

Issuing Date 02-Dec-2025

Revision date 02-Dec-2025

Revision Number 1

## 1. Identification

**Product identifier**

**Product Name** MicroSync Manganese

**Other means of identification**

**Recommended use of the chemical and restrictions on use**

**Recommended use** Fertilizer.

**Restrictions on use** No information available

**Details of the supplier of the safety data sheet**

**Manufacturer Address**

Verdesian Life Sciences U.S., LLC  
1001 Winstead Drive, Suite 480  
Cary, NC 27513  
United States  
Telephone: 1-800-868-6446

**E-mail** sds@vlsci.com

**Emergency telephone number**

**Emergency Telephone** INFOTRAC 1-800-535-5053 (North America)  
INFOTRAC +1-352-323-3500 (International)

## 2. Hazard(s) identification

**Classification**

|  |            |
|--|------------|
| Specific target organ toxicity (repeated exposure) | Category 2 |
|--|------------|

**Hazards not otherwise classified (HNOC)**

Not applicable.

**Label elements**



Warning

**Hazard statements**  
May cause damage to organs through prolonged or repeated exposure.

**Precautionary Statements - Prevention**

Do not breathe dust.

**Precautionary Statements - Response**

Get medical advice/attention if you feel unwell.

**Precautionary Statements - Disposal**

Dispose of contents and container in accordance with local, regional, national, and international regulations as applicable.

**Other information**

Harmful to aquatic life with long lasting effects.

**3. Composition/information on ingredients****Substance**

Not applicable.

**Mixture**

| Chemical name                 | CAS No.    | Weight-% |
|-------------------------------|------------|----------|
| Bentonite                     | 1302-78-9  | 60 - 80  |
| Manganese sulfate monohydrate | 10034-96-5 | 20 - 40  |
| Quartz from Bentonite Clay    | 14808-60-7 | 3 - <5   |
| Manganese oxide (MnO)         | 1344-43-0  | 1 - <3   |
| Citric acid                   | 77-92-9    | 1 - <3   |

\*The exact percentage (concentration) of composition has been withheld as a trade secret.

**4. First-aid measures****Description of first aid measures**

|                     |  |
|---------------------|--|
| <b>Inhalation</b>   | Remove to fresh air.   |
| <b>Eye contact</b>  | Rinse thoroughly with plenty of water for at least 15 minutes, lifting lower and upper eyelids. Consult a physician. |
| <b>Skin contact</b> | Wash skin with soap and water.   |
| <b>Ingestion</b>    | Rinse mouth.   |

**Most important symptoms and effects, both acute and delayed**

|                            |  |
|----------------------------|--|
| <b>Symptoms</b>            | No information available.  |
| <b>Effects of Exposure</b> | May cause damage to organs through prolonged or repeated exposure. |

**Indication of any immediate medical attention and special treatment needed**

|                           |                        |
|---------------------------|------------------------|
| <b>Note to physicians</b> | Treat symptomatically. |
|---------------------------|------------------------|

**5. Fire-fighting measures**

|                                     |   |
|-------------------------------------|---|
| <b>Suitable Extinguishing Media</b> | Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. |
|-------------------------------------|---|

|   |  |
|---|--|
| <b>Unsuitable extinguishing media</b>                                 | Do not scatter spilled material with high pressure water streams.  |
| <b>Specific hazards arising from the chemical</b>                     | No information available.  |
| <b>Explosion data</b>   |  |
| <b>Sensitivity to mechanical impact</b>                               | None.  |
| <b>Sensitivity to static discharge</b>                                | None.  |
| <b>Special protective equipment and precautions for fire-fighters</b> | Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Use personal protection equipment. |

