Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product in question

European Inventory of Existing Commercial Chemical Substances (EINECS)

Listed.

EC Inventory

Listed.

United States Toxic Substances Control Act (TSCA) Inventory

Listed.

China Catalog of Hazardous chemicals 2015

Listed.

New Zealand Inventory of Chemicals (NZIoC)

Not Listed.

(PICCS)

Listed.

Vietnam National Chemical Inventory

Listed.

IECSC)

Not Listed.

Korea Existing Chemicals List (KECL)

Listed.

SECTION 16: Other information

Abbreviations and acronyms

CAS: Chemical Abstracts Service

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

RID: Regulation concerning the International Carriage of Dangerous Goods by Rail

IMDG: International Maritime Dangerous Goods

IATA: International Air Transportation Association

TWA: Time Weighted Average

STEL: Short term exposure limit

LC50: Lethal Concentration 50%

LD50: Lethal Dose 50%

EC50: Effective Concentration 50%

References

IPCS - The International Chemical Safety Cards (ICSC), website: http://www.ilo.org/dyn/icsc/showcard.home

HSDB - Hazardous Substances Data Bank, website: https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm

IARC - International Agency for Research on Cancer, website: http://www.iarc.fr/

eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en

CAMEO Chemicals, website: http://cameochemicals.noaa.gov/search/simple

ChemIDplus, website: http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp

ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: http://www.phmsa.dot.gov/hazmat/library/erg

Germany GESTIS-database on hazard substance, website: http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp

ECHA - European Chemicals Agency, website: https://echa.europa.eu/

Other Information

Insufficient data are available on the effect of this substance on human health, therefore utmost care must be taken.Powder is normally handled wetted with no less than 25% of water to reduce the fire and explosion risk. UN number 2545 is for dry powder, according to the specification of the powder Packing Group can be either I, II, or III. The GHS classification will also vary according to the specification of the powder. Other UN number is: 1326 HAFNIUM POWDER, WETTED with not less than 25% water; class 4.1; packing group: II.