

PRODUCT NAME: ZIRCONIUM ORTHOSULFATE SOLUTION -
ZIRCONIUM HYDROXYSULFATE SOLUTION

Transportation Emergencies, Call (800) 424-9300 (CHEMTREC)
Health Emergencies, contact Your Local Poison Center

Caution: Causes irritation. Avoid contact with skin, eyes or clothing.

I. PRODUCT INFORMATION

Product Name: Zirconium Orthosulfate Solution **Formula:** $Zr(OH)_x (SO_4)_{2-0.5x}$
Zirconium Hydroxysulfate Solution
Chemical Name: Zirconium Sulfate Solution
CAS Number: 14644-61-2

| Typical Composition | CAS #'s | % |
|----------------------------|----------------|----------|
| Zirconium Basic Sulfate | 84583-91-5 | 40-60% |
| Sulfuric Acid | 7664-93-9 | 10-20% |
| Water | 7732-18-5 | Balance |

NOTE: Hafnium is naturally occurring in zirconium ore. Commercial grade zirconium contains from 1 to 3% hafnium. Zirconium sulfate is included in the CERCLA list (5,000 lb. RQ). Inventories of this product in excess of the Threshold Planning Quantity (TPQ) must be reported under SARA Title III, Section 311 & 312.

Exposure Standard: The ACGIH has established a TLV for zirconium of $5\text{mg}/\text{m}^3$. OSHA has established a PEL of $5\text{mg}/\text{m}^3$ for zirconium. The STEL is $10\text{mg}/\text{m}^3$. The ACGIH has established a TLV for hafnium of $0.5\text{mg}/\text{m}^3$. OSHA has established a PEL of $0.5\text{mg}/\text{m}^3$ for hafnium oxide.

Hazard Ratings: Health = 2 Flammability = 0 Reactivity = 1
0 = Least; 1 = Slight; 2 = Moderate; 3 = High; 4 = Extreme;

II. PERSONAL PROTECTION INFORMATION

Ventilation: Use with local exhaust ventilation sufficient to minimize exposure below PEL/TLV exposure limits.

Eye: Chemical goggles and face shield.

Skin: Rubber or neoprene gloves

Respiratory: Use NIOSH approved "PAPRD/SA:CF" or better respirator for concentrations at or above PEL and TLV. For concentrations below PEL and TLV, NIOSH approved "DM" or better mask are recommended.

Other: Long sleeve shirt and long pants to cover entire body where exposure will be prolonged or repeated. Safety shoes recommended.

Work/Hygienic Practices:

Do not use unless eye bath and safety shower are available in the work area. Wash hands before eating, drinking, smoking, or using restroom. Use good housekeeping practices.

III. HEALTH INFORMATION**PHYSIOLOGICAL & HEALTH EFFECTS****Routes of Entry:**

- Eyes:** Corrosive to eyes.
- Skin:** Causes irritation, local swelling and redness
- Inhalation:** Vapors are irritating and harmful
- Ingestion:** Corrosive to digestive tract
- Toxicity:** LD50 in rats 3.5g/kg orally
- Carcinogenicity:** Ingredients not listed on NTP.
Ingredients not listed in IARC monographs.

EMERGENCY & FIRST AID PROCEDURES

- Eyes:** Immediately flush eyes in clear running water for at least 15 minutes lifting upper and lower lids periodically. Get medical attention immediately.
- Skin:** Flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. If irritation results, seek medical attention. Wash clothing before reuse. Discard shoes.
- Inhalation:** Remove victim to fresh air. If breathing is difficult, administer oxygen. If breathing has stopped, administer artificial respiration or cardiopulmonary resuscitation. If breathing does not return to normal within a few minutes, get medical attention immediately.
- Ingestion:** Do not induce vomiting. Give limewater or milk of magnesia. If these are not available, give large quantities of water. Avoid alcohol. Never give anything by mouth to an unconscious person. Get medical attention immediately.