## 6. Accidental release measures

### Personal precautions, protective equipment and emergency procedures

**Personal precautions** Ensure adequate ventilation.

### Methods and material for containment and cleaning up

**Methods for containment** Prevent further leakage or spillage if safe to do so.

**Methods for cleaning up** Pick up and transfer to properly labeled containers.

**Prevention of secondary hazards** Clean contaminated objects and areas thoroughly observing environmental regulations.

## 7. Handling and storage

### Precautions for safe handling

**Advice on safe handling** Handle in accordance with good industrial hygiene and safety practice.

**General hygiene considerations** Handle in accordance with good industrial hygiene and safety practice.

### Conditions for safe storage, including any incompatibilities

**Storage Conditions** Keep container tightly closed in a dry and well-ventilated place.

## 8. Exposure controls/personal protection

### Control Parameters

**Exposure Limits** The following ingredients are the only ingredients of the product above the cut-off level (or level that contributes to the hazard classification of the mixture) which have an exposure limit applicable in the region for which this safety data sheet is intended or other recommended limit. At this time, the other relevant constituents have no known exposure limits from the sources listed here.

| Chemical name                               | ACGIH TLV  | OSHA PEL  | NIOSH   |
|---|--|---|---|
| Bentonite<br>1302-78-9                      | TWA: 1 mg/m <sup>3</sup> respirable particulate matter   | -   | -   |
| Manganese sulfate monohydrate<br>10034-96-5 | TWA: 0.02 mg/m <sup>3</sup> Mn respirable particulate matter<br>TWA: 0.1 mg/m <sup>3</sup> Mn inhalable particulate matter | (vacated) Ceiling: 5 mg/m <sup>3</sup><br>Ceiling: 5 mg/m <sup>3</sup> Mn | IDLH: 500 mg/m <sup>3</sup> Mn<br>TWA: 1 mg/m <sup>3</sup> Mn<br>STEL: 3 mg/m <sup>3</sup> Mn |
| Quartz from Bentonite Clay                  | TWA: 0.025 mg/m <sup>3</sup> respirable  | TWA: 50 µg/m <sup>3</sup>   | IDLH: 50 mg/m <sup>3</sup> respirable   |

|                                    |  |  |   |
|------------------------------------|--|--|---|
| 14808-60-7                         | particulate matter   | (vacated) TWA: 0.1 mg/m <sup>3</sup><br>respirable dust<br>: (250)/(%SiO <sub>2</sub> + 5) mppcf<br>TWA respirable fraction<br>: (10)/(%SiO <sub>2</sub> + 2) mg/m <sup>3</sup><br>TWA respirable fraction | dust<br>TWA: 0.05 mg/m <sup>3</sup> respirable<br>dust  |
| Manganese oxide (MnO)<br>1344-43-0 | TWA: 0.02 mg/m <sup>3</sup> Mn<br>respirable particulate matter<br>TWA: 0.1 mg/m <sup>3</sup> Mn inhalable<br>particulate matter | (vacated) Ceiling: 5 mg/m <sup>3</sup><br>Ceiling: 5 mg/m <sup>3</sup> Mn  | IDLH: 500 mg/m <sup>3</sup> Mn<br>TWA: 1 mg/m <sup>3</sup> Mn<br>STEL: 3 mg/m <sup>3</sup> Mn |

**Biological occupational exposure limits** This product, as supplied, contains materials that do not have reportable biological exposure limits or are not subject to the reporting requirements of the local jurisdiction.

### Appropriate engineering controls

**Engineering controls** Showers  
Eyewash stations  
Ventilation systems.

### Individual protection measures, such as personal protective equipment

**Eye/face protection** Wear safety glasses with side shields (or goggles).

**Hand protection** Wear suitable gloves.

**Skin and body protection** Wear suitable protective clothing.

**Respiratory protection** Use appropriate respiratory protection.

## **9. Physical and chemical properties**

### Information on basic physical and chemical properties

**Physical state** Solid  
**Color** No information available  
**Odor (includes odor threshold)** No information available

