SECTION 1: Identification

1.1. Identification

Product form : Substance
Substance name : Manganese Sulfate Monohydrate
CAS-No. : 10034-96-5
Formula : MnSO₄ · H₂O

1.2. Recommended use and restrictions on use

Use of the substance/mixture : Laboratory Reagent
Nutrient; Dietary Supplement; Treatment of potable water for radium removal

1.3. Supplier

Manufacturer
Jost Chemical Co.
8150 Lackland Rd.
Saint Louis, Missouri 63114
T 314-428-4300 - F 314-428-4366
sds@jostchemical.com - www.jostchemical.com

1.4. Emergency telephone number

Emergency number : For Hazardous Materials [or Dangerous Goods] Incident Spill, Leak, Fire, Exposure, or Accident
Call CHEMTREC Day or Night
United States and Canada: 1-800-424-9300 / +1 703-527-3887
Global: +1 703-741-5970

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS US classification
Acute toxicity (oral) H302 Harmful if swallowed
Category 4
Serious eye damage/eye irritation Category 1 H318 Causes serious eye damage

Full text of H statements : see section 16

2.2. GHS Label elements, including precautionary statements

GHS US labeling
Hazard pictograms (GHS US) : 

Signal word (GHS US) : Danger
Hazard statements (GHS US) : H302 - Harmful if swallowed
H318 - Causes serious eye damage

Precautionary statements (GHS US) : P264 - Wash hands, forearms and face thoroughly after handling.
P270 - Do not eat, drink or smoke when using this product.
P280 - Wear protective gloves/protective clothing/eye protection/face protection.
P301+P312 - If swallowed: Call a poison center or doctor if you feel unwell
P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P310 - Immediately call a poison center or doctor
P330 - Rinse mouth.
P501 - Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation

2.3. Other hazards which do not result in classification

Other hazards not contributing to the classification : None under normal conditions.
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according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

2.4. Unknown acute toxicity (GHS US)
Not applicable

SECTION 3: Composition/Information on ingredients

3.1. Substances
Substance type : Mono-constituent

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
<th>GHS US classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manganese Sulfate Monohydrate (Main constituent)</td>
<td>(CAS-No.) 10034-96-5</td>
<td>100</td>
<td>Acute Tox. 4 (Oral), H302 Eye Dam. 1, H318</td>
</tr>
</tbody>
</table>

Full text of hazard classes and H-statements : see section 16

3.2. Mixtures
Not applicable

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing. Remove the victim into fresh air. Respiratory problems: consult a doctor/medical service.

First-aid measures after skin contact : Rinse with water. Soap may be used. Take victim to a doctor if irritation persists. Wash skin with plenty of water.

First-aid measures after eye contact : Rinse with water. Remove contact lenses, if present and easy to do. Continue rinsing. Do not apply neutralizing agents. Take victim to an ophthalmologist if irritation persists. Rinse eyes with water as a precaution.


4.2. Most important symptoms and effects (acute and delayed)
Potential Adverse human health effects and symptoms

<table>
<thead>
<tr>
<th>Symptoms/effects after inhalation</th>
<th>AFTER INHALATION OF DUST: Coughing. ON HEATING: Metal fume fever.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptoms/effects after skin contact</td>
<td>Slight irritation. Red skin.</td>
</tr>
<tr>
<td>Symptoms/effects after eye contact</td>
<td>Redness of the eye tissue.</td>
</tr>
<tr>
<td>Symptoms/effects after ingestion</td>
<td>AFTER INGESTION OF HIGH QUANTITIES: Irritation of the gastric/intestinal mucosa.</td>
</tr>
</tbody>
</table>

4.3. Immediate medical attention and special treatment, if necessary
Treat symptomatically.

SECTION 5: Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media

5.2. Specific hazards arising from the chemical
Fire hazard : DIRECT FIRE HAZARD: Non combustible.
Explosion hazard : No data available on direct explosion hazard. No data available on indirect explosion hazard.
Reactivity : The product is non-reactive under normal conditions of use, storage and transport.

