

SECTION 1: Product and Company Identification

1.1. Product identifier

Trade name : VERDUR Mn
Chemical name : Manganese Sulfate Monohydrate
CAS No : 10034-96-5

1.2. Relevant identified uses of the substance or mixture and uses advised against

1.2.1. Relevant identified uses

Use of the substance/preparation : Micronutrient fertilizer

1.2.2. Uses advised against

No data available

1.3. Details of the supplier of the safety data sheet

Rainbow Treecare Scientific Advancements
11571 K-Tel Drive
Minnetonka, MN 55343
Phone: 1-(877) 272-6747 (toll free)
www.treecarescience.com

1.4. Emergency telephone number

Emergency number : (800)-424-9300 (CHEMTREC)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification

Hazard Class	Category	Hazard Statement
STOT RE	2	H373
Aquatic Chronic	2	H411

Full text of H-phrases: see section 16

2.2. Label elements

GHS Labeling Elements

Hazard pictograms (GHS-US) :



GHS08

GHS09

Signal word (GHS-US) : WARNING

Hazard statements (GHS-US) : H373 – May cause damage to organs through prolonged or repeated exposure
H411 – Toxic to aquatic life with long lasting effects

Precautionary statements (GHS-US) : P260 – Do not breathe dust



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GHS Labeling Elements

P273 – Avoid release to the environment
P280 – Wear protective gloves/protective clothing/eye protection/face protection
P314 – Get medical attention/advice if you feel unwell
P391 – Collect spillage

2.3. Other hazards

Other hazards not contributing to the classification : None under normal conditions

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/information on ingredients

3.1. Substance

Substance type : Mono-constituent

Name	Product identifier	%/wt.
Manganese Sulfate Monohydrate	(CAS No.) 10034-96-5	100

3.2. Mixture

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

- First-aid measures general** : Consult a physician. Seek medical attention if you feel unwell. Show this Safety Data Sheet to the doctor in attendance.
- First-aid measures after inhalation** : Remove person to fresh air and keep comfortable for breathing. If not breathing, give artificial respiration. Consult a physician/poison control center.
- First-aid measures after skin contact** : Rinse with water. Soap may be used. Wash skin with plenty of water. See a doctor if irritation persists.
- First-aid measures after eye contact** : Flush eyes with water. Do not apply neutralizing agents. Remove contact lenses, if present and easy to do. Rinse cautiously with water for several minutes. See an ophthalmologist if irritation develops or persists.
- First-aid measures after ingestion** : Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician. Ingestion of large quantities: seek emergency medical treatment.

4.2. Most important symptoms and effects, both acute and delayed

- Symptoms/injuries after inhalation : Dust inhalation: Coughing. Heated fumes: Metal fume fever.
- Symptoms/injuries after skin contact : May cause irritation. Slight irritation. Red skin.
- Symptoms/injuries after eye contact : May cause irritation. Redness of the eye tissue. Possible damage to eyes.
- Symptoms/injuries after ingestion : Ingestion of high quantities: Irritation of the gastric/intestinal mucosa.



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Chronic symptoms : Continuous, prolonged, or repeated exposure: Coughing. Respiratory difficulties. Impairment of the nervous system. Feeling of weakness. Loss of appetite. Behavioral disturbances. Slurred speech. Movement disturbances. Myasthenia. Tremor. Impaired concentration. Emotional instability.

4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2. Special hazards arising from the substance or mixture

Special hazard : Non-Combustible. Exposure to heat/flame: release of toxic and corrosive gases/vapors (sulfur oxides) and formation of metallic fumes possible.

Explosion hazard : No data available.

5.3. Advice for firefighters

Precautionary measures fire : Keep upwind. For large quantities: Consider evacuation. Have neighborhood close doors and windows.

Firefighting instructions : Dilute toxic gases with water spray. Take account of environmentally hazardous firefighting water. Use water moderately and if possible collect or contain it.

Protection during firefighting : Self-contained breathing apparatus. Complete protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Protective equipment : Gloves. Protective clothing. Dust production: respirator. See Section 8 "Exposure controls/personal protection."

Emergency procedures : Ventilate spillage area. Mark the danger area. Prevent dust cloud formation, e.g. by wetting. No naked flames. Wash contaminated clothes. Avoid breathing dust/mist/vapors. Avoid contact with skin and eyes.

6.1.2. For emergency responders

Protective equipment : Refer to Section 8 "Exposure controls/personal protection."

Emergency procedures : Avoid contact with skin and eyes.

6.2. Environmental precautions

Avoid release to the environment. Prevent soil and water pollution. Prevent spreading in sewers.

6.3. Methods and material for containment and cleaning up

For containment : Contain released substance, pump into suitable containers (see Section 7). Knock down/dilute dust cloud with water spray. Collect spillage.

