# ZINC SULFATE MONOHYDRATE MATERIAL SAFETY DATA SHEET

## SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

**Product Identity** : Zinc Sulfate Monohydrate

**Manufacturer:** : M/s. Jai Shree Rasayan Udyog Ltd;
M-4, Aradhana Bhawan, Azadpur,
Commercial Complex, New Delhi-33,
Ph: +91-11-4575 0100 – 0140
Fax: +91-11-4575 0140

**Product Uses** : (1) The mining industry uses zinc sulfate as a flotation agent in the processing of zinc/lead and zinc/copper ores.
(2) The animal feed and fertilizer industries use zinc sulfate as a zinc micronutrient.
(3) The cattle industry uses zinc sulfate as a fungicide in hoof bath solutions. Sales for agricultural applications may require appropriate registration and labelling.

## SECTION 2. COMPOSITION / INFORMATION ON INGREDIENTS

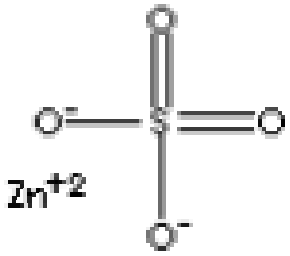
| **Ingredient** | Approximate Percent by Weight | CAS Number : |
|---|---|---|
| Zinc Sulfate Monohydrate | 92% | 7446-19-7 |
| Manganese Sulfate | 1.5% | 7785-87-7 |

**Occupational Exposure Limits**

| LD50/LC50 | Species and Route |
|---|---|
| 15 mg/m3 / 5 mg/m3* | None established |
| LD50, oral, rat 1710 mg/kg | |
| 5 mg/m3 (Ceiling) | |
| 0.2 mg/m³ (as Mn) | |
| 1 mg/m3 (as Mn) | |
| 3 mg/m3 STEL (as Mn) | |
| LD50, oral, rat 2150 mg/kg | |

**Zinc Sulphate Monohydrate Specifications:**

| | | |
|---|---|---|
| **Formula** | **:** | **ZnSO4.H20** |
| **Molecular Weight** | **:** | **179.45** |
| **CAS No.** | **:** | **7446-19-7** |
| **Appearance** | **:** | **White free flowing powder, soluble in water, slightly soluble in alcohol, insoluble in acetone** |
| **Assay (as ZnS04.H20)** | **:** | **98% Min** |
| **Purity as Zinc (Zn)** | **:** | **33.5% Min** |
| **Arsenic (As)** | **:** | **10 ppm Max** |
| **Lead (Pb)** | **:** | **20 ppm Max** |
| **Cadmium (Cd)** | **:** | **20 ppm Max** |
| **Mercury (Hg)** | **:** | **1 ppm Max** |
| **Water Insoluble** | **:** | **0.05% Max** |
| **Iron (Fe)** | **:** | **200 ppm Max** |
| **Particle Size** | **:** | **97% less than 250µ** |
| **Standard Packaging** | **:** | **25 kg PP. bags** |
| **Structural Formula** | **:** | |




**SECTION 3. HAZARDS IDENTIFICATION**

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| Emergency Overview | : Colorless, odorless granules. Not flammable or explosive, but will decompose in extreme heat to produce toxic sulphur oxide gas and zinc oxide fume. The granular solid or dust is relatively non-toxic to humans and poses little immediate hazard to emergency response personnel but is freely soluble in water and can pose a threat to watercourses. |
| Potential Health Effects | : May irritate eyes, skin and respiratory tract. If dusty it may cause breathing difficulty and irritation of mucous membranes. Ingestion may cause strong stomach cramps and diarrhea and may induce spontaneous vomiting. Chronic |

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| | health hazards include stomach irritation, abdominal cramps and nausea. Zinc sulfate monohydrate is not considered a carcinogen by OSHA, NTP, IARC, ACGIH or the EU. |
| Potential Environmental Effects | : This product is highly water soluble and is toxic to fish and other aquatic life. It can also be toxic to plant life and other terrestrial organisms at elevated concentrations in soils (see Ecological Information, Section 12). |

