Praxair™ Material Safety Data Sheet

1. Chemical Product and Company Identification

Product Name:	Zinc Sulfate Solution (MSDS No. P-6207)	**Trade Name:**	Zinc Sulfate Solution
Chemical Name:	Zinc Sulfate	**Synonyms:**	Acid zinc sulfate, white vitrol, white copperas, zinc vitrol
Formula:	$ZnSO_3\ 7H_2O$	**Chemical Family:**	Not Applicable
Telephone:	**Emergencies:** 1-800-645-4633* **CHEMTREC** 1-800-424-9300* Routine: 1-800-PRAXAIR	**Company Name:**	Praxair, Inc. 39 Old Ridgebury Road Danbury CT 06810-5113

Call emergency numbers 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product. For routine information contact your supplier, Praxair sales representative, or call 1-800-PRAXAIR (1-800-772-9247).

2. Composition / Information on Ingredients

INGREDIENT NAME	CAS NUMBER	PERCENTAGE	OSHA PEL	ACGIH TLV-TWA
Zinc Sulfate	7446-20-0	>99%	None currently established	None currently established

**The symbol ">" means "greater than."*

3. Hazards Identification

EMERGENCY OVERVIEW

DANGER! Corrosive liquid and vapor.
Harmful if inhaled or swallowed.
Causes eye, skin, and respiratory tract burns.
May cause liver and kidney damage.
Self-contained breathing apparatus may be required by rescue workers.
Odor: None

THRESHOLD LIMIT VALUE: None currently established.

EFFECTS OF A SINGLE (ACUTE) OVEREXPOSURE:

INHALATION–Vapor irritates the lungs and upper respiratory tract, producing coughing, wheezing, shortness of breath, and pulmonary edema (fluid in the lungs). Chemical burns may cause permanent damage to mouth, throat, bronchial, and lung tissues.

SKIN CONTACT–Irritates the skin and causes chemical burns.

SWALLOWING–Irritates and causes chemical burns of the mouth, esophagus and stomach. Causes nausea, vomiting, and stomach cramps, and diarrhea. Increased pulse rate may or may not be accompanied by hypotension (low blood pressure). Excessive movement may be observed. Large doses may cause internal bleeding, organ damage, and death.

EYE CONTACT–Irritates the eyes and conjunctival tissue. chemical burns may result in permanent eye injury.

EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE: Fatigue, impaired reflexes, intestinal inflammation accompanied by bloody diarrhea, low white cell count, anemia, depression of central nervous system functions, tremors, paralysis of extremities.

OTHER EFFECTS OF OVEREXPOSURE: Ingestion has produced tumors and reproductive toxicity in laboratory animals. See section 11, Toxicological Information.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: None known.

SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION: See section 11.

CARCINOGENICITY: Zinc Sulfate is not listed by NTP, OSHA, or IARC.

4. First Aid Measures

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, qualified personnel may give oxygen. Call a physician.

SKIN CONTACT: Immediately remove contaminated clothing. Shower with plenty of water, rinsing away all material, then wash thoroughly with soap and water. See a physician for treatment of reddened or blistered skin.

SWALLOWING: Have a conscious and alert victim drink two glasses of water or milk to dilute solution. Never give anything by mouth to an unconscious, convulsive, or unresponsive person. Call a physician.

EYE CONTACT: Immediately flush eyes thoroughly with warm water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. See a physician, preferably an ophthalmologist, immediately.

NOTES TO PHYSICIAN: *If vomiting does not occur spontaneously, gastric lavage may be indicated, but consider the possibility of chemical ulceration prior to nasogastric intubation.*

5. Fire Fighting Measures

FLASH POINT (test method)	Not applicable	**AUTOIGNITION TEMPERATURE**	Not applicable	
FLAMMABLE LIMITS IN AIR, % by volume	**LOWER**	Not applicable	**UPPER**	Not applicable

EXTINGUISHING MEDIA: Zinc Sulfate cannot catch fire. Use media appropriate for surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES:
DANGER! Corrosive liquid and vapor. Immediately evacuate all personnel from danger area. Toxic fumes may be given off when zinc sulfate is heated to decomposition. Wear self-contained breathing apparatus with full facepiece, operated in the pressure demand mode, and full protective clothing when participating in firefighting and rescue activities. Do not allow runoff to drain into sewers and waterways. On-site fire brigades must comply with OSHA 29 CFR 1910.156.

