SAFETY DATA SHEET

1. Identification

Product Name Manganese(II) nitrate tetrahydrate
Cat No. : AC193460000; AC193460010; AC193462500
Synonyms No information available
Recommended Use Laboratory chemicals.
Uses advised against No Information available

2. Hazard(s) identification

Classification
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

<table>
<thead>
<tr>
<th>Classification</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxidizing solids</td>
<td>Category 2</td>
</tr>
<tr>
<td>Acute oral toxicity</td>
<td>Category 4</td>
</tr>
<tr>
<td>Skin Corrosion/irritation</td>
<td>Category 1 C</td>
</tr>
<tr>
<td>Serious Eye Damage/Eye Irritation</td>
<td>Category 1</td>
</tr>
<tr>
<td>Specific target organ toxicity (single exposure)</td>
<td>Category 3</td>
</tr>
<tr>
<td>Target Organs - Respiratory system.</td>
<td></td>
</tr>
<tr>
<td>Specific target organ toxicity - (repeated exposure)</td>
<td>Category 2</td>
</tr>
<tr>
<td>Target Organs - Brain.</td>
<td></td>
</tr>
</tbody>
</table>

Label Elements
Signal Word Danger

Hazard Statements
May intensify fire; oxidizer
Harmful if swallowed
Causes severe skin burns and eye damage
May cause respiratory irritation
May cause damage to organs through prolonged or repeated exposure

Company
Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Entity / Business Name
Acros Organics
One Reagent Lane
Fair Lawn, NJ 07410

Emergency Telephone Number
For information US call: 001-800-ACROS-01
/ Europe call: +32 14 57 52 11
Emergency Number US:001-201-796-7100 / Europe: +32 14 57 52 99
CHEMTREC Tel. No.US:001-800-424-9300 / Europe:001-703-527-3887
Precautionary Statements

Prevention
Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product
Do not breathe dust/fume/gas/mist/vapors/spray
Wear protective gloves/protective clothing/eye protection/face protection
Use only outdoors or in a well-ventilated area
Keep away from heat/sparks/open flames/hot surfaces. - No smoking
Keep/Store away from clothing/ other combustible materials
Take any precaution to avoid mixing with combustibles

Response
Immediately call a POISON CENTER or doctor/physician

Inhalation
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

Skin
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
Wash contaminated clothing before reuse

Eyes
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

Ingestion
Rinse mouth
Do NOT induce vomiting

Fire
In case of fire: Use CO2, dry chemical, or foam for extinction

Storage
Store locked up
Store in a well-ventilated place. Keep container tightly closed

Disposal
Dispose of contents/container to an approved waste disposal plant

Hazards not otherwise classified (HNOC)
Harmful to aquatic life with long lasting effects
Corrosive to the respiratory tract

3. Composition / information on ingredients

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitric acid, manganese(2+) salt, tetrahydrate</td>
<td>20694-39-7</td>
<td>100</td>
</tr>
<tr>
<td>Manganese nitrate</td>
<td>10377-66-9</td>
<td>-</td>
</tr>
</tbody>
</table>

4. First-aid measures

General Advice
Show this safety data sheet to the doctor in attendance. Immediate medical attention is required.

Eye Contact
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Immediate medical attention is required. Keep eye wide open while rinsing.

Skin Contact
Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Call a physician immediately.
**Inhalation**
Move to fresh air. If not breathing, give artificial respiration. Call a physician or Poison Control Center immediately. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

**Ingestion**
Immediate medical attention is required. Do not induce vomiting. Drink plenty of water. Never give anything by mouth to an unconscious person.

**Most important symptoms/effects**
None reasonably foreseeable. Causes burns by all exposure routes. Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated: Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation.

**Notes to Physician**
Treat symptomatically.

### 5. Fire-fighting measures

**Suitable Extinguishing Media**
CO₂, dry chemical, dry sand, alcohol-resistant foam.

**Unsuitable Extinguishing Media**
No information available

- **Flash Point**
  - Method -
  - No information available

- **Autoignition Temperature**
  - Not applicable

- **Explosion Limits**
  - Upper
  - No data available
  - Lower
  - No data available

- **Oxidizing Properties**
  - Oxidizer

- **Sensitivity to Mechanical Impact**
  - No information available

- **Sensitivity to Static Discharge**
  - No information available

**Specific Hazards Arising from the Chemical**
The product causes burns of eyes, skin and mucous membranes. Oxidizer: Contact with combustible/organic material may cause fire. May ignite combustibles (wood paper, oil, clothing, etc.).

**Hazardous Combustion Products**
Nitrogen oxides (NOₓ)

**Protective Equipment and Precautions for Firefighters**
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

### 6. Accidental release measures

**Personal Precautions**
Use personal protective equipment. Evacuate personnel to safe areas. Avoid contact with skin, eyes and clothing.

**Environmental Precautions**
Should not be released into the environment. Do not allow material to contaminate ground water system. Do not flush into surface water or sanitary sewer system.

**Methods for Containment and Clean Up**
Sweep up or vacuum up spillage and collect in suitable container for disposal. Avoid dust formation. Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. Sweep up and shovel into suitable containers for disposal.