**SECTION 4. FIRST AID MEASURES**

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| Eye Contact | : Do not allow victim to rub eye(s). Let the eye(s) water naturally for a few minutes. If particle/dust does not dislodge, flush with lukewarm, gently flowing water for 5 minutes or until particle/dust is removed, while holding eyelid(s) open. If irritation persists, obtain medical attention. DO NOT attempt to manually remove anything stuck to the eye. |
| Skin Contact | : Remove contaminated clothing, shoes and leather goods (e.g. watchbands, belts). Quickly and gently blot or brush away excess chemical. Wash gently and thoroughly with lukewarm gently flowing water and non-abrasive soap for 5 minutes. If irritation persists, repeat flushing. Obtain medical advice. Completely decontaminate clothing, shoes and leather goods before reuse or else discard. |
| Inhalation | : If symptoms are experienced, remove source of contamination or move victim to fresh air. Obtain medical advice. |
| Ingestion | : Never give anything by mouth if victim is rapidly losing consciousness, or is unconscious or convulsing. Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. Have victim drink 2 – 8 oz. (60 – 240 ml) of water. Zinc sulfate is an emetic and may cause vomiting. If vomiting occurs naturally, have victim rinse mouth with water again. Obtain medical advice and bring a copy of this MSDS. |

**SECTION 5. FIRE FIGHTING MEASURES**

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| Fire and Explosion Hazards | : Zinc sulfate does not burn or support combustion. |

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| Extinguishing Media | : Use any means of extinction appropriate for the surrounding fire conditions such as water spray, carbon dioxide, dry chemical, or foam. |
| Fire Fighting | : Toxic fumes of sulfur dioxide may result from combustion. As with any fire, fire fighters should be fully trained and wear full protective clothing including an approved, self-contained breathing apparatus which supplies a positive air pressure within a full facepiece mask. Do not use water directly on material. Do not allow water run-off to enter sewers or watercourses. |
| Flashpoint and Method | : Not Applicable. |
| Upper and Lower Flammable Limit | : Not Applicable. |
| Autoignition Temperature | : Not Applicable. |

**SECTION 6. ACCIDENTAL RELEASE MEASURES**

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| Procedures for Cleanup | : Stop release if possible to do so safely. Contain spill, isolate hazard area, and deny entry. Sweep up or vacuum. Place contaminated material in suitable, labeled containers for final disposal. Dispose of waste material consistent with the requirements of waste disposal authorities. |
| Personal Precautions | : Gloves and coveralls or other protective clothing are recommended for persons responding to an accidental release (see also Section 8). Close-fitting safety goggles may be necessary in some circumstances to prevent eye contact. |
| Environmental Precautions | : This product can pose a threat to the environment. Contamination of soil and water should be prevented. Keep spillage and runoff from storage areas from entering soil, streams or sewers. |

**SECTION 7. HANDLING AND STORAGE**

Store in cool, dry, well-ventilated area away from incompatible substances. Protect from physical damage. It is good practice to keep container closed when not in use. Avoid generating dust and the release of dust into the workplace. Good housekeeping is important to prevent accumulations of dust. Always practice good personal hygiene. Refrain from eating, drinking, or smoking in work areas.

## SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

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| Protective Clothing | : The hazard potential of this material is low. Where there is large scale use of this material and significant potential for worker contact, gloves and long sleeved work clothes or disposable coveralls may be necessary. Eye protection should be worn where dust is generated and there is a potential that eye contact may occur. |
| Ventilation | : Use adequate local or general ventilation where necessary to maintain the concentrations of zinc sulfate dust well below the recommended occupational exposure limits for general Particulates, Not Otherwise Specified (PNOS). |
| Respirators | : Where dust or fumes are generated and cannot be controlled to within acceptable levels by engineering means, use appropriate NIOSH-approved respiratory protection equipment (a 42CFR84 Class N, R or P-95 particulate filter cartridge). |

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

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| Appearance: | Colorless, odorless granules |
| Odor: | None |
| Physical State: | Solid |
| pH: | 5.0 @ 10% solution<br>4.5 @ saturated solution |
| Vapor Pressure: | Negligible @ 20°C |
| Vapor Density: | Not Applicable |
| Boiling Point/Range: | Not Applicable |
| Freezing/Melting Point/Range: | Loses water at 238°C<br>Decomposes at 680°C |
| Specific Gravity: | 3.28 |
| Evaporation Rate: | Not Applicable |
| Coefficient of Water/Oil Distribution: | Log p(oct) = -0.07 (estimated) |
| Odor Threshold: | Not Applicable |
| Solubility in Water: | 53.8 g/100 ml at 20 °C<br>89.5 g/100 ml at 100°C |

## SECTION 10. STABILITY AND REACTIVITY

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| Stability and Reactivity | : This material is stable and not considered |

reactive under normal temperatures and pressures. Hazardous polymerization or runaway reactions will not occur.

