

Safety Data Sheet



According to: The Regulations for Hazardous Chemical Agents, 2021 and Globally Harmonized System of Classification and Labelling of Chemicals (GHS) Rev. 9.

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Agricultural division:



SECTION 1: Identification of the substance / mixture and of the supplier

1.1 Product identifiers

Product (trade) name : Manganese Sulphate Monohydrate
Act No. 36 of 1947 Registration number : B4230 (Fertilizer) / V24103 (Feed)
Grade : Fertilizer / Feed
Product range : Fertion (Fertilizer) / Animade (Feed)
Synonyms : Manganese (II) sulphate monohydrate.

1.2 Relevant identified uses of the substance or mixture and restrictions on use

Relevant identified uses

Used as an additive in the manufacturing of animal feeds, fertilizers, pesticides and human food.

Restrictions on use

Avoid release into the environment; use personal protective equipment.

1.3 Details of the supplier of the safety data sheet

Company : Kimleigh Chemicals SA (Pty) Ltd
Address : 11 Jasper van der Westhuizen Street, Potchindustria, Potchefstroom 2531, North West province, South Africa
Telephone : +27 18 293 1028; +27 18 285 1014
WhatsApp : +27 71 426 3648
E-mail address : sheq@kimleigh.co.za

1.4 Emergency telephone number

Emergency phone number: +27 18 293 1028; +27 18 285 1014

Monday to Thursday from 7:00 a.m. to 5:00 p.m.; Friday from 7:00 a.m. to 14:00 p.m.

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Globally Harmonized System of Classification and Labelling of Chemicals (GHS) Rev.9 and Regulation (EC) No 1272/2008




GHS Hazard class	GHS Hazard category	GHS Hazard statement codes
Serious eye damage / irritation	1	H318
Specific target organ toxicity – repeated exposure	2	H373
Hazardous to the aquatic environment, long-term (Chronic)	2	H411

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2.2 Label elements

Labelling according to Globally Harmonized System of Classification and Labelling of Chemicals (GHS) Rev.9 and Regulation (EC) No 1272/2008

Pictogram(s)			
Signal word(s)	Danger		

Hazard statement(s)

- H318 : Causes serious eye damage.
H373 : May cause damage to organs (not specified) through prolonged or repeated exposure.
H411 : Toxic to aquatic life with long lasting effects.

Precautionary statement(s)

- P260 : Do not breathe dust / fume / gas / mist / vapours / spray.
P264 + P265 : Wash hands thoroughly after handling. Do not touch eyes.
P273 : Avoid release to the environment.
P280 : Wear protective gloves / protective clothing / eye protection / face protection / hearing protection.
P305 + P317 + P338 + P354 : IF IN EYES: immediately rinse with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical help.
P319 : Get medical help if you feel unwell.
P391 : Collect spillage.
P501 : Dispose of contents/container in accordance with national regulations.

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

SECTION 3: Composition / Information on ingredients

3.1 Substances

- Chemical identity : Manganese sulphate monohydrate
(IUPAC / CAS name)
Common name : Manganese sulphate monohydrate
Synonyms : Manganese (II) sulphate monohydrate.

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Formula : $\text{MnSO}_4 \cdot \text{H}_2\text{O}$
Molecular weight : 169.02 g/mol
Appearance : White / slightly pink powder, odourless
Purity : $\geq 98\%$ w/w; Manganese (Mn) as 31.8 % min.

Compound	CAS No.	EC No.	Index No.
Manganese sulphate monohydrate	10034-96-5	232-089-9	025-003-00-4

SECTION 4: First-aid measures

4.1 Description of first-aid measures

General advice

Consult a physician in case of emergency. Show this safety data sheet to the doctor in attendance.

If inhaled

Following inhalation, move the affected person to fresh air. If not breathing, give artificial respiration. If difficulty breathing, give oxygen. Seek medical attention.

In case of skin contact

In case of contact, immediately rinse skin with copious amounts of cold water, while removing contaminated clothes and shoes. Cover the irritated skin with an emollient. Wash exposed clothing and shoes before reuse. Seek medical attention if irritation persists.

In case of eye contact

In case of contact, remove any contact lenses and rinse eyes with copious amounts of water for at least 15 minutes. Cold water may be used. Seek immediate medical attention.

If swallowed

Following ingestion, rinse mouth with copious amounts of water. Seek immediate medical attention. Do not induce vomiting unless directed otherwise by a medical practitioner. Never administer anything by mouth to an unconscious person.

4.2 Most important symptoms and effects, both acute and delayed

If inhaled

Coughing; dry throat; irritation of nasal and respiratory passages; shortness of breath.