| <u>Property</u>  | <u>Values</u>     | <u>Remarks • Method</u> |
|--|-------------------|-------------------------|
| <b>Melting point / freezing point</b>                            | No data available | None known              |
| <b>Boiling point (or initial boiling point or boiling range)</b> | No data available | None known              |
| <b>Flammability</b>  | No data available | None known              |
| <b>Flammability Limit in Air</b>                                 |                   | None known              |
| <b>Upper flammability or explosive limits</b>                    | No data available |                         |
| <b>Lower flammability or explosive limits</b>                    | No data available |                         |
| <b>Flash point</b>   | No data available | None known              |
| <b>Autoignition temperature</b>                                  | No data available | None known              |
| <b>Decomposition temperature</b>                                 | No data available | None known              |
| <b>SADT (°C)</b>   | No data available | None known              |
| <b>pH</b>  | No data available | None known              |
| <b>pH (as aqueous solution)</b>                                  | No data available | None known              |
| <b>Kinematic viscosity</b>                                       | No data available | None known              |
| <b>Dynamic viscosity</b>   | No data available | None known              |
| <b>Solubility</b>  | No data available | None known              |
| <b>Water solubility</b>  | No data available | None known              |
| <b>Partition coefficient n-octanol/water (log value)</b>         | No data available | None known              |
| <b>Vapor pressure (includes evaporation rate)</b>                | No data available | None known              |
| <b>Evaporation rate</b>  | No data available | None known              |
| <b>Density and/or relative density</b>                           | No data available | None known              |
| <b>Bulk density</b>  | No data available |                         |

|                            |                   |            |
|----------------------------|-------------------|------------|
| Liquid Density             | No data available |            |
| Relative vapor density     | No data available | None known |
| Particle characteristics   |                   | None known |
| Particle Size              | No data available |            |
| Particle Size Distribution | No data available |            |

Other information**10. Stability and reactivity**

|                                    |   |
|------------------------------------|---|
| Reactivity                         | No information available.                 |
| Chemical stability                 | Stable under normal conditions.           |
| Possibility of hazardous reactions | None under normal processing.             |
| Conditions to avoid                | None known based on information supplied. |
| Incompatible materials             | None known based on information supplied. |
| Hazardous decomposition products   | None known based on information supplied. |

**11. Toxicological information**Information on likely routes of exposure

|              |   |
|--------------|---|
| Inhalation   | Specific test data for the substance or mixture is not available. |
| Eye contact  | Specific test data for the substance or mixture is not available. |
| Skin contact | Specific test data for the substance or mixture is not available. |
| Ingestion    | Specific test data for the substance or mixture is not available. |

Symptoms related to the physical, chemical and toxicological characteristics

|                |                           |
|----------------|---------------------------|
| Symptoms       | No information available. |
| Acute toxicity | No information available. |

Numerical measures of toxicity

The following ATE values have been calculated for the mixture

|                               |                 |
|-------------------------------|-----------------|
| ATEmix (oral)                 | 7,213.30 mg/kg  |
| ATEmix (dermal)               | 99,999.00 mg/kg |
| ATEmix (inhalation-gas)       | 99,999.00 ppm   |
| ATEmix (inhalation-vapor)     | 99,999.00 mg/l  |
| ATEmix (inhalation-dust/mist) | 99,999.00 mg/l  |

**Component Information**

| Chemical name                 | CAS No.    | Oral LD50            | Dermal LD50           | Inhalation LC50         |
|-------------------------------|------------|----------------------|-----------------------|-------------------------|
| Bentonite                     | 1302-78-9  | > 5000 mg/kg ( Rat ) | -                     | -                       |
| Manganese sulfate monohydrate | 10034-96-5 | = 2150 mg/kg ( Rat ) | -                     | > 4.45 mg/L ( Rat ) 4 h |
| Manganese oxide (MnO)         | 1344-43-0  | > 2000 mg/kg ( Rat ) | -                     | > 5.35 mg/L ( Rat ) 4 h |
| Citric acid                   | 77-92-9    | = 3 g/kg ( Rat )     | > 2,000 mg/kg ( Rat ) | -                       |

**Delayed and immediate effects as well as chronic effects from short and long-term exposure**

**Skin corrosion/irritation** No information available.

**Serious eye damage/eye irritation** No information available.

**Respiratory or skin sensitization** No information available.

**Germ cell mutagenicity** No information available.

**Carcinogenicity** No information available.

| Chemical name              | CAS No.    | ACGIH | IARC    | NTP   | OSHA |
|----------------------------|------------|-------|---------|-------|------|
| Quartz from Bentonite Clay | 14808-60-7 | A2    | Group 1 | Known | X    |