Incompatibilities : None have been identified to date. Avoid excessive heating that may lead to decomposition of the material.

Hazardous Decomposition Products : High temperature operations such as oxy-acetylene cutting, electric arc welding or severe overheating will generate zinc oxide fume which, on inhalation in sufficient quantity, can produce metal fume fever. Under such conditions, sulfur dioxide will also be generated and can cause respiratory distress.

**SECTION 11. TOXICOLOGICAL INFORMATION**

General : In the form in which this product is sold it is relatively non-toxic. The major route of exposure would be through the generation and inhalation of airborne dust and especially the generation of zinc oxide fume through thermal decomposition.

Acute:

Skin/Eye : Direct contact may cause local irritation of the eyes or skin but would not cause tissue damage. Eye contact with solutions (>1%) may cause the appearance of white flecks on the lens of the eye. Dust or fume from burning or welding operations may also cause local irritation.

Inhalation : Acute inhalation may result in irritation but is not expected to cause significant harmful effects. Symptoms may include discomfort, coughing, tingling sensation, sneezing and/or shortness of breath and wheezing. Extreme heating of zinc sulfate monohydrate will generate zinc oxide fume. If inhaled, this fume can result in the condition called metal fume fever. The symptoms of metal fume fever will occur within 3 to 10 hours of exposure, and include immediate dryness and irritation of the throat, tightness of the chest, and coughing which may later be followed by flu-like symptoms of fever, malaise, perspiration, frontal headache, muscle cramps, low back pain, occasionally blurred vision, nausea, and vomiting. The symptoms are temporary and generally disappear, without medical intervention,

within 24 to 48 hours of onset. There are no recognized complications, after affects, or chronic affects that result from this condition.

Ingestion : Ingestion of large doses can cause anemia and stomach symptoms. Zinc sulfate is very astringent, and when ingested in excessive quantities, can irritate the stomach, resulting in abdominal pain, nausea, diarrhea and spontaneous vomiting.

Chronic : In general, zinc is considered to be a low toxicity metal. Zinc is a very important trace element for humans and the body regulates the amount of zinc stored by decreasing absorption and increasing excretion when intake is increased. Industrial experience has not identified any significant chronic effects from zinc sulfate to date. Zinc sulfate is not listed as a carcinogen by the Occupational Safety and Health Administration (OSHA), the National Toxicology Program (NTP), the International Agency for Research on Cancer (IARC), the American Conference of Governmental Industrial Hygienists (ACGIH) or the European Union (EU).

## SECTION 12. ECOLOGICAL INFORMATION

This product has high water solubility and its zinc and manganese contents are directly bioavailable. The zinc in particular may be toxic to aquatic organisms, especially fish, with water hardness, pH and dissolved organic carbon levels being regulating factors. In terrestrial systems, the mobility of zinc and manganese in soil and their degree of bioaccumulation in organisms is dependent on soil chemical conditions.

## SECTION 13. DISPOSAL CONSIDERATIONS

Do not wash down drain. Put uncontaminated material back into the process if at all possible. Place contaminated material in suitable, labeled containers for disposal. Dispose of waste material consistent with the requirements of waste disposal authorities.

**SECTION 14. TRANSPORT INFORMATION**

TRANSPORT CANADA CLASSIFICATION..... Not regulated
US DOT HAZARD CLASSIFICATION ..... Class 9,
Packing Group III (RQ)
(Regulated only if transported in containers containing
1,000 (RQ) or more lbs. of zinc sulfate.)
US DOT PRODUCT IDENTIFICATION NUMBER..... UN3077
MARINE POLLUTANT (U.S.)..... No
IMO CLASSIFICATION..... Not regulated

**SECTION 16. OTHER INFORMATION**

Although reasonable precautions have been taken in the preparation of the data contained herein, it is offered solely for your information, consideration and investigation. JSRUL. extends no warranty and assumes no responsibility for the accuracy of the content and expressly disclaims all liability for reliance thereon. This material safety data sheet provides guidelines for the safe handling and processing of this product; it does not and cannot advise on all possible situations. Therefore, your specific use of this product should be evaluated to determine if additional precautions are required. Individuals exposed to this product should read and understand this information and be provided pertinent training prior to working with this product.