Methods for cleaning up : Recover the product mechanically. Stop dust cloud by covering with sand/earth. Scoop solid spill into containers (see Section 7). Clean contaminated surfaces with water. Collect wash waters. Wash clothing and equipment after handling.

6.4. Reference to other sections

For further information refer to Section 8 "Exposure controls/personal protection"

SECTION 7: Handling and storage

7.1. Precautions for safe handling

- Precautions for safe handling : Ensure good work station ventilation where dust is formed. Avoid raising dust. Avoid breathing dust. Wear personal protective equipment. Clean contaminated clothing. Do not discharge wastes into drains, sewers, or waterways. Keep away from naked flames/heat. Keep container tightly closed. Observe strict hygiene. Avoid contact with skin and eyes.
- Hygiene measures : Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

7.2. Conditions for safe storage, including any incompatibilities

- Technical measures : Take all necessary measures to avoid accidental discharge of products into drains and waterways due to the rupture of containers or transfer systems.
- Storage conditions : Keep container tightly closed. Store in a cool, dry place. Protect from sunlight.
- Incompatible materials : Strong oxidizers. Metals. Reactive metals (Al, K, Zn...)
- Conditions to avoid : Heat sources, oxidizing agents, water/moisture.
- Storage area : Store in a dry, well-ventilated area.
- Special rules on packaging : Use closing, watertight, dry, opaque, correctly labeled packaging. Secure fragile packagings in solid containers.
- Packaging materials : Cardboard, plastics, glass.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Manganese Sulfate Monohydrate (10034-96-5)		
ACGIH	ACGIH TWA (mg/m ³)	0.1 mg/m ³
OSHA	OSHA PEL (TWA) (mg/m ³)	15 mg/m ³ Total Dust 5 mg/m ³ Respirable Dust
DNEL	DNEL	0.2 mg/m ³ (Long-term – systemic effects, inhalation, workers)
PNEC	PNEC	0.0128 mg/l (aqua, freshwater)

8.2. Exposure controls

- Appropriate engineering controls : Ensure good ventilation of the work station. Extraction to remove dust at its source. Eye fountain.
- Personal protective equipment : Gloves, safety glasses, long sleeve shirt, shoes with socks. In case of dust production: dust mask with filter type P1 and goggles.
- Materials for protective clothing : Good Resistance: Nitrile rubber, butyl rubber, PVC
- Hand protection : Gloves.
- Eye protection : Safety glasses. In case of dust production: protective goggles.
- Skin and body protection : Protective clothing with long sleeves and pants, socks with shoes.
- Respiratory protection : Significant dust production: dust mask with filter type P2 for higher level protection.

Environmental exposure controls : Avoid release to the environment.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Solid
Appearance	: Powder
Color	: Light red
Odor	: Odorless
Odor threshold	: No data available
pH	: 3.0 – 3.5 (5%, 20°C)
Melting/freezing point	: 700°C (1,292°F)
Boiling point	: Not applicable
Flash point	: Not applicable
Relative evaporation rate (butyl acetate=1)	: No data available
Flammability (solid, gas)	: No data available
Explosion limits	: Not applicable
Explosive properties	: No data available
Oxidizing properties	: No data available
Vapor pressure	: No data available
Relative density	: Not applicable
Relative vapor density at 20°C	: No data available
Specific gravity / density	: 2950 kg/m ³
Molecular mass	: 160.02 g/mol
Solubility	: Soluble in water. Water: 100 g/100ml
Auto-ignition temperature	: Not applicable
Decomposition temperature	: >117°C
Viscosity	: No data available
Viscosity, kinematic	: Not applicable
Viscosity, dynamic	: No data available

9.2. Other information

VOC content	: Not applicable
Other properties	: Hygroscopic. Substance has acid reaction.

SECTION 10: Stability and reactivity

10.1. Reactivity

On exposure to heat: release of toxic and corrosive gases/vapors (sulfur oxides) and formation of metallic fumes.

10.2. Chemical stability

Hygroscopic.

10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

10.4. Conditions to avoid

None under recommended storage and handling conditions (see Section 7).

10.5. Incompatible materials

Strong oxidizing agents.

10.6. Hazardous decomposition products

Sulfur oxides. Metallic oxides.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Likely routes of exposure : Skin and eye contact. Inhalation.

Acute toxicity : Not classified based on available data.

Manganese Sulfate Monohydrate (10034-96-5)	
LD50 oral rat	2150 mg/kg (Published data)
LC50 inhalation rat	>4.45 mg/l/4 hr
ATE US (oral)	2150.000 mg/kg body weight

Skin corrosion/irritation : No available data.

Serious eye damage/irritation : No available data.

Respiratory or skin sensitization : Not classified based on available data.

Germ cell mutagenicity : Not classified based on available data.

Carcinogenicity : Not classified based on available data.

Reproductive toxicity : Not classified based on available data.