SYMPTOMS OF OVEREXPOSURE

- Eyes:** Solutions are corrosive to eye tissue and cause severe pain.
- Skin:** Irritating and painful
- Inhalation:** Repeated and prolonged exposure may result in respiratory irritation, pulmonary injury or disease. NOTE: The risk of chronic pulmonary injury or disease is increased for individuals who smoke.

Ingestion: Causes severe irritation of the mouth and throat, abdominal pain, vomiting and diarrhea.

IV. REACTIVITY DATA

Stability: Heating will liberate H₂SO₄ mist and SO₃ gas.

Conditions To Avoid: Exposure to heat

Incompatibility: Avoid contact with combustible materials, carbides, chlorates, nitrates, fulminates, picrates, metallic powders, sulfides, strong reducing agents, or strong alkalis.

Hazardous Decomposition

Products: SO₃ gas

Hazardous Polymerization: Will not occur.

V. PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor: Colorless solution

Boiling Point: 101°C

Freezing Point: 5°F - 20°F

Melting Point: 410°C; with decomposition [This data is for the compound Zr(SO₄)₂.]

Vapor Density (air = 1): Heavier than air

Vapor Pressure (mm Hg & Temp): Less than 450 mmHg at 30°C

Solubility: Miscible in water.

Specific Gravity (H₂O =1): 1.40 –1.60 g/ml

pH: <1.0

Molecular Weight: Not applicable for solution

VI. SPECIAL PRECAUTIONS

Handling and Storage

Precautions: Store upright in a cool, dry, well ventilated area. Avoid contact with water. Keep containers closed at all times when not in use. Avoid contamination. See section on incompatibility data.

VII. FIRE PROTECTION INFORMATION

Flash Point: None

Flammable Limits: Not flammable

Extinguishing Media: Use extinguishing media suitable to surrounding fire.

Special Firefighting Procedures:

This solution is acidic and corrosive to skin, eyes, mucous membranes. Fire fighters should wear self-contained breathing apparatus and full protective clothing when fighting fires in the area of this material.

Unusual Fire and

Explosion Hazards: This product is not flammable but when strongly heated it will emit corrosive and irritating fumes. This product is corrosive. Cool containers with water spray. Avoid contact with the solution and avoid breathing the fumes or mists.

VIII. TRANSPORTATION REQUIREMENTS

DOT Proper Shipping Name: Corrosive Liquid, Acidic, Inorganic, n.o.s. (Zirconium Sulfate Solution)

DOT Classification: 8

UN/NA Identification Number: UN3264

Packing Group: II

Additional DOT Labels Required: Corrosive

IX. SPILL AND LEAK PROCEDURES

Precaution if

Spilled or Released: Spills in excess of 10,200 lbs must be reported under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 and SARA Title III, Section 304.

Stay upwind of large spills. Provide mechanical ventilation when possible. Personnel cleaning up spills should wear self-contained breathing apparatus. Full waterproof disposal is required in an approved hazard waste site according to federal, state, and local regulations. Area should be neutralized with soda ash or lime solutions. Neutralized solutions should be collected for disposal.

Neutralizing Chemicals: Soda ash or slaked lime

**Waste Disposal
Methods:**

Dispose in an approved hazardous waste site in accordance with applicable federal, state, and local regulations.

**Reportable
Quantities:**

5,000 lbs of zirconium sulfate.

SALES OFFICE

For Product Information:
TEL: 662-494-3055
FAX: 662-494-2828

Post Office Drawer 1217
West Point, MS 39773

To Place An Order:
TEL: 800-953-3585
FAX: 800-953-3588

IMPORTANT

The information on this Material Safety Data Sheet is believed to be accurate but is not warranted to be so. Protective equipment, health effects, and other related safety measures are based on intended and anticipated product use. Recipients are advised to confirm in advance of need that the information is applicable and suitable to their circumstances.