In case of skin contact

Not a skin irritant.

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In case of eye contact

Causes serious eye damage; redness; pain; watering; itching and visual disturbances such as blurred vision.

If swallowed

Possible nausea; vomiting; diarrhoea and shock.

4.3 Indication of any immediate medical attention and special treatment needed

Physician should treat symptomatically.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

Use dry chemicals, carbon dioxide (CO₂), alcohol-resistant foam, water spray or fog. The product is non-combustible / non-flammable.

Unsuitable extinguishing media

No limitations on extinguishing agents are available.

5.2 Special hazards arising from the substance or mixture

Produces oxides of sulphur and manganese on combustion or thermal decomposition.

5.3 Special PPE and precautions for firefighters

In the event of fire, wear positive-pressure self-contained breathing apparatus and appropriate protective clothing. Prevent fire extinguishing water from contaminating surface and ground water reservoirs by containing and keeping the run-off water separate.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Wear respiratory protection. Avoid dust formation. Avoid inhalation of dust, vapours, mist or gas. Ensure adequate ventilation. Avoid contact with skin and eyes. Evacuate personnel to safe areas.

For personal protection, please see section 8.

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6.2 Environmental precautions

Avoid release into the environment. Do not discharge into drains, sewage systems or onto the ground. Avoid spillage or run-off entering drains, sewage systems or watercourses. Immediately report uncontrolled spillage or discharges to an appropriate regulatory body.

6.3 Methods and materials for containment and cleaning up

Cover drains. Do not touch spilled material. Collect dry powder using a special dust vacuum cleaner or carefully sweep into suitable waste container for disposal according to national regulations and seal securely. Avoid generating dust. Label the container appropriately and remove from the area as soon as possible.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Handle with care in accordance with good industrial hygiene and safety practices. Do not swallow or inhale dust, spray, mist or vapours. Avoid contact with eyes, skin and any form of ingestion. Avoid the formation of dust and aerosols. Wear suitable protective clothing such as overalls, boots, rubber gloves, safety goggles, nose and mouth protection. Wash contaminated clothing daily. Provide appropriate ventilation where dust formation might occur. If skin or eye contact occurs, wash thoroughly with water.

Do not eat, drink or smoke when using this substance. Avoid contamination of food, foodstuffs, eating utensils and drinking water by washing-up before entering eating areas. Do not discharge product residues into the environment.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions

Store in an airtight container in a cool, dry and well-ventilated place. Keep away from food, foodstuffs, incompatible substances, steel structures or steel components. Close container tightly after opening.

Minimize dust generation and accumulation. Store away from direct sunlight, moisture, heat and oxidisers.

Moisture sensitive; hygroscopic; handle and store under inert gas, if possible.

Store under lock and key, and keep out of reach of children, uninformed persons and livestock.

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SECTION 8: Exposure controls / Personal protection

8.1 Control parameters

Occupational exposure limits (OEL)

GN 280 of 29 March 2021; Regulations for Hazardous Chemical Agents, Government Gazette, RSA. : The OEL eight-hour TWA is 0.2 mg/m³.

8.2 Appropriate engineering controls

Provide adequate general and local exhaust ventilation to ensure that the airborne levels remain below the recommended exposure limits. Mechanical ventilation should be used if dust formation occurs. Avoid contact with eyes, skin and clothing. Wash hands immediately after handling the product. Comply with good industrial hygiene practices. Provide an eyewash station and a safety shower in case of emergency.

8.3 Personal protective equipment

- Eye/Face protection : Use safety goggles that are compliant with the EN 166 standard as a minimum.
- Skin protection : Nitrile or neoprene gloves that are compliant with the EN 374 standard as a minimum.
- Body protection : Wear protective clothing that are compliant with the EN 368 standard as a minimum.
- Respiratory protection : Wear approved respiratory protection that are compliant with the EN 140 standard as a minimum.
- Control of environmental exposure : Do not let the substance enter drains or sewage systems and prevent leakages or spillage or any form of discharge into the environment. Do not allow the substance to contaminate ground water systems.

SECTION 9: Physical and chemical properties

- Physical state : Powder
- Colour : White / slightly pink
- Odour : Odourless
- pH (50 g/L at 20 °C) : 3.0 – 5.0
- Melting point/freezing point : > 450 °C
- Initial boiling point and boiling range : No data available

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Flammability	: Not flammable
Lower and upper explosion limit / flammability limit	: No data available
Flash point	: Not applicable. The substance is an inorganic solid.
Auto-ignition temperature	: No data available.
Decomposition temperature	: No data available.
Kinematic viscosity	: No data available.
Solubility	: Soluble in water at 450 g/L at 20 °C.
Partition coefficient (n-octanol/water)	: Not applicable. The substance is an inorganic solid.
Vapour pressure	: Not applicable. Substance is a solid.
Density (relative)	: 2.93 kg/m ³ at 22 °C
Relative vapour density	: Not applicable. Substance is a solid.
Particle characteristics	: < 500 µm.

