

# Material Safety Data Sheet

Material Name: Manganese (II) Nitrate Solution

ID: MRD-075

## \*\*\* Section 1 - Chemical Product and Company Identification \*\*\*

**Chemical Name:** Manganese Nitrate Solution

**Product Use:** Various Industrial Applications

**Synonyms:** Manganese Nitrate 50% Solution

### Manufacturer Information

Mineral Research and Development, Inc.  
5910 Pharr Mill Road  
Harrisburg, NC 28075

Phone: 704-454-4811  
Fax: 704-454-7390  
Emergency # CHEMTREC: (800) 424-9300

## \*\*\* Section 2 - Composition / Information on Ingredients \*\*\*

CAS #	Component	Percent
10377-66-9	Manganese nitrate	45-55
7732-18-5	Water	Balance

### Component Related Regulatory Information

This product may be regulated, have exposure limits or other information identified as the following: Manganese (7439-96-5), Manganese compounds, n.o.s., Manganese compounds, inorganic, Manganese inorganic salts, Water Dissociable Nitrate Compounds.

### Component Information/Information on Non-Hazardous Components

This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).

## \*\*\* Section 3 - Hazards Identification \*\*\*

### Emergency Overview

This product is a colorless to slightly pink, odorless solution. This product is an oxidizer in its dry form. This product may cause moderate irritation of the eyes, skin, and other contaminated tissue.

### Potential Health Effects: Eyes

Contact with the eyes can cause moderate irritation. Symptoms may include discomfort or pain and redness. Severe overexposure can result in swelling of the conjunctiva along with tissue damage.

### Potential Health Effects: Skin

This product is moderately irritating to the skin and other contaminated tissue. Depending on the duration of contact, symptoms will include reddening, discomfort, irritation, and possible tissue damage. Prolonged and/or repeated skin contact with this product may cause irritation/dermatitis. Skin absorption is not a significant route of overexposure.

### Potential Health Effects: Ingestion

Ingestion of this product can be harmful or fatal. Immediately upon contact, this product will cause irritation and burns of the mouth, throat, esophagus, and other tissues of the digestive system. Overexposure symptoms include: nausea, abdominal pain, vomiting, and diarrhea. Severe ingestion overexposures can result in convulsions and collapse. The nitrate component of this product may damage the oxygen transport system of the blood. Severe ingestion exposures can be fatal. Repeated ingestion of small amounts of this product may cause weakness, depression, headaches, and mental impairment.

Chronic overexposure to manganese compounds may result in CNS effects such as weakness, sleepiness, emotional instability and spastic gait. These effects can be permanent. Chronic overexposure to manganese can cause "manganism". Manganism is characterized by fatigue, irritability, headaches and asthenia. Symptoms are reversible when exposure stops. When later changes occur, some permanent brain damage can result resembling Parkinson's disease. High or repeated exposures may damage the kidneys or liver.

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## Potential Health Effects: Inhalation

Inhalation of vapors, mists, or sprays of this product may irritate the nose, throat, and lungs. Symptoms may include: sneezing, coughing and difficulty breathing. Severe overexposures can result in damage to respiratory system tissues. Most symptoms are alleviated, when the overexposure ends.

Chronic overexposure to manganese compounds may result in CNS effects such as weakness, sleepiness, emotional instability and spastic gait. These effects can be permanent. Chronic overexposure to manganese can cause "manganism". Manganism is characterized by fatigue, irritability, headaches and asthenia. Symptoms are reversible when exposure stops. When later changes occur, some permanent brain damage can result resembling Parkinson's disease. High or repeated exposures may damage the kidneys or liver.

**HMIS Ratings: Health: 2 Fire: 0 Physical Hazard: 0**

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe \* = Chronic hazard

## \*\*\* Section 4 - First Aid Measures \*\*\*

### First Aid: Eyes

In case of contact, immediately flush eyes with large amounts of water, continuing to flush for 15 minutes. Have contaminated individual "roll" their eyes. Seek immediate medical attention.

### First Aid: Skin

Immediately take off all contaminated clothing. For skin contact, flush with large amounts of water. If irritation persists, get medical attention.

### First Aid: Ingestion

Do not induce vomiting. Call a physician immediately.

### First Aid: Inhalation

Move person to non-contaminated air. Call a physician if symptoms develop or persist.

### First Aid: Notes to Physician

Provide general supportive measures and treat symptomatically.

## \*\*\* Section 5 - Fire Fighting Measures \*\*\*

**Flash Point:** Not Flammable

**Upper Flammable Limit (UFL):** Not Applicable

**Auto Ignition:** Not Available

**Rate of Burning:** Not Applicable

**Method Used:** Not Applicable

**Lower Flammable Limit (LFL):** Not Applicable

**Flammability Classification:** Not Applicable

### General Fire Hazards

This product is an aqueous mixture, which will not burn. If evaporated to dryness, the solid residue may pose a slight fire hazard. This product is an oxidizing agent, which may cause spontaneous ignition of combustible materials.