### 7. Handling and storage

**Handling**
Wear personal protective equipment. Do not get in eyes, on skin, or on clothing. Use only under a chemical fume hood. Do not breathe dust. Do not ingest. Keep away from clothing...
and other combustible materials.

Storage

Keep containers tightly closed in a dry, cool and well-ventilated place. Do not store near combustible materials. Corrosives area. To maintain product quality: Keep refrigerated.

8. Exposure controls / personal protection

Exposure Guidelines

<table>
<thead>
<tr>
<th>Component</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH IDLH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitric acid, manganese(2+) salt, tetrahydrate</td>
<td>TWA: 0.02 mg/m³ TWA: 0.1 mg/m³</td>
<td>(Vacated) Ceiling: 5 mg/m³ Ceiling: 5 mg/m³</td>
<td>IDLH: 500 mg/m³ TWA: 1 mg/m³ STEL: 3 mg/m³</td>
</tr>
<tr>
<td>Manganese nitrate</td>
<td>TWA: 0.02 mg/m³ TWA: 0.1 mg/m³</td>
<td>(Vacated) Ceiling: 5 mg/m³ Ceiling: 5 mg/m³</td>
<td>IDLH: 500 mg/m³ TWA: 1 mg/m³ STEL: 3 mg/m³</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Component</th>
<th>Quebec</th>
<th>Mexico OEL (TWA)</th>
<th>Ontario TWAEV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitric acid, manganese(2+) salt, tetrahydrate</td>
<td>TWA: 0.2 mg/m³</td>
<td>TWA: 0.2 mg/m³</td>
<td>TWA: 0.02 mg/m³ TWA: 0.1 mg/m³</td>
</tr>
<tr>
<td>Manganese nitrate</td>
<td>TWA: 0.2 mg/m³</td>
<td>TWA: 0.2 mg/m³</td>
<td>TWA: 0.02 mg/m³ TWA: 0.1 mg/m³</td>
</tr>
</tbody>
</table>

Legend

ACGIH - American Conference of Governmental Industrial Hygienists
OSHA - Occupational Safety and Health Administration
NIOSH IDLH: The National Institute for Occupational Safety and Health Immediately Dangerous to Life or Health

Engineering Measures

Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal Protective Equipment

Eye/face Protection

Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA’s eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin and body protection

Long sleeved clothing.

Respiratory Protection

Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Physical State</th>
<th>Solid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Light red</td>
</tr>
<tr>
<td>Odor</td>
<td>Strong</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>No information available</td>
</tr>
<tr>
<td>pH</td>
<td>No information available</td>
</tr>
<tr>
<td>Melting Point/Range</td>
<td>37 °C / 98.6 °F</td>
</tr>
<tr>
<td>Boiling Point/Range</td>
<td>No information available</td>
</tr>
<tr>
<td>Flash Point</td>
<td>No information available</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Flammability (solid,gas)</td>
<td>No information available</td>
</tr>
<tr>
<td>Flammability or explosive limits</td>
<td></td>
</tr>
<tr>
<td>Upper</td>
<td>No data available</td>
</tr>
<tr>
<td>Lower</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>No information available</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>
### Specific Gravity
No information available

### Solubility
Soluble in water

### Partition coefficient; n-octanol/water
No data available

### Autoignition Temperature
Not applicable

### Decomposition Temperature
> 140°C

### Viscosity
Not applicable

### Molecular Formula
Mn N2 O6 . 4 H2 O

### Molecular Weight
251.01

### Stability and reactivity

<table>
<thead>
<tr>
<th>Reactive Hazard</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stability</td>
<td>Hygroscopic. Oxidizer: Contact with combustible/organic material may cause fire.</td>
</tr>
<tr>
<td>Conditions to Avoid</td>
<td>Avoid dust formation. Incompatible products. Excess heat. Exposure to moist air or water. Combustible material.</td>
</tr>
<tr>
<td>Incompatible Materials</td>
<td>Strong reducing agents, Combustible material</td>
</tr>
<tr>
<td>Hazardous Decomposition Products</td>
<td>Nitrogen oxides (NOx)</td>
</tr>
<tr>
<td>Hazardous Polymerization</td>
<td>No information available.</td>
</tr>
<tr>
<td>Hazardous Reactions</td>
<td>None under normal processing.</td>
</tr>
</tbody>
</table>

### 11. Toxicological information

#### Acute Toxicity

<table>
<thead>
<tr>
<th>Component</th>
<th>LD50 Oral</th>
<th>LD50 Dermal</th>
<th>LC50 Inhalation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manganese nitrate</td>
<td>&gt;300 mg/kg</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
</tbody>
</table>

**Toxicologically Synergistic Products**
No information available

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

**Irritation**
Causes burns by all exposure routes

**Sensitization**
No information available

**Carcinogenicity**
The table below indicates whether each agency has listed any ingredient as a carcinogen.

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>IARC</th>
<th>NTP</th>
<th>ACGIH</th>
<th>OSHA</th>
<th>Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitric acid, manganese(2+) salt, tetrahydrate</td>
<td>20694-39-7</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
<tr>
<td>Manganese nitrate</td>
<td>10377-66-9</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
</tbody>
</table>

**Mutagenic Effects**
No information available

**Reproductive Effects**
No information available.

**Developmental Effects**
No information available.

**Teratogenicity**
No information available.

**STOT - single exposure**
Respiratory system

**STOT - repeated exposure**
Brain

**Aspiration hazard**
No information available
**Symptoms / effects, both acute and delayed**
Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated. Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation.

