

Ferrous Sulphate

Material Safety Data Sheet

(This document conforms to ISO 11014-1)

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Supplier / Manufacturer:



Kimleigh Chemicals SA (Pty) Ltd
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Potchefstroom, North West Province, 2531, South Africa.
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Web: www.kimleigh.com Email: sales@kimleigh.co.za

Chemical Name:

Ferrous Sulphate Monohydrate.

Synonyms:

Iron (II) Sulphate Monohydrate.

Product ranges:

Animade and Fertion.

Chemical Family:

Transition metal sulphates.

Material Uses:

Animal feeds, fertilizers, wood preservative, cement, water and sewage treatment, catalyst and food additive.

2. COMPOSITION / INFORMATION ON INGREDIENTS

Substance Name:

Ferrous Sulphate Monohydrate.

Assay % by Weight:

90 % minimum.

Appearance:

Grey to off-white crystals.

Molecular Formula:

$\text{FeSO}_4 \cdot \text{H}_2\text{O}$

Molar Mass:

169.92 g/mol

CAS Number:

17375-41-6

EC Number:

231-753-5

3. HAZARD IDENTIFICATION

Physical State and Appearance:

Grey to off-white crystals.

Emergency Overview:

This substance is not classified as dangerous according to European Union Legislation. The product should be handled with care usual when dealing with chemicals.

GHS Classification:

H302: Harmful if swallowed.
H319: Causes serious eye irritation.
H335: May cause respiratory irritation.
H315: Causes skin irritation.

Pictogram:



Signal word:

Warning

Warning

Routes of Entry:	Eye Contact. Inhalation. Ingestion. Absorbed through skin.
Potential Health Effects:	<p><i>Eyes</i> May cause eye irritation and local inflammation. Possible corneal burn symptoms include stinging, tearing and redness.</p> <p><i>Skin</i> May cause skin irritation. Symptoms include redness, itching and pain.</p> <p><i>Inhalation</i> May cause respiratory tract irritation. Other symptoms can include irritation of nasal passages, sore throat, shortness of breath and coughing.</p> <p><i>Ingestion</i> May cause irritation and/or a burning sensation in the mouth, pharynx, oesophagus and gastrointestinal tract. Symptoms may include abdominal pain, nausea, vomiting, diarrhoea 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.</p>
Potential Chronic Health Effects:	<p><u>CARCINOGENIC EFFECTS:</u> No component of this product presented at levels greater than or equal to 0.1 % is identified as probable, possible or confirmed human carcinogen by IARC.</p> <p><u>MUTAGENIC EFFECTS:</u> Not suspected.</p> <p><u>TERATOGENIC EFFECTS:</u> Not suspected.</p> <p>Severe or chronic ferrous sulphate 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.</p>

4. FIRST AID MEASURES

General Advice:	Consult a physician. Show this material safety data sheet to the doctor in attendance.
Eye Contact:	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Remove contact lenses if present and easy to do so. Continue rinsing. Get medical attention immediately.
Skin Contact:	In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash off with soap and plenty of water. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention if irritation persists.
Inhalation:	If inhaled, move person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Rinse mouth with water. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

5. FIRE-FIGHTING MEASURES

Flammability of Product: Not combustible.

Auto-ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Toxic sulphur and Iron oxides.

Fire Hazards in Presence of Various Substances: When heated to decomposition it emits toxic fumes of sulfur oxides (SO_x) and iron oxides.

Explosion Hazards in Presence of Various Substances: Risks of explosion of the product in presence of static discharge: No.
Risks of explosion of the product in presence of mechanical impact: No.

Fire Fighting Media and Instructions: Small fire: Use dry chemicals, CO₂, alcohol-resistant foam or water spray.
Large fire: Water spray or fog, alcohol-resistant foam.

Protective Clothing (Fire): Wear NIOSH approved self-contained breathing apparatus or equivalent and full protective gear.

Special Remarks on Fire Hazards: Prevent fire-fighting water from entering surface water or groundwater.

Special Remarks on Explosion Hazards: This material in sufficient quantity and reduced particle size is capable of creating a dust explosion.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Use personal protective equipment. Avoid substance contact and inhalation. Ensure adequate ventilation.

Environmental Protection Measures: Do not allow to enter sewerage system.

Small Spill: Use appropriate tools and personal protective equipment. Pick up spillage. Dispose of in a waste disposal container. Do not allow to enter sewerage system.

Large Spill: Use appropriate tools and personal protective equipment. Contain material. Take up spillage limiting generation of dust. Dispose of in a waste disposal container. Do not allow to enter sewerage system.

7. HANDLING AND STORAGE

Handling:

Handle with care in accordance with good industrial hygiene and safety practices. Minimise dust generation. Avoid inhalation of dust. Avoid contact with eyes and skin and any form of ingestion. Wear suitable protective clothing such as overalls, boots, rubber gloves, goggles, nose and mouth protection and wash contaminated clothing daily. Wash thoroughly with soap and water after use or accidental skin contact. Do not eat, drink or smoke during use. Avoid contamination of food, foodstuffs, eating utensils and drinking water. Do not discharge product or residues into rivers, dams and canals.

Storage:

Store in a cool, dry and well ventilated place away from food, foodstuffs, combustible materials and incompatible substances. Store under lock and key and keep out of reach of children, uninformed persons and animals. Access to water and eye wash facility should be available. Do not use this product if coated with brownish-yellow basic ferric sulphate.