### Hazardous Combustion Products

Decomposition of this product may produce acrid vapors, manganese compounds, and oxides of nitrogen.

### Extinguishing Media

Use any media suitable for the surrounding fires.

### Fire Fighting Equipment/Instructions

Fire fighters should wear full-face, self-contained breathing apparatus and impervious protective clothing. Fire fighters should avoid inhaling any combustion products.

**NFPA Ratings: Health: 2 Fire: 0 Reactivity: 0**

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

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## \*\*\* Section 6 - Accidental Release Measures \*\*\*

### Containment Procedures

Stop the flow of material, if this is without risk. Wear appropriate protective equipment and clothing during clean up. Contain the discharged material and dike the spilled material where possible. Prevent entry into sewers, drains, underground or confined spaces, water intakes and waterways. Avoid contact with combustible materials.

### Clean-Up Procedures

Absorb spill with inert material. Shovel material into appropriate container for disposal.

### Evacuation Procedures

Isolate area. Keep unnecessary personnel away.

### Special Procedures

Follow all Local, State, Federal and Provincial regulations for disposal.

## \*\*\* Section 7 - Handling and Storage \*\*\*

### Handling Procedures

Do not get this material in your eyes, on your skin, or on your clothing. Avoid breathing vapors or mists of this product. Wash thoroughly after handling. Do not eat, drink or use tobacco products when handling this material. Use this product with adequate ventilation. Launder work clothes frequently. See Section 8 for appropriate protective clothing, equipment and air monitoring procedures.

Open containers slowly, on a stable surface. Containers of this product must be properly labeled. Empty containers may contain residual liquid or vapors. Empty containers should be handled with care.

### Storage Procedures

Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Store away from incompatible materials (see SECTION 10: Stability and Reactivity). Material should be stored in secondary containers, or in a diked area, as appropriate. Keep container tightly closed when not in use. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged.

## \*\*\* Section 8 - Exposure Controls / Personal Protection \*\*\*

### A: Component Exposure Limits

#### Manganese nitrate (10377-66-9)

ACGIH:	0.2 mg/m3 TWA (related to Manganese)
OSHA	1 mg/m3 TWA (fume) (related to Manganese)
Vacated:	5 mg/m3 Ceiling (related to Manganese)
OSHA Final:	5 mg/m3 Ceiling (fume) (related to Manganese)
NIOSH:	1 mg/m3 TWA (fume) (related to Manganese metal)
	3 mg/m3 STEL (related to Manganese metal)

### Engineering Controls

Provide adequate local exhaust ventilation to maintain worker exposure below exposure limits.

### PERSONAL PROTECTIVE EQUIPMENT

#### Personal Protective Equipment: Eyes/Face

Wear safety glasses; chemical goggles (if splashing is possible).

#### Personal Protective Equipment: Skin

Use impervious gloves. Use of an impervious apron is recommended.

#### Personal Protective Equipment: Respiratory

Respiratory protection; not normally required for ambient air concentrations not exceeding the Occupational Exposure Limit. When respiratory protection is required, wear a NIOSH/MSHA approved self-contained breathing apparatus with full-face piece operated in a positive-pressure mode.

#### Personal Protective Equipment: General

Eyewash fountains and emergency showers are required.

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## \*\*\* Section 9 - Physical & Chemical Properties \*\*\*

**Appearance:** Colorless to slightly pink  
**Physical State:** Liquid  
**Vapor Pressure:** Not Applicable  
**Boiling Point:** >100°C (>212°F)  
**Solubility (H<sub>2</sub>O):** Soluble

**Odor:** Odorless  
**pH:** 0-1.5  
**Vapor Density:** Not Applicable  
**Melting Point:** Not Established  
**Specific Gravity:** 1.6 @ 15°C (59°F), water=1

## \*\*\* Section 10 - Chemical Stability & Reactivity Information \*\*\*

### Chemical Stability

Stable under normal conditions.

### Chemical Stability: Conditions to Avoid

Avoid exposure to extreme temperatures, contact with incompatible chemicals, and all contact with combustible materials.

### Incompatibility

Flammable and combustible materials, strong reducing agents, finely powdered metals, strong acids.

### Hazardous Decomposition

Manganese compounds and nitrogen oxides.

### Hazardous Polymerization

Will not occur.

## \*\*\* Section 11 - Toxicological Information \*\*\*

### Acute and Chronic Toxicity

#### A: General Product Information

This product is moderately irritating to contaminated tissue.

#### B: Component Analysis - LD50/LC50

##### Manganese nitrate (10377-66-9)

Oral LD50 Rat: 9 g/kg (related to Manganese)

500 mg/m3 IDLH (related to Manganese)

### Carcinogenicity

#### A: General Product Information

No carcinogenicity data available for this product.

#### B: Component Carcinogenicity

None of this product's components are listed by ACGIH, IARC, OSHA, NIOSH, or NTP.

### Other Toxicological Information

Target Organs: Skin, eyes, nervous system, brain, liver, kidneys

## \