**Endocrine Disruptor Information**
No information available.

**Other Adverse Effects**
The toxicological properties have not been fully investigated.

### 12. Ecological information

**Ecotoxicity**
Do not empty into drains. Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment. The product contains following substances which are hazardous for the environment.

**Persistence and Degradability**
Soluble in water Persistence is unlikely based on information available.

**Mobility**
Will likely be mobile in the environment due to its water solubility.

### 13. Disposal considerations

**Waste Disposal Methods**
Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

### 14. Transport information

**DOT**
- **UN-No**: UN2724
- **Proper Shipping Name**: MANGANESE NITRATE
- **Hazard Class**: 5.1
- **Packing Group**: III

**TDG**
- **UN-No**: UN2724
- **Proper Shipping Name**: MANGANESE NITRATE
- **Hazard Class**: 5.1
- **Packing Group**: III

**IATA**
- **UN-No**: UN2724
- **Proper Shipping Name**: MANGANESE NITRATE
- **Hazard Class**: 5.1
- **Packing Group**: III

**IMDG/IMO**
- **UN-No**: UN2724
- **Proper Shipping Name**: MANGANESE NITRATE
- **Hazard Class**: 5.1
- **Packing Group**: III

### 15. Regulatory information

All of the components in the product are on the following Inventory lists: X = listed

**International Inventories**

<table>
<thead>
<tr>
<th>Component</th>
<th>TSCA</th>
<th>DSL</th>
<th>NSDL</th>
<th>EINECS</th>
<th>ELINCS</th>
<th>NLP</th>
<th>PICCS</th>
<th>ENCS</th>
<th>AICS</th>
<th>IECSC</th>
<th>KECL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitric acid, manganese(2+) salt, tetrahydrate</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>X</td>
<td>-</td>
<td>-</td>
<td>X</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Manganese nitrate</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>233-828-8</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

**Legend:**
- X - Listed
- E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.
- F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.
N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.
P - Indicates a commenced PMN substance
R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.
S - Indicates a substance that is identified in a proposed or final Significant New Use Rule
T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.
XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B).
Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.
Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

U.S. Federal Regulations

TSCA 12(b)  Not applicable

SARA 313

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>Weight %</th>
<th>SARA 313 - Threshold Values %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitric acid, manganese(2+) salt, tetrahydrate</td>
<td>20694-39-7</td>
<td>100</td>
<td>1.0</td>
</tr>
<tr>
<td>Manganese nitrate</td>
<td>10377-66-9</td>
<td>-</td>
<td>1.0</td>
</tr>
</tbody>
</table>

SARA 311/312 Hazard Categories

<table>
<thead>
<tr>
<th>Hazard Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Health Hazard</td>
<td>Yes</td>
</tr>
<tr>
<td>Chronic Health Hazard</td>
<td>Yes</td>
</tr>
<tr>
<td>Fire Hazard</td>
<td>No</td>
</tr>
<tr>
<td>Sudden Release of Pressure Hazard</td>
<td>No</td>
</tr>
<tr>
<td>Reactive Hazard</td>
<td>Yes</td>
</tr>
</tbody>
</table>

CWA (Clean Water Act)  Not applicable

Clean Air Act

<table>
<thead>
<tr>
<th>Component</th>
<th>HAPS Data</th>
<th>Class 1 Ozone Depletors</th>
<th>Class 2 Ozone Depletors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitric acid, manganese(2+) salt, tetrahydrate</td>
<td>X</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Manganese nitrate</td>
<td>X</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

OSHA  Occupational Safety and Health Administration
Not applicable

CERCLA  Not applicable

California Proposition 65  This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations

<table>
<thead>
<tr>
<th>Component</th>
<th>Massachusetts</th>
<th>New Jersey</th>
<th>Pennsylvania</th>
<th>Illinois</th>
<th>Rhode Island</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitric acid, manganese(2+) salt, tetrahydrate</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>-</td>
</tr>
<tr>
<td>Manganese nitrate</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>-</td>
</tr>
</tbody>
</table>

U.S. Department of Transportation

Reportable Quantity (RQ):  N
DOT Marine Pollutant  N
DOT Severe Marine Pollutant  N

U.S. Department of Homeland Security
This product does not contain any DHS chemicals.
Other International Regulations

Mexico - Grade
No information available

Canada
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR

WHMIS Hazard Class
C  Oxidizing materials
D2A Very toxic materials
D1B Toxic materials
E  Corrosive material

16. Other information

Prepared By
Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Creation Date 23-Sep-2009
Revision Date 16-Feb-2016
Print Date 16-Feb-2016

Revision Summary
This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS)

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 SDS