SECTION 10: Stability and reactivity

10.1 Reactivity

The substance is hygroscopic.

10.2 Chemical stability

The substance is chemically stable under standard ambient conditions (room temperature). No decomposition will occur if the substance is used and stored according to specifications.

10.3 Possibility of hazardous reactions

Violent reactions may occur with acids.

10.4 Conditions to avoid

Exposure to moisture and heat. Avoid dust formation.

10.5 Incompatible materials

Avoid contact with strong oxidizing agents, alkali metals, alkaline earth metals, lead, calcium, strontium salts and borax.

10.6 Hazardous decomposition products

Manganese and sulphur oxides.

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SECTION 11: Toxicological information

11.1 Information on toxicological effects

Classification according to Globally Harmonized System of Classification and Labelling of Chemicals (GHS) Rev.9, The National Institute for Occupational Safety and Health (NIOSH) and Regulation (EC) No 1272/2008

Acute toxicity:

Route of exposure	Dose / concentration; test subject	Numerical measures	ATE Actual / Converted
Ingestion (oral)	LD ₅₀ ; rats	2150 mg/kg bw	2150 mg/kg bw
Inhalation	LD ₅₀ ; rats	> 4.98 mg/L	No deaths reported at this mean achieved atmosphere concentration; therefore, no true LD ₅₀ .
Dermal	No data available	No data available	No data available

Skin corrosion / irritation:

Rabbit skin clipped sites (5 cm²) – semi-occlusive dressing with 0.5 g moistened product (72-h exposure)

Result – No skin irritation; therefore, not a skin irritant.

OECD Test Guideline 404

Serious eye damage / eye irritation:

White rabbit eyes – 80 mg into conjunctival sac (rabbit humanely euthanized after 7-day exposure)

Result – Corneal opacity or epithelial damage observed, conjunctival redness, chemosis and discharge observed in all the test animals; therefore, a serious eye irritant.

OECD Test Guideline 405

Respiratory or skin sensitization:

No data available for respiratory sensitization.

For skin sensitization:

Human test subjects; 0.3 and 0.5 M; 75-80 % w/v solution (48 h exposure).

Result – Negative; therefore, not sensitizing.

No Test Guideline available

Germ cell mutagenicity:

No classification necessary, based on the negative *in vitro* results obtained for the read-across substance MnCl₂.

Carcinogenicity:

No classification necessary, based on the fact that results obtained for the read-across substance MnCl₂ shows no carcinogenic nature.

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Reproductive toxicity:

No classification necessary, based on the fact that results obtained for the read-across substance $Mn(NO_3)_2$ shows no reproductive or developmental toxicity.

Specific target organ toxicity (STOT) - single exposure:

No data is available for Manganese sulphate monohydrate in this regard.

Specific target organ toxicity (STOT) - repeated exposure:

Manganese sulphate monohydrate shows inhalation toxicity after repeated exposures.

Aspiration hazard:

No data is available for Manganese sulphate monohydrate.

11.2 Additional Information

It was found that industry workers with liver dysfunction, may be more susceptible to the toxic effects of this metal (ECHA, 2023).

SECTION 12: Ecological information

12.1 Toxicity

Classification according to Globally Harmonized System of Classification and Labelling of Chemicals (GHS) Rev.9, The National Institute for Occupational Safety and Health (NIOSH) and Regulation (EC) No 1272/2008

Type of toxicity	Dose / concentration administered	Numerical measures	References
Short-term (acute) aquatic hazard	LC ₅₀ in Fish EC ₅₀ in Crustacea	3.8 mg Mn/L/96h (= 11.7 mg MnSO ₄ •H ₂ O) 9.8 mg Mn/L/48h (= 30.2 mg MnSO ₄ •H ₂ O)	ECHA, 2023
Long-term (chronic) aquatic hazard	NOEC in Fish NOEC in Crustacea NOEC in Algae	4.5 mg Mn/L (= 13.9 mg MnSO ₄ •H ₂ O) 0.01 – 0.02 mg Mn/L (= 0.03-0.06 mg MnSO ₄ •H ₂ O) 1.0 mg MnSO ₄ •H ₂ O/L	ECHA, 2023

12.2 Persistence and degradability

Biodegradation tests are not applicable to inorganic substances like Manganese. As an alternative, the concept of "removal from the water column" was developed. Rapid removal (defined as > 70% removal within 28 days) is considered equivalent to rapid degradability. Manganese is rapidly removed from the water column; therefore,

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Manganese is considered as equivalent to being rapidly degradable for the purpose of chronic aquatic classification (ECHA, 2023).

