

Material Safety Data Sheet

Identity: Ytterbium fluoride

Formula: YbF₃

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 assumes no liability resulting from its use.

SECTION II - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

Molecular Weight: 230.04

Chemical Family: Metal halide

CAS #	OSHA PEL	ACGIH TLV	%
13760-80-0	2.5mg (F)/m ³	2.5mg (F)/m ³	100%

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

Physical States: Solid

Boiling Point: 2200.0 °C
1157.0 °C

Rate: NA

Solubility in water: Insoluble

Vapor Pressure: NA Melting Point:

Vapor Density: NA Evaporation

Specific Gravity (water=1): NE

Appearance and odor: Gray to white powder and pieces, no odor

SECTION IV - FIRE AND EXPLOSION HAZARD DATA:

Flash Point: NA

Extinguishing Media:

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 heated to decomposition or comes in contact with acids/acid fumes. Ytterbium fluoride may emit toxic fumes of fluorine, hydrogen fluoride vapors and fluorine gas.

Ytterbium fluoride is hygroscopic.

SECTION V - REACTIVITY DATA

Stability: Stable

Conditions to Avoid: None

Incompatibility – Materials to avoid: Acids

Hazardous Decomposition or Byproducts: Fumes of fluorine, hydrogen fluoride, fluorine gas and oxides of Ytterbium.

Hazardous Polymerization: Will not occur

SECTION VI - HEALTH HAZARD DATA

Routes of entry: Inhalation? Yes Skin? Yes Eyes? Yes Ingestion? Yes

Health Hazards (Acute and Chronic):

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

Ytterbium is considered a rare earth metal. These metals are moderately to highly toxic. The symptoms of toxicity of the rare earth elements include writing ataxia, labored respiration, walking on the toes with arched back and sedation. The rare earth elements exhibit low toxicity by ingestion exposure. However, the intraperitoneal route is highly toxic while the subcutaneous route is poison to moderately toxic. The production of skin and lung granulomas after exposure to them requires extensive protection to prevent such exposure.

Inorganic fluorides are generally highly irritating and toxic. Chronic fluorine poisoning, or “fluorosis”, occurs among miners of cryol consists of sclerosis of the bones, cause be fixation of the calcium by fluorine. There may also be some calcification of ligaments. The teeth are mottled, and there is osteosclerosis and ostemalacia. Large doses can cause very severe nausea, vomiting, and diarrhea; aggravate attacks of asthma and severe bone changes, making normal movements painful. Some signs of pulmonary fibrosis are noted. Some enzyme system effects are reported. Irritants to the eyes, skin and mucous membranes. Loss of weight, anorexia, anemia, wasting and cachexia and dental defects are among the common findings in chronic fluorine poisoning. There may be an eosinophilia and impairment of growth in young workers. Symptoms of intoxication include gastric, intestinal, circulatory, respiratory and nervous complaints and rashes. (Sax, Dangerous Properties of Industrial Materials, eighth edition).

Inhalation:

Acute: May cause irritation to the respiratory tract and mucous membrane. Dusts may cause asthma attacks and lung damage such as lung granulomas and pulmonary edema. Large doses may cause immediate defecation, writing, loss of muscle coordination, labored respiration, sedation, hypotension, dyspnea, hyperemia, lover edema and necrosis, portal congestion, pleural effucion and granulamatous peritoritis with serouse and hemorrhagic ascites, respiratory and cardiac failure.

Chronic: May cause fluorosis, pulmonary fibrosis, severe bone changes, hyperemia, cellular eosinophilia and vascular vascular granulomata, acute chemical pneumonitis, Subacute bronchitis and focal hypertopic emphysema.

Ingestion:

Acute: May cause irritation, rashes and skin granulomas.

Chronic: May affect renal and hepatic functions, the coagulations rate of the blood, circulatory, enzyme and nervous system.

Skin:

Acute: May cause irritation, rashes and skin granulomas.

Chronic: May cause dermatitis, sensitivity to heat, itching and skin lesions.

Eye:

Acute: May cause irritation.

Chronic: No chronic health effects recorded.

Target Organ: May affect the skeleton, kidneys, central nervous system, liver, respiratory system, skin.

Carcinogenicity: NTP? No IARC Monographs? No OSHA Regulated? No, RECOMMENDED.

SIGNS AND SYMPTOMS OF EXPOSURE:

Inhalation: Fibrosis may cause: sclerosis of the bones, calcification of ligaments, mottled teeth, osteosclerosis, and ostemalacia, loss of weight, anorexia, anemia, wasting, cachia and dental defects.

Ingestion: May cause nausea, vomiting, diarrhea, abdominal burning and cramp-like pain.

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 VII - PRECAUTIONS FOR SAFE HANDLING AND USE
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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, 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 state, local, and federal regulations.

Hazard Label Information:

Store tightly sealed container in a cool, dry area. Wash thoroughly after handling.

Other:

Ytterbium fluoride is hygroscopic. Handle and store in an inert gas such as argon.

SECTION VIII - CONTROL MEASURES

Protective Equipment Summary (Hazard Label Information):

NIOSH/MSHA approved respirator, impervious gloves, safety goggles, and clothes to prevent skin contact.

Ventilation:

Local Exhaust: To maintain concentration at below PEL, TUV.

Special: Handle in an inert atmosphere.

Respiratory Protection (Specify Type):

Use only NIOSH/MESA approved equipment – filter-dust, fume and mist.

Protective Gloves:

Neoprene, PVC, and butyl gloves.

Eye/Face Protection:

Safety glasses.

Other Protective Equipment:

Sufficient to prevent contact. Emergency eyewash and safety shower.

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 or smoking. Do not blow dust off clothing or skin with compressed air.

Please be advised that N/A can either mean Not Applicable or No Data Has Been Established