UNUSUAL FIRE AND EXPLOSION HAZARDS: At high temperatures, sealed containers of zinc sulfate may rupture as material decomposes. Toxic fumes may result from thermal decomposition. (See section 10.)

HAZARDOUS COMBUSTION PRODUCTS: Not applicable.

6. Accidental Release Measures

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:
DANGER! Corrosive liquid and vapor. Immediately evacuate all personnel from danger area. Wear suitable respiratory protection and protective clothing. (See section 8.) Avoid spreading dust or mist during cleanup. Cover spilled liquid with soda ash or sodium bicarbonate. Scoop up slurry and place in a suitable disposal container.

WASTE DISPOSAL METHOD: Prevent waste from contaminating the surrounding environment. Keep personnel away. Discard any product, residue, disposable container or liner in an environmentally acceptable manner, in full compliance with federal, state, and local regulations. If necessary, call your local supplier for assistance.

7. Handling and Storage

PRECAUTIONS TO BE TAKEN IN STORAGE: Store in a dry, well ventilated area in moisture-tight containers resistant to acid corrosion. Keep containers tightly closed.

PRECAUTIONS TO BE TAKEN IN HANDLING: Handle and use only with appropriate personal protective equipment. (See section 8.) Keep containers tightly closed when not in use.

8. Exposure Controls/Personal Protection

VENTILATION/ENGINEERING CONTROLS:

LOCAL EXHAUST–Use a local or general exhaust system to minimize vapor concentrations. Local ventilation is preferred to control contamination at its source.
MECHANICAL (general)–Acceptable.
SPECIAL–Not applicable
OTHER–Not applicable

RESPIRATORY PROTECTION: None required under normal conditions if ventilation is adequate. If airborne concentrations are high or when handling bulk quantities of the material wear suitable respiratory protection. The respiratory protection used must conform with OSHA rules as specified in 29 CFR 1910.134.

SKIN PROTECTION: Wear chemically protective gloves, gauntlets, boots, and aprons, as appropriate, to prevent prolonged or repeated skin contact. Rubber gloves are recommended. Select in accordance with OSHA 29 CFR 1910.132 and 1910.133

EYE PROTECTION: Safety glasses or protective goggles. Select in accordance with OSHA 29 CFR 1910.133.

OTHER PROTECTIVE EQUIPMENT: Select in accordance with OSHA 29 CFR 1910.132 and 1910.133. Regardless of protective equipment, never touch live electrical parts.

9. Physical and Chemical Properties

MOLECULAR WEIGHT: 161.43	EXPANSION RATIO: Not applicable
SPECIFIC GRAVITY (H2O=1): At 39.2°F (4°C) and 1 atm: 3.74	SOLUBILITY IN WATER: Soluble
DENSITY: At 39.2°F (4°C) and 1 atm: 122.99 lb/ft3 (1.97 g/cm3)	VAPOR PRESSURE: AT 68°F (20°C): Not applicable
PERCENT VOLATILES BY VOLUME: 0	EVAPORATION RATE (Butyl Acetate=1): Not applicable
BOILING POINT (1 atm): Not applicable.	pH: <7; solution is acidic.
MELTING POINT (1 atm): 212°F (100°C). Loses 7H2O at 536°F (280°C); decomposes into sulfur and zinc oxides at 1364°F (740°C).	
APPEARANCE, ODOR, AND STATE: Liquid solution of colorless, odorless crystals, granules, or powder. Metallic taste.	

10. Stability and Reactivity

STABILITY:	**Unstable**		**Stable**	X

INCOMPATIBILITY (materials to avoid): None known.

HAZARDOUS DECOMPOSITION PRODUCTS: Zinc oxide fumes, sulfur dioxide fumes

HAZARDOUS POLYMERIZATION:	**May Occur**		**Will Not Occur**	X

CONDITIONS TO AVOID: Elevated temperatures

11. Toxicological Information

LD_{Lo}, oral, rat—2200 mg/kg.

12. Ecological Information

Zinc Sulfate does not contain any Class I or Class II ozone-depleting chemicals. Zinc Sulfate is not listed as a marine pollutant by DOT.

13. Disposal Considerations

WASTE DISPOSAL METHOD: Do not attempt to dispose of residual or unused quantities. Contact your supplier. Also see section 6 for disposal following spills.