5.3. Special protective equipment and precautions for fire-fighters
Precautionary measures fire : Exposure to fire/heat: keep upwind. Exposure to fire/heat: consider evacuation. Exposure to fire/heat: have neighborhood close doors and windows.
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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.


SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel


Measures in case of dust release: In case of dust production: keep upwind. Dust production: have neighborhood close doors and windows.

6.1.2. For emergency responders

Protective equipment: Do not attempt to take action without suitable protective equipment. For further information 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 product, pump into suitable containers. Plug the leak, cut off the supply. Dam up the solid spill. Knock down/dilute dust cloud with water spray. Collect spillage.

Methods for cleaning up: Mechanically recover the product. Stop dust cloud by covering with sand/earth. Scoop solid spill into closing containers. Carefully collect the spill/leftovers. Take collected spill to manufacturer/competent authority. Clean contaminated surfaces with an excess of water. Wash clothing and equipment after handling.

Other information: Dispose of materials or solid residues at an authorized site.

6.4. Reference to other sections

For further information refer to section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling: Ensure good ventilation of the work station. Wear personal protective equipment. Avoid raising dust. Keep away from naked flames/heat. Measure the concentration in the air regularly. Carry operations in the open/under local exhaust/ventilation or with respiratory protection. Comply with the legal requirements. Clean contaminated clothing. Thoroughly clean/dry the installation before use. Do not discharge the waste into the drain. Do not breathe dust/fume/gas/mist/vapors/spray.

Hygiene measures: Observe very strict hygiene - avoid contact. Keep container tightly closed. 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: Store in a well-ventilated place. Keep cool.

Incompatible materials: Strong oxidizers. Metals. Reactive metals (Al, K, Zn ...).

Heat-ignition: KEEP SUBSTANCE AWAY FROM: heat sources.

Information on mixed storage: KEEP SUBSTANCE AWAY FROM: oxidizing agents. water/moisture.

Storage area: Store in a dry area. Unauthorized persons are not admitted. Meet the legal requirements.

Special rules on packaging: SPECIAL REQUIREMENTS: closing, watertight, dry, correctly labelled. meet the legal requirements. Secure fragile packagings in solid containers.

Packaging materials: SUITABLE MATERIAL: cardboard. plastics. glass.
**Manganese Sulfate Monohydrate**

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**SECTION 8: Exposure controls/personal protection**

### 8.1. Control parameters

<table>
<thead>
<tr>
<th>Manganese Sulfate Monohydrate (10034-96-5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DNEL</td>
</tr>
<tr>
<td>PNEC</td>
</tr>
</tbody>
</table>

**Control parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DNEL</td>
<td>0.2 mg/m³ (Long-term - systemic effects, inhalation, workers)</td>
</tr>
<tr>
<td>PNEC</td>
<td>0.0128 mg/l (aqua, freshwater)</td>
</tr>
</tbody>
</table>

### 8.2. Appropriate engineering controls

<table>
<thead>
<tr>
<th>Appropriate engineering controls</th>
<th>Ensure good ventilation of the work station.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental exposure controls</td>
<td>Avoid release to the environment.</td>
</tr>
</tbody>
</table>

