

## ***Material Safety Data Sheet***

Identity: Zirconium fluoride

Formula: ZrF<sub>4</sub>

### 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

Form Weight: 167.21

CAS #	OSHA PEL	ACGIH TLV	%
7783-64-4	2.5mg(F)/m <sup>3</sup>	2.5mg(F)/m <sup>3</sup>	0-100%

### SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

Physical States: Solid

Boiling Point: N/A

Vapor Pressure (vs. air or mmHg): N/A

Melting Point: 600.00 °C

Vapor Density: N/A

Evaporation Rate: N/A

Flash Point: N/A

Solubility in water: Soluble in cold, decomposes in hot

Specific Gravity: 4.6 at 16.0 °C

*Appearance and odor:* White powder and pieces, no odor

### SECTION IV - FIRE AND EXPLOSION HAZARD DATA:

*Method Used:* Non-Flammable

Explosive Limits: LEL: N/A

UEL: N/A

*Extinguishing Media:*

Use suitable extinguishing agent for surrounding material 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, zirconium fluoride may emit toxic fumes of fluorine. When exposed to high temperatures and the presence of humid air, toxic and corrosive hydrogen fluoride fumes may be released.

SECTION V - REACTIVITY DATA

*Stability:* Unstable

*Conditions to Avoid (stability):* Protect from moisture and water.

*Incompatibility:* none recorded

*Hazardous Polymerization:* Will not occur

*Hazardous Decomposition or by products:* Fumes fluorine, hydrogen fluoride and zirconium oxide.

*Conditions to Avoid (hazardous polymerization):* None

SECTION VI - HEALTH HAZARD DATA

*Signs and Symptoms of Overexposure:*

*Inhalation:* May cause ulcers and of the upper respiratory tract, excessive salivation, vomiting, thirst, sweating, colic and diarrhea.

*Ingestion:* May cause nausea, vomiting, diarrhea, abdominal burning, cramp-like pain, as tiff spine, calcification of ligaments of the ribs and pelvis.

*Skin:* May cause redness, itching and chemical burns.

*Eye:* May cause redness, itching and watering and chemical burns.

*Health Hazards (Acute and Chronic):*

*Inhalation:*

*Acute:* Severe irritant and corrosive to respiratory tract and mucous membranes.

*Chronic:* May cause fluorine poisoning pulmonary edema and sever bone changes.

*Ingestion:*

*Acute:* Severe irritant and corrosive. May cause gastrointestinal irritation, nausea, and diarrhea.

*Chronic:* May affect the circulatory, enzyme and nervous system.

*Skin:*

*Acute:* May cause rashes and skin granulomas.

*Chronic:* Severe irritant corrosive.

*Eye:*

*Acute:* May cause irritation, watering, itching and/or swelling.

*Chronic:* Severe irritant and corrosive.

*Target Organ:* May affect skeleton, kidneys, central nervous system, respiratory system, eyes and skin.

*Carcinogenicity:* NTP? No IARC Monographs? No OSHA Regulated? No

*Medical Conditions Aggravated by Exposure:* May cause or aggravate attacks of asthma.

*Emergency and First Aid Procedures:*

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

*Ingestion:* Give 1-2 glasses of milk or water and induce vomiting, seek medical attention. Never induce vomiting or give anything by mouth to an unconscious person.

*Skin:* Remove contaminated clothing, brush material off skin, wash affected area with mild soap and water, and seek medical attention immediately.

*Eye:* Flush eyes with lukewarm water, lifting upper and lower eyelids for at least 15 minutes and seek medical attention immediately.

SECTION VII - 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, 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 in cool, dry area and in tightly sealed container. Wash thoroughly after handling.

SECTION VIII - CONTROL MEASURES

*Protective Equipment Summary (Hazard Label Information):*

NIOSH approved respirator, impervious butyl gloves, safety glasses, clothes to prevent contact.

*Ventilation:*

Local Exhaust: To maintain concentration at low exposure levels.

Mechanical (General): Recommended.

*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