**Reproductive toxicity** No information available.

**STOT - single exposure** No information available.

**STOT - repeated exposure** May cause damage to organs through prolonged or repeated exposure.

**Aspiration hazard** No information available.

**Other adverse effects** No information available.

**Interactive effects** No information available.

**12. Ecological information**

**Ecotoxicity** Harmful to aquatic life with long lasting effects.

| Chemical name          | Algae/aquatic plants | Fish   | Toxicity to microorganisms | Crustacea |
|------------------------|----------------------|--|----------------------------|-----------|
| Bentonite<br>1302-78-9 | -                    | LC50: =19000mg/L<br>(96h, Oncorhynchus mykiss) | -                          | -         |
| Citric acid<br>77-92-9 | -                    | LC50: =1,516mg/L (96h,<br>Lepomis macrochirus) | -                          | -         |

**Persistence and degradability** No information available.

**Bioaccumulation****Component Information**

| Chemical name          | Partition coefficient |
|------------------------|-----------------------|
| Citric acid<br>77-92-9 | -1.72                 |

**Other adverse effects** No information available.

**13. Disposal considerations****Disposal methods**

**Waste from residues/unused products** Dispose of in accordance with local regulations. Dispose of waste in accordance with environmental legislation.

Contaminated packaging

Do not reuse empty containers.

**14. Transport information****DOT**

Not regulated

**IATA**

Not regulated

**IMDG**

Not regulated

**15. Regulatory information**

Contact supplier for inventory compliance status

**16. Other information****NFPA**

Health hazards 0

Flammability 0

Instability 0

Special hazards -

**HMIS**

Health hazards 0

Flammability 0

Physical hazards 0

Personal protection -

**Key or legend to abbreviations and acronyms used in the safety data sheet***List may include phrases which are not applicable to this product***Legend**

|         |   |
|---------|---|
| ACGIH   | American Conference of Governmental Industrial Hygienists   |
| ADN     | Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (Europe)     |
| ADR     | Agreement concerning the International Carriage of Dangerous Goods by Road (Europe)                 |
| AIIC    | Australian Inventory of Industrial Chemicals  |
| ATE     | Acute Toxicity Estimate   |
| ASTM    | American Society for the Testing of Materials   |
| bar     | Biological Reference Values for Chemical Compounds in the Work Area                                 |
| BAT     | Biological tolerance values for occupational exposure   |
| BEL     | Biological exposure limits  |
| bw      | Body weight   |
| Ceiling | Maximum limit value   |
| CMR     | Carcinogen, Mutagen or Reproductive Toxicant  |
| DOT     | Department of Transportation (United States)  |
| DSL     | Domestic Substances List (Canada)   |
| EmS     | Emergency Schedule  |
| ENCS    | Existing and New Chemical Substances (Japan)  |
| EPA     | Environmental Protection Agency   |
| GHS     | Globally Harmonized System  |
| HMIS    | Hazardous Materials Identification System   |
| IARC    | International Agency for Research on Cancer   |
| IATA    | International Air Transport Association   |
| IBC     | International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk |
| ICAO    | International Civil Aviation Organization   |
| IECSC   | Inventory of Existing Chemical Substances in China  |
| IMDG    | International Maritime Dangerous Goods  |
| IMO     | International Maritime Organization   |
| ISO     | International Organization for Standardization  |
| KECI    | Korean Existing Chemicals Inventory   |
| LC50    | Lethal Concentration to 50% of a test population  |
| LD50    | Lethal Dose to 50% of a test population (Median Lethal Dose)  |
| MARPOL  | International Convention for the Prevention of Pollution from Ships                                 |