### 8.3. Individual protection measures/Personal protective equipment

**Personal protective equipment:**


**Materials for protective clothing:**

GIVE GOOD RESISTANCE: butyl rubber. PVC

**Hand protection:**

Gloves

**Eye protection:**

Safety glasses. In case of dust production: protective goggles. Safety glasses

**Skin and body protection:**

Protective clothing

**Respiratory protection:**

Dust production: dust mask with filter type P3

**Personal protective equipment symbol(s):**

---

**SECTION 9: Physical and chemical properties**

### 9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Solid</td>
</tr>
<tr>
<td>Appearance</td>
<td>Powder. Granular solid.</td>
</tr>
<tr>
<td>Color</td>
<td>Rose</td>
</tr>
<tr>
<td>Odor</td>
<td>Odorless</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>pH</td>
<td>3.0 - 3.5 (5 %)</td>
</tr>
<tr>
<td>Melting point</td>
<td>700 °C</td>
</tr>
<tr>
<td>Freezing point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Boiling point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Flash point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Relative evaporation rate (butyl acetate=1)</td>
<td>No data available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Non flammable</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative vapor density at 20 °C</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Relative density</td>
<td>3</td>
</tr>
</tbody>
</table>
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Specific gravity / density: 2950 kg/m³
Molecular mass: 169.01 g/mol
Solubility: Soluble in water.
  Water: 100 g/100ml
Log Pow: No data available
Auto-ignition temperature: Not applicable
Decomposition temperature: > 117 °C
Viscosity, kinematic: No data available
Viscosity, dynamic: No data available
Explosion limits: Not applicable
Explosive properties: No data available
Oxidizing properties: No data available

9.2. Other information
VOC content: 0 %
Other properties: Hygroscopic. Acid reaction.

SECTION 10: Stability and reactivity

10.1. Reactivity
The product is non-reactive under normal conditions of use, storage and transport.

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
Oxidizing agent. Powdered metals.

10.6. Hazardous decomposition products
Sulphur oxides. Metallic oxides.

SECTION 11: Toxicological information

11.1. Information on toxicological effects
Acute toxicity (oral): Oral: Harmful if swallowed. (Based on available data, the classification criteria are not met)
Acute toxicity (dermal): Not classified
Acute toxicity (inhalation): Not classified

Manganese Sulfate Monohydrate (10034-96-5)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD50 oral rat</td>
<td>2150 mg/kg (Published data)</td>
</tr>
<tr>
<td>LC50 inhalation rat (mg/l)</td>
<td>&gt; 4.45 mg/l/4h</td>
</tr>
<tr>
<td>ATE US (oral)</td>
<td>500 mg/kg body weight</td>
</tr>
</tbody>
</table>

Skin corrosion/irritation: Not classified (Based on available data, the classification criteria are not met)
  pH: 3.0 - 3.5 (5 %)

Serious eye damage/irritation: Causes serious eye damage.
  pH: 3.0 - 3.5 (5 %)

Respiratory or skin sensitization: Not classified (Based on available data, the classification criteria are not met)

Germ cell mutagenicity: Not classified (Based on available data, the classification criteria are not met)

Carcinogenicity: Not classified (Based on available data, the classification criteria are not met)

Reproductive toxicity: Not classified (Based on available data, the classification criteria are not met)

Specific target organ toxicity – single exposure: Not classified (Based on available data, the classification criteria are not met)

Specific target organ toxicity – repeated exposure: Not classified
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Aspiration hazard: Not classified (Not applicable)

Viscosity, kinematic: No data available

Likely routes of exposure: Skin and eye contact.

Potential Adverse human health effects and symptoms:
- Slightly harmful if swallowed. Slightly irritant to skin.
- After Inhalation of Dust: Coughing. On heating: Metal fume fever.
- After Skin Contact: Slight irritation. Red skin.
- After Eye Contact: Redness of the eye tissue.
- After Ingestion of High Quantities: Irritation of the gastric/intestinal mucosa.

SECTION 12: Ecological Information

12.1. Toxicity
Ecology - general: Dangerous for the environment. Toxic to aquatic life with long lasting effects. Toxic to aquatic life.
Ecology - air: Not classified as dangerous for the ozone layer (Regulation (EC) No 1005/2009).