12.3 Bioaccumulative potential

Manganese sulphate monohydrate is unlikely to bioaccumulate in any organism, due to an organism's ability to regulate its intake and loss from natural sources seeing as it is an essential trace nutrient in animals and is required for the photosynthetic process in plants.

12.4 Mobility in soil

Seeing as this substance is rapidly removed from the water column, it spreads easily throughout the environment via water systems.

12.5 Other adverse effects

Care should be taken to minimize the amount of Manganese sulphate monohydrate released into the environment. Even though Manganese is an essential micronutrient for healthy plant growth, it can be harmful to Manganese-sensitive plants in higher quantities.

This substance does not contribute to ozone depletion, ozone formation, global warming or acidification.

SECTION 13: Disposal considerations

The generation of waste should be restricted or minimized wherever possible. Any form of discharge or leakage into the environment, should be avoided. Do not dispose of this substance in the drain. Dispose of this substance in accordance with the regulations stipulated in the National Environmental Management Waste Act 2008 of South Africa.

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SECTION 14: Transport information

	Land transport (UN TDG/ADR)	Sea transport (IMDG)	Air transport (IATA-DGR)
14.1 UN Number	3077	3077	3077
14.2 UN Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (includes Manganese sulphate monohydrate)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (includes Manganese sulphate monohydrate)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (includes Manganese sulphate monohydrate)
14.3 Transport hazard class(es)	9	9	9
14.4 Packing group	III	III	III
14.5 Environmental hazards	Yes	Marine pollutant: yes	Yes

14.6 Transport in bulk according to IMO instruments

Maritime transport in bulk is not intended.

14.7 Special precautions for user

Ensure that packaging remains intact. Dust formation should be restricted wherever possible.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations specific for the substance or mixture

This material safety data sheet complies with the requirements stipulated in The Globally Harmonized System of Classification and Labelling of Chemicals (GHS), 9th revised edition, United Nations: New York and Geneva, 2021.

National legislation

Occupational Health and Safety Act, 1993 - Hazardous Chemical Agent Regulations 2021.

Other regulations

European Agency for Safety and Health at Work (OSHA) guidelines.

The National Institute for Occupational Safety and Health (NIOSH) guidelines.

15.2 Chemical Safety Assessment

No chemical safety assessment was carried out for this substance.

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SECTION 16: Other information

List of abbreviations

ADR	: European Agreement concerning the International Carriage of Dangerous Goods by Road
ATE	: Acute toxicity estimate
bw	: Body weight
CAS	: Chemical Abstracts Service
DGR	: Dangerous Goods Regulations
EC	: European Community
EC ₅₀	: Half maximal effective concentration
ECHA	: European Chemicals Agency
EN	: European Nations
EU	: European Union
GHS	: Globally Harmonised System of Classification and Labelling of Chemicals
GN	: Government Notice
IATA	: International Air Transport Association
IMDG	: International Maritime Dangerous Goods
IMO	: International Maritime Organization
IUPAC	: International Union of Pure and Applied Chemistry
LC ₅₀	: Lethal Concentration to 50% of a test population
LD ₅₀	: Lethal Dose to 50% of a test population (Median Lethal Dose)
NIOSH	: The National Institute for Occupational Safety and Health
No.	: Number
NOEC	: No observed effect concentration
N.O.S.	: Not otherwise specified
OECD	: Organisation for Economic Co-operation and Development
OEL	: Occupational exposure limit
OSHA	: The Occupational Safety and Health Administration
PBT	: Persistent, bioaccumulative and toxic
PPE	: Personal protective equipment
RSA	: Republic of South Africa
STOT	: Specific target organ toxicity
TDG	: Transport of Dangerous Goods
TWA	: Threshold weighted average
UN	: United Nations
vPvB	: Very persistent and very bioaccumulative

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References:

ECHA. 2023. Manganese sulphate. Available at: <https://echa.europa.eu/registration-dossier/-/registered-dossier/15179> (Accessed: 13.02.2023).

GHS. 2021. The Globally Harmonized System of Classification and Labelling of Chemicals (GHS), 9th revised edition, United Nations: New York and Geneva. p. 550.

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