Specific target organ toxicity (single exposure) : May cause damage to organs (central nervous system) through prolonged or repeated exposure (inhalation).

Specific target organ toxicity (repeated exposure) : Not classified (lack of data)

Aspiration hazard : Not classified (not applicable)

Symptoms/injuries after inhalation : Dust inhalation: Coughing. Heated fumes: Metal fume fever.

Symptoms/injuries after skin contact : Irritation may occur. Slight irritation. Red skin.

Symptoms/injuries after eye contact : Irritation may occur. Eye irritation. Redness of the eye tissue.

Symptoms/injuries after ingestion : Ingestion of large quantities: Irritation of the gastric/intestinal mucosa.

Chronic symptoms : Continuous, prolonged, or repeated exposures: Coughing. Respiratory difficulties. Impairment of the nervous system. Feeling of weakness. Loss of appetite. Behavioral disturbances. Slurred speech. Movement disturbances. Myasthenia. Tremor. Impaired concentration. Emotional instability.

SECTION 12: Ecological information

12.1. Toxicity

- Ecology – general : Toxic to aquatic life with long lasting effects.
- Ecology – water : Mild water pollutant (surface water). Harmful to fishes. Toxic to invertebrates (Daphnia). Can cause pH Shift.

Manganese Sulfate Monohydrate (10034-96-5)

LC50 fish 1	2850 mg/l (96 h; Colisa fasciatus; Anhydrous form)
EC50 Daphnia 1	8.28 mg/l (48 h; Daphnia magna; Anhydrous form)
LC50 fish 2	33.8 mg/l (96 h; Pimephales promelas; Anhydrous form)
EC50 Daphnia 2	10 mg/l (24 h; Daphnia magna; Anhydrous form)
ErC50 (algae)	61 mg/l (72 h; Desmodesmus subspicatus) (OECD 201)
NOEC (chronic)	1 mg/l (Desmodesmus subspicatus) (OECD 201)
Threshold limit algae 1	25.7 mg/l (Phaeodactylum; Anhydrous)

12.2. Persistence and degradability

Manganese Sulfate Monohydrate (10034-96-5)

Persistence and degradability	Biodegradability: not applicable.
Biochemical oxygen demand (BOD)	Not applicable
Chemical oxygen demand (COD)	Not applicable
ThOD	Not applicable
BOD (% of ThOD)	Not applicable

12.3. Bioaccumulative potential

No additional information available

12.4. Mobility in soil

No additional information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

- Waste disposal recommendations : Remove waste in accordance with local and/or national regulations. Offer surplus and non-recyclable solutions to a licensed disposal company. Dispose of contaminated packing material as unused product.

SECTION 14: Transport information

Department of Transportation (DOT)

- DOT (US) : Not regulated for ground transport



Transport by sea

- Proper shipping name (IMDG) : UN 3077, Environmentally Hazardous Substance, Solid, n.o.s. (manganese sulfate monohydrate), 9, PG III
- EmS-No : F-A, S-F

Air transport

- Proper shipping name (IATA) : UN 3077, Environmentally Hazardous Substance, Solid, n.o.s. (manganese sulfate monohydrate), 9, PG III

Additional air and sea transport information

UN-No.	:	3077
Proper Shipping Name	:	Environmentally Hazardous Substance, Solid, n.o.s. (manganese sulfate monohydrate), 9, PG III
Class (UN)	:	9
Hazard labels (UN)	:	
Packing group (UN)	:	III
Marine pollutant (Y/N)	:	Y
Dangerous for the environment	:	

SECTION 15: Regulatory information

15.1. US Federal regulations

SARA 302 : Not applicable

SARA 313
Manganese Sulfate Monohydrate (CAS No. 10034-95-5)

SARA 311/312
Chronic Health Hazard

CERCLA Reportable Quantities (RQ) : Not applicable

15.3. US State regulations

Manganese Sulfate Monohydrate (10034-95-5)

State or local regulations	U.S. – New Jersey – Right to Know Hazardous Substance List U.S. – Pennsylvania – RTK (Right to Know) List
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SECTION 16: Other information

Full Text of H-phrases:

Aquatic Chronic 2	Hazardous to the aquatic environment – Chronic Hazard Category 2
STOT RE 2	Specific target organ toxicity (repeated exposure) Category 2
H373	May cause damage to organs through prolonged or repeated exposure
H411	Toxic to the aquatic environment with long lasting effects



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National Fire Protection Rating (NFPA)

HEALTH*	0
FLAMMABILITY	0
INSTABILITY	0
4 = Severe 3 = Serious 2 = Moderate 1 = Slight 0 = Minimal	

*Substance not classified as Acute Health Danger, but may pose Chronic Health Danger

HMIS III Ratings

HEALTH	0
FLAMMABILITY	0
PHYSICAL HAZARD	0
4 = Severe 3 = Serious 2 = Moderate 1 = Slight 0 = Minimal	

MSDS US

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