<table>
<thead>
<tr>
<th>Manganese Sulfate Monohydrate (10034-96-5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC50 fish 1</td>
</tr>
<tr>
<td>EC50 Daphnia 1</td>
</tr>
<tr>
<td>ErC50 (algae)</td>
</tr>
<tr>
<td>NOEC (chronic)</td>
</tr>
</tbody>
</table>

12.2. Persistence and degradability

<table>
<thead>
<tr>
<th>Manganese Sulfate Monohydrate (10034-96-5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Persistence and degradability Biodegradability: not applicable.</td>
</tr>
<tr>
<td>Chemical oxygen demand (COD) Not applicable</td>
</tr>
<tr>
<td>ThOD Not applicable</td>
</tr>
<tr>
<td>BOD (% of ThOD) Not applicable</td>
</tr>
</tbody>
</table>

12.3. Bioaccumulative potential
No additional information available

12.4. Mobility in soil
No additional information available

12.5. Other adverse effects
No additional information available

SECTION 13: Disposal Considerations

13.1. Disposal methods
Waste treatment methods: Dispose of contents/container in accordance with licensed collector’s sorting instructions.
Product/Packaging disposal recommendations: Remove waste in accordance with local and/or national regulations. Hazardous waste shall not be mixed together with other waste. Different types of hazardous waste shall not be mixed together if this may entail a risk of pollution or create problems for the further management of the waste. Hazardous waste shall be managed responsibly. All entities that store, transport or handle hazardous waste shall take the necessary measures to prevent risks of pollution or damage to people or animals. Recycle/reuse. Remove to an authorized dump (Class I). Precipitate/make insoluble.

SECTION 14: Transport information

Department of Transportation (DOT)
In accordance with DOT
Not regulated

Transportation of Dangerous Goods
Transport document description: 3077 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Manganese Sulfate Monohydrate), 9, III
UN-No. (TDG): 3077
Proper Shipping Name (Transportation of Dangerous Goods): ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.
TDG Primary Hazard Classes: 9 - Class 9 - Miscellaneous Products, Substances or Organisms
Packing group: III - Minor Danger

Transport by sea
Transport document description (IMDG): UN 3077 environmentally hazardous substance, solid, n.o.s. (Manganese Sulfate Monohydrate), 9, III, MARINE POLLUTANT
UN-No. (IMDG): 3077
Proper Shipping Name (IMDG): environmentally hazardous substance, solid, n.o.s.
Class (IMDG): 9 - Miscellaneous dangerous substances and articles
Packing group (IMDG): III - substances presenting low danger
Limited quantities (IMDG): 5 kg
EmS-No. (1): F-A
EmS-No. (2): S-F

Air transport
Transport document description (IATA): UN 3077 Environmentally hazardous substance, solid, n.o.s. (Manganese Sulfate Monohydrate), 9, III
UN-No. (IATA): 3077
Proper Shipping Name (IATA): Environmentally hazardous substance, solid, n.o.s.
Class (IATA): 9 - Miscellaneous Dangerous Goods
Packing group (IATA): III - Minor Danger

SECTION 15: Regulatory information

15.1. US Federal regulations
Manganese Sulfate Monohydrate (10034-96-5)
Not listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2. International regulations

CANADA
Manganese Sulfate Monohydrate (10034-96-5)
Not listed on the Canadian DSL (Domestic Substances List)/NDSL (Non-Domestic Substances List)

EU-Regulations
No additional information available

National regulations
No additional information available

15.3. US State regulations
No additional information available
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SECTION 16: Other information

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Revision date : 07/09/2019

Full text of H-phrases:

<table>
<thead>
<tr>
<th>H302</th>
<th>Harmful if swallowed</th>
</tr>
</thead>
<tbody>
<tr>
<td>H318</td>
<td>Causes serious eye damage</td>
</tr>
</tbody>
</table>

NFPA health hazard : 0 - Materials that, under emergency conditions, would offer no hazard beyond that of ordinary combustible materials.

NFPA fire hazard : 0 - Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand.

NFPA reactivity : 0 - Material that in themselves are normally stable, even under fire conditions.

Hazard Rating
Health : 2 Moderate Hazard - Temporary or minor injury may occur
        * - Chronic (long-term) health effects may result from repeated overexposure
Flammability : 0 Minimal Hazard - Materials that will not burn
Physical : 1 Slight Hazard - Materials that are normally stable but can become unstable (self-react) at high temperatures and pressures. Materials may react non-violently with water or undergo hazardous polymerization in the absence of inhibitors.

SDS US (GHS HazCom 2012)

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.