

Material Safety Data Sheet

Identity: Hafnium boride

Formula: HfB₂

SECTION I - GENERAL INFORMATION

Manufacturer: [Stanford Advanced Materials](#) (SAM)

The information below is believed to be accurate and represents the best information available to SAM. However, SAM makes no warranty, expressed or implied with respect to such information and we assume no liability resulting from its use.

SECTION II - PRODUCT INFORMATION/HAZARDOUS INGREDIENTS

Hafnium boride, powder and pieces.

Synonyms: Hafnium boride, Hafnium diboride

Chemical Family: Metal boride

Molecular Formula: HfB₂

Molecular Weight: 200.11

HMIS Rating (0-4): Health: 2

Flammability: 0 Reactivity: 0

HMIS Protective Equipment: F: Glasses, gloves, apron, dust mask

| Hazardous Components | CAS # | OSHA PEL | ACGIH TLV | OTHER | % |
|----------------------|------------|-------------------------|-------------------------|-------|-------|
| Hafnium boride | 12007-23-7 | .5mg(Hf)/m ³ | .5mg(Hf)/m ³ | NE | 100.0 |

| CAS # | Sec. 302 (EHS) | Sec. 304 | Sec. 313 |
|------------|----------------|----------|----------|
| 12007-23-7 | No | No | No |

SECTION III - PHYSICAL AND CHEMICAL CHARACTERISTICS

Boiling Point: NE or NA

Specific Gravity (water =1): 10.5

Melting Point: 3100.0 deg C

Vapor Pressure: NA

Physical States: Solid

Vapor Density: NA

Solubility in Water: Insoluble

Percent Volatile: NA

Appearance and Odor: Gray powder and pieces, no odor.

SECTION IV - FIRE AND EXPLOSION DATA

Flash Point: NE or NA Method Used: Non-flammable

Explosive Limits: LEL: NA UEL: NA

Extinguishing Media: Use: NA Use suitable extinguishing media for surrounding materials and type of fire.

Special Fire Fighting Procedures: Firefighters must wear full-face, self-contained breathing apparatus with full protective clothing to prevent contact with skin and eyes. Fumes from fire are hazardous. Isolate runoff to prevent environmental pollution.

Unusual Fire and Explosion Hazards: When hafnium boride comes in contact with acids, it may emit flammable hydrogen gas and volatile boranes.

SECTION V - HEALTH HAZARD DATA

Routes of Entry: Inhalation: Yes Skin: Yes Ingestion: Yes Eyes: Yes Other: No

Health Hazards (acute and chronic):

To the best of our knowledge the chemical, physical, and toxicological properties of hafnium boride have not been thoroughly investigated and recorded.

Hafnium is a poison by an unspecified route. It is poorly soluble in water and thus is not absorbed in water and thus is not absorbed efficiently by ingestion. Many hafnium compounds are poisons.

Boron compounds are very toxic and therefore considered an industrial poison. Boron is one of a group of elements, such as lead, manganese, arsenic, which affects the nervous system. Boron poisoning causes depression of the circulation, persistent vomiting and diarrhea, followed by profound shock and coma. The temperature becomes subnormal and a scarletina form rash may cover the entire body. (Sax, Dangerous Properties of Industrial Materials, eight edition)

Inhalation:

Acute: May be a nuisance dust. May cause mild irritation to the nose, throat and mucous membranes.

Chronic: No chronic health effects recorded.

Ingestion:

Acute: May cause boron poisoning.

Chronic: No chronic health effects recorded.

Skin:

Acute: May cause irritation.

Chronic: May cause dermatitis.

Eye:

Acute: Dust may cause irritation.

Chronic: No chronic health effects recorded.

Target organs: May affect the central nervous system.

Carcinogenicity: NTP: N IARC Monographs: N OSHA Regulated: N

Recommended Exposure Limits: See Section "II" LD50/LC50: No toxicity data recorded.

Signs and Symptoms of Exposure:

Inhalation: May cause sneezing, coughing and a dry throat.

Ingestion: Boron poisoning may cause: depression of circulation, vomiting, diarrhea, shock and coma.

Skin: May cause itching, and redness.

Eye: May cause itching, redness and watering.

Medical Conditions Generally Aggravated by Exposure: Pre-existing lung disorders.

Emergency and First Aid Procedures:

Inhalation: Remove victim to fresh air; keep warm and quiet; give oxygen if breathing is difficult and seek medical attention.

Ingestion: Seek 1 – 2 glasses of milk or water and induce vomiting; keep warm and quiet; seek medical attention. Never give anything by mouth or induce vomiting to an unconscious person.

Skin: Remove contaminated clothing; brush material off skin; wash affected area with mild soap and water; seek medical attention if irritation persists.

Eye: Flush eyes with lukewarm water, lifting upper and lower eyelids, for at least 15 minutes. Seek medical attention if irritation persists.

SECTION V – REACTIVITY DATA

Stability: Stable

Conditions to Avoid – Instability: None

Incompatibility (Materials to Avoid): Strong acids, bases and oxidizing agents.

Hazardous Decomposition or byproducts: Hydrogen gas and boranes.

Hazardous Polymerization: Will not occur.

Conditions to Avoid – Hazardous Polymerization: None

SECTION VI – PRECAUTIONS FOR SAFE HANDLING AND USE

Steps To Be Taken In Case Material Is Released Or Spilled: Wear appropriate respiratory and protective equipment specified in Section VIII-control

measures. Isolate spill area and provide ventilation. Vacuum up spill using a high efficiency particulate absolute (HEPA) air filter and place in a closed container for proper disposal. Take care not to raise dust.

Waste disposal method: Dispose of in accordance with local, state and federal regulations.
Health Label Information: Store in cool, dry area. Store in tightly closed container. Wash thoroughly after handling.

Precautions to be taken in Handling and Storing: None

Other Precautions: None

SECTION VIII – CONTROL MEASURES

Protective Equipment Summary – Health Hazard Information: NIOSH approved respirator. Impervious gloves. Safety glasses. Clothes to prevent skin contact.

Respiratory Protection (Specify Type):

Ventilation: Local Exhaust: To maintain concentrations at or below the PEL, TLV

Special: Handle in a controlled process

Mechanical (Gen): Recommended. Other:

None

Protective Gloves: Rubber Gloves Eye Protection: Safety glasses.

Other protective Clothing or Equipment: Protective gear suitable to prevent contamination.

Work/Hygienic/Maintenance Practices: Implement engineering and work practice controls to reduce and maintain concentration of exposure at low levels. Use good housekeeping and sanitation practices. Do not use tobacco or food in work area. Wash thoroughly before eating and smoking. Do not blow dust off clothing or skin with compressed air.