14. Transport Information

DOT/IMO SHIPPING NAME: Corrosive liquid, n.o.s. (zinc sulfate)	**HAZARD CLASS:** 8
IDENTIFICATION NUMBER: UN 1760	**PRODUCT RQ:** 1000 lbs

SHIPPING LABEL(s): CORROSIVE

PLACARD (When required): CORROSIVE

SPECIAL SHIPPING INFORMATION: None

15. Regulatory Information

The following selected regulatory requirements may apply to this product. Not all such requirements are identified. Users of this product are solely responsible for compliance with all applicable federal, state, and local regulations.

U.S. FEDERAL REGULATIONS:

EPA (Environmental Protection Agency)

CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (40 CFR Parts 117 and 302):

Reportable Quantity (RQ): 1000 lbs

SARA: Superfund Amendment and Reauthorization Act:

- **SECTIONS 302/304:** Require emergency planning based on Threshold Planning Quantity (TPQ) and release reporting based on Reportable Quantities (RQ) of extremely hazardous substances (40 CFR Part 355):

  Threshold Planning Quantity (TPQ): None
  Extremely Hazardous Substances (40 CFR 355): None

- **SECTIONS 311/312:** Require submission of Material Safety Data Sheets (MSDSs) and chemical inventory reporting with identification of EPA hazard categories. The hazard categories for this products are as follows:

IMMEDIATE:	Yes	PRESSURE:	No
DELAYED:	Yes	REACTIVITY:	No
		FIRE:	No

- **SECTION 313:** Requires submission of annual reports of release of toxic chemicals that appear in 40 CFR Part 372.

  Zinc Sulfate does not require reporting under this section.

40 CFR 68: Risk Management Program for Chemical Accidental Release Prevention**:** Requires development and implementation of risk management programs at facilities that manufacture, use, store, or otherwise handle regulated substances in quantities that exceed specified thresholds.

Zinc Sulfate is not listed as a regulated substance.

TSCA: Toxic Substances Control Act: Zinc Sulfate is listed on the TSCA inventory.

OSHA (OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION):

29 CFR 1910.119 : Process Safety Management of Highly Hazardous Chemicals: Requires facilities to develop a process safety management program based on Threshold Quantities (TQ) of highly hazardous chemicals.

Zinc Sulfate is not listed in Appendix A as a highly hazardous chemical.

STATE REGULATIONS:

CALIFORNIA: This product is not listed by California under the Safe Drinking Water Toxic Enforcement Act of 1986 (Proposition 65).

PENNSYLVANIA: This product is subject to the Pennsylvania Worker and Community Right-To-Know Act (35 P.S. Sections 7301-7320).

16. Other Information

Be sure to read and understand all labels and instructions supplied with all containers of this product.

SPECIAL PRECAUTIONS: ***Corrosive Liquid and Vapor.*** Use only with adequate ventilation or respiratory protection. (See section 8.) Have safety showers and eyewash fountains immediately available to exposed workers. Use only with materials compatible with zinc sulfate. (See section 10.) If possible, use only in a closed system. ***Do not eat, drink, or smoke*** in areas where zinc sulfate is used or stored. Wash hands and face thoroughly to clean them of any residual zinc sulfate before eating, drinking, smoking, using the toilet, or applying cosmetics.

MIXTURES: When you mix two or more chemicals, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist, or other trained person when you evaluate the end product. Remember, gases and liquids have properties that can cause serious injury or death.

HAZARD RATING SYSTEMS:

NFPA RATINGS:		**HMIS RATINGS:**	
HEALTH	= 1	HEALTH	= 1
FLAMMABILITY	= 0	FLAMMABILITY	= 0
REACTIVITY	= 0	REACTIVITY	= 0
SPECIAL	None		

Praxair asks users of this product to study this Material Safety Data Sheet (MSDS) and become aware of product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents and contractors of the information on this MSDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information.

The opinions expressed herein are those of qualified experts within Praxair, Inc. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and the conditions of use of the product are not within the control of Praxair, Inc., it is the user's obligation to determine the conditions of safe use of the product.

Praxair MSDSs are furnished on sale or delivery by Praxair or the independent distributors and suppliers who package and sell our products. To obtain current Praxair MSDSs for these products, contact your Praxair sales representative or local distributor or supplier. If you have questions regarding Praxair MSDSs, would like the form number and date of the latest MSDS, or would like the names of the Praxair suppliers in your area, phone or write the Praxair Call Center (**Phone:** 1-800-PRAXAIR; **Address:** Praxair Call Center, Praxair, Inc., PO Box 44, Tonawanda, NY 14150-7891).

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