MATERIAL SAFETY DATA SHEET (MSDS)
FERROUS SULFATE MONOHYDRATE

SECTION 1 - Chemical Product and Company Identification

Material Name: Ferrous Sulphate Monohydrate
Supplier: NUMINOR CHEMICAL INDUSTRIES LTD.
Address: P. O. BOX 92, MAALOT 24952, ISRAEL.
Tel: + 972-4-9978220
Fax: + 972-4-9976062
E-Mail: zinc@numinor.com
Web Site: www.numinor.com
Emergency Response Number: +972 50 577-1762 Mr. Oded Valfer

SECTION 2 - Hazards Identification

WARNING!
Harmful if swallowed or inhaled. Causes irritation to skin, eyes and respiratory tract. Affects the liver.

Potential Health Effects
Eye Contact: Causes irritation, redness, and pain.
Skin Contact: Causes irritation to skin. Symptoms include redness, itching, and pain.
Ingestion: Low toxicity in small quantities but larger dosages may cause nausea, vomiting, diarrhea, and black stool. Pink urine discoloration is a strong indicator of iron poisoning. Liver damage, coma, and death from iron poisoning has been recorded. Smaller doses are much more toxic to children.
Inhalation: Causes irritation to the respiratory tract. Symptoms may include coughing, shortness of breath.
Chronic Exposure: Severe or chronic ferrous sulfate poisonings may damage blood vessels. Large chronic doses cause rickets in infants. Chronic exposure may cause liver effects. Prolonged exposure of the eyes may cause discoloration.

R-Phrases:
R22- Harmful if Swallowed
R36/37/38- Irritating to eyes, respiratory system and skin.

SECTION 3 - Composition, Information on Ingredients

Chemical Name: Ferrous Sulfate Monohydrate
Formula: FeSO₄ · H₂O
Synonyms: Ferrous Sulphate, Iron Sulphate
CAS No.: 17375-41-6
% (by weight): app. 90-100%
SECTION 4 – First Aid Measures

First aid
- **Skin contact:** Rinse immediately with plenty of soap and water. Remove contaminated clothing and seek medical attention if irritation develops.
- **Inhalation:** Remove victim from exposure to fresh air. If feeling unwell, immediately seek medical attention.
- **Eye contact:** Rinse immediately with clean water for at least 15 minutes occasionally lifting the upper and lower eyelids. Seek medical attention.
- **Ingestion:** If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Protection of rescue personnel: Avoid all unnecessary exposure. Use appropriate protection. (see Section 9).

SECTION 5 – Firefighting Measures

**General Information:** As in any fire, wear a self-contained breathing apparatus in pressure-demand, and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Substance is noncombustible. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion.

**Extinguishing Media:** Use protective clothing and breathing equipment appropriate for the surrounding fire. Use any means suitable for extinguishing surrounding fire.

**Autoignition Temperature:** Not applicable.
**Flash Point:** Not applicable.
**Explosion Limits, lower:** Not available.
**Explosion Limits, upper:** Not available.

SECTION 6 – Accidental Release Measures

**Personal precautions:** Wear suitable gloves and eye/face protection as indicated in Section 8. Avoid dust creation.

**Environmental precautions:** Do not let product enter drains, sewage system, ground water.

**Methods for cleaning up:** Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation. Place under an inert atmosphere.
SECTION 7 – Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Do not ingest or inhale. Handle under an inert atmosphere. Store protected from air.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area. Do not use this product if coated with brownish-yellow basic ferric sulfate. Isolate from incompatible substances.

SECTION 8 – Exposure Controls and Personal Protection

- Respiratory protection: A respiratory protection program that meets European Standard EN 149 must be followed whenever workplace conditions warrant a respirator’s use. Follow the respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.
- Hand protection: Appropriate gloves to prevent skin exposure.
- Skin protection: Appropriate work clothes to prevent skin exposure.
- Eye protection: Chemical goggles or safety glasses.

SECTION 9 – Physical and Chemical Properties

Physical State: Solid Powder
Melting Point: 57°C (135°F) Loses water
Boiling Point: > 300°C (> 572°F) Decomposes.
Density: app. 1.5 g/cm³
Solubility in water: 48.6 g/100 g water @ 50°C
Appearance & Odour: Slight grey to off-white powder or granular

SECTION 10 – Stability and Reactivity

Chemical Stability: Stable under ordinary conditions of use and storage. Loses water in dry air and oxidizes upon exposure to moisture, forming a brown coating of extremely corrosive basic ferric sulfate.

Conditions to Avoid: Moisture.
Incompatibilities with Other Materials: Alkalis, soluble carbonates, and oxidizing materials. Reacts in moist air to form ferric sulfate.
Hazardous Decomposition Products: Burning may produce sulfur oxides.
Hazardous Polymerization: Has not been reported
SECTION 11 – Toxicological Information

LD50/LC50: No information available.
Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Neurotoxicity: No information available.
Mutagenicity: No information available.
Other Studies: No information available.

SECTION 12 – Ecological Information

This product is highly water soluble and is directly acidic which can result in toxic impacts. As well, in aquatic and terrestrial environments, its ferrous iron content will oxidize, consuming oxygen and the resultant hydrolysis reactions will generate additional acidity. These will also produce ferric hydroxide precipitates that can detrimentally affect aquatic organisms.

SECTION 13 – Disposal Considerations

Disposal: Comply with local regulations for disposal.
Waste of residues: This material and its container must be disposed of as hazardous waste. Because of possible pollution, remove as industrial waste or hazardous waste. Avoid release to the environment. Refer to special instructions/safety data sheets.
Contaminated packaging: Keep waste packaging separate.

SECTION 14 – Transport Information

Hazard Labels:

UN - No: UN 3077
ADR/IMO-IMDG: 9
Shipping Name: Environmentally Hazardous Substance, Solid, n.o.s.-Ferrous Sulphate
Packaging Group: III
SECTION 15 – Regulatory Information

Symbol:

- Xn Harmful
- N
- N Dangerous for the Environment

Risk phrases:
R22- Harmful if Swallowed
R36/37/38- Irritating to eyes, respiratory system and skin.

Safety phrases:
S: 2-22-26-39-46-60-61 Keep out of the reach of children. Do not breathe dust. Wash contaminated eyes with plenty of water and seek for doctors advice. Wear protective goggles and face protection. In case of ingestion seek for doctors advice immediately - show packaging or label. This material and its container must be disposed of as hazardous waste. Avoid release to the environment. Refer to special instructions / Material Safety data sheets.

SECTION 16 – Additional Information

Date of Issue: February 2010
Last update: February 2010
MSDS prepared by: AVK

Disclaimer: As the conditions or methods of use are beyond our control, we do not assume any responsibility and expressly disclaim any liability for any use of the material. Information contained herein is believed to be true and accurate but all statements or suggestions are made without any warranty, express or implied, regarding accuracy of the information, the hazards connected with the use of the material or the results to be obtained from the use thereof.