|         |   |
|---------|---|
| NFPA    | National Fire Protection Association  |
| NIOSH   | National Institute for Occupational Safety and Health                               |
| n.o.s.  | Not Otherwise Specified   |
| NOAEC   | No Observed Adverse Effect Concentration  |
| NOAEL   | No Observed Adverse Effect Level  |
| NOELR   | No Observable Effect Loading Rate   |
| NTP     | National Toxicology Program (United States)   |
| NZIoC   | New Zealand Inventory of Chemicals  |
| OECD    | Organization for Economic Cooperation and Development                               |
| OEL     | Occupational exposure limits  |
| OSHA    | Occupational Safety and Health Administration of the US Department of Labor         |
| PBT     | Persistent, Bioaccumulative and Toxic substance                                     |
| PICCS   | Philippines Inventory of Chemicals and Chemical Substances                          |
| PMT     | Persistent, Mobile and Toxic  |
| PPE     | Personal protective equipment   |
| QSAR    | Quantitative Structure Activity Relationship  |
| RID     | Agreement concerning the International Carriage of Dangerous Goods by Rail (Europe) |
| SADT    | Self-Accelerating Decomposition Temperature   |
| SAR     | Structure-activity relationship   |
| SARA    | Superfund Amendments and Reauthorization Act  |
| SDS     | Safety Data Sheet   |
| SL      | Surface Limit   |
| STEL    | Short Term Exposure Limit   |
| STOT RE | Specific target organ toxicity - Repeated exposure                                  |
| STOT SE | Specific target organ toxicity - Single exposure                                    |
| TCSI    | Taiwan Chemical Substance Inventory   |
| TDG     | Transport of Dangerous Goods (Canada)   |
| TSCA    | Toxic Substances Control Act (United States)  |
| TWA     | Time-Weighted Average   |
| UN      | United Nations  |
| VOC     | Volatile organic compounds  |
| vPvB    | Very Persistent and Very Bioaccumulative  |
| vPvM    | Very Persistent and Very Mobile   |
| As      | Allergenic substance  |
| DS      | Dermal Sensitizer   |
| Ot      | Ototoxicant   |
| pOt     | Ototoxicant - potential to cause hearing disorders                                  |
| PS      | Photosensitizer   |
| RS      | Respiratory Sensitizer  |
| S       | Sensitizer  |
| poS     | Sensitizer - capable of causing occupational asthma                                 |
| Sa      | Simple asphyxiant   |
| Sd      | Skin designation  |
| pSd     | Skin designation - potential for cutaneous absorption                               |
| Sdv     | Skin designation - vacated  |
| Sk      | Skin notation   |
| dSk     | Skin notation - danger of cutaneous absorption                                      |
| pSk     | Skin notation - potential for cutaneous absorption                                  |

#### Key literature references and sources for data used to compile the SDS

Agency for Toxic Substances and Disease Registry (ATSDR)  
U.S. Environmental Protection Agency ChemView Database  
European Food Safety Authority (EFSA)  
Environmental Protection Agency  
Acute Exposure Guideline Level(s) (AELG(s))  
U.S. Environmental Protection Agency Federal Insecticide, Fungicide, and Rodenticide Act  
U.S. Environmental Protection Agency High Production Volume Chemicals  
Food Research Journal  
Hazardous Substance Database  
International Uniform Chemical Information Database (IUCLID)  
National Institute of Technology and Evaluation (NITE)

Australia National Industrial Chemicals Notification and Assessment Scheme (NICNAS)  
NIOSH (National Institute for Occupational Safety and Health)  
National Library of Medicine's ChemID Plus (NLM CIP)  
National Library of Medicine's PubMed database (NLM PUBMED)  
U.S. National Toxicology Program (NTP)  
New Zealand's Chemical Classification and Information Database (CCID)  
Organization for Economic Co-operation and Development Environment, Health, and Safety Publications  
Organization for Economic Co-operation and Development High Production Volume Chemicals Program  
Organization for Economic Co-operation and Development Screening Information Data Set  
World Health Organization

**Issuing Date** 02-Dec-2025  
**Revision date** 02-Dec-2025  
**Revision Note** No information available.

**Disclaimer**

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

**End of Safety Data Sheet**