8. EXPOSURE CONTROL / PERSONAL PROTECTION

Engineering controls:

Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:

Protective clothing should be selected specifically for the working place, depending on concentration and quantity of the substance handled.

Eyes Safety glasses with side shields / face shield.

Body Body-covering clothing / full suit.

Respiratory Dust respirator. Be sure to use a MSHA/NIOSH approved respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.

Hands Gloves.

Feet Boots.

Hygiene Measures:

Handle in accordance with good industrial hygiene and safety practices. Remove and wash contaminated clothing. Wash hands after use and before eating or smoking. Wash promptly if skin becomes contaminated or wet.

Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State and Appearance:	Grey to off-white powder.
Odour:	Odourless.
pH (50 g/l at 25 °C):	3.0 – 5.0
Boiling Point:	> 300 °C (decomposes).
Melting Point:	Not available.
Density / Specific gravity (25 °C):	1.97 g/m ³
Thermal Decomposition:	Not available.
Bulk Density:	1,500 kg/m ³
Vapour Pressure:	Not available.
Vapour Density:	Not available.
Volatility:	Not available.
Odour Threshold:	Not available.
Evaporation Rate:	Not available.
VOC:	Not available.
Log K_{ow}	Not available.
Ionicity (in water)	Not available.
Dispersion Properties	Not available.
Solubility in water (50 °C)	48.6g / 100g water.

10. STABILITY AND REACTIVITY

Stability and Reactivity:	The product is stable under recommended conditions of storage and use. Loses water in dry air and oxidizes upon exposure to moisture, forming a brown coating of extremely corrosive basic ferric sulphate.
Conditions of Instability:	Avoid contact with moisture.
Incompatibility with Various Substances:	Alkalis, soluble carbonates and oxidizing agents. Reacts in moist air to form ferric sulphate.
Hazardous Decomposition Products:	Toxic sulphur dioxide fumes. Iron oxides.
Hazardous Polymerization:	Will not occur.

11. TOXICOLOGICAL INFORMATION

Toxicity:	LD50 Oral: 319 mg/kg [RAT]
Chronic Effects on Humans:	May be harmful if swallowed or inhaled. May cause irritation to skin, eyes and respiratory tract. Affects the liver.

CARCINOGENIC EFFECTS:

No component of this product presented at levels greater than or equal to 0.1 % is identified as probable, possible or confirmed human carcinogen by IARC.

MUTAGENIC EFFECTS:

Not suspected.

TERATOGENIC EFFECTS:

Not suspected.

Acute Effects on Humans:

May cause eye irritation. Inflammation of the eye is characterized by redness, watering and itching.

May cause skin irritation. Skin inflammation is characterized by itching, scaling, reddening or, occasionally blistering.

Inhalation may cause damage or irritation of respiratory tract. Symptoms can include irritation of nasal passages, sore throat, shortness of breath and coughing.

It may cause irritation and/or a burning sensation in the mouth, pharynx, oesophagus and gastrointestinal tract. Low toxicity in small quantities but larger dosages may cause abdominal pain, nausea, vomiting, diarrhoea and black stool. Pink urine discoloration is a strong indicator of iron poisoning.

**Synergetic Products:
(Toxicologically)**

Not available.

Irritancy:

Draize Test: Not available.

Sensitization:

Not available.

Toxicity to Reproductive System:

Not available.

12. ECOLOGICAL INFORMATION

Ecotoxicity:

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

Daphnia: Daphnia Magna (EC50): Not available.

Algae: Sc.quadricauda (IC50): Not available.

Biodegradable/OECD:

Not available.

Mobility:

Do not allow to enter water or soil.

Toxicity of the Products of Biodegradation:

Not available.

13. DISPOSAL CONSIDERATIONS

Treatment: Consultation with a permitted waste disposal site (TSD) should be accomplished. Always contact a permitted waste disposal site (TSD) to assure compliance with all current, local, national, and Governmental regulations.

14. TRANSPORT INFORMATION

Land Transport: *ADR / RID*
UN-Number: 3077 Class: 9 Packing group: III
ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID,
N.O.S. (Ferrous Sulphate Monohydrate)

Marine Transport: *IMDG*
UN-Number: 3077 Class: 9 Packing group: III
ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID,
N.O.S. (Ferrous Sulphate Monohydrate)

Air Transport: *IATA*
UN-Number: 3077 Class: 9 Packing group: III
ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID,
N.O.S. (Ferrous Sulphate Monohydrate)

15. REGULATORY INFORMATION

Republic of South Africa Regulations: National Water Act 36 of 1998.
Occupational Health and Safety Act, 1993.
Environmental Conservation Act 73 of 1989.
Hazardous Substances Act, 1973.
Provincial Ordinances and Local By-laws.

GHS Classification:

Pictograms:



Signal Word:

Warning

Warning

Hazard Statements:

H302:	Harmful if swallowed.
H319:	Causes serious eye irritation.
H335:	May cause respiratory irritation.
H315:	Causes skin irritation.
H411:	Toxic to aquatic life with long lasting effects.

Precautionary Statements:

P260:	Do not breathe dust.
P273:	Avoid release to the environment.
P305+351+388:	IF IN EYES: Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing.
P302+352:	IF ON SKIN: Wash with soap and water.

16. OTHER INFORMATION

Label Requirement: Keep away from food and foodstuffs.

Emergency Contact: KIMLEIGH CHEMICALS SA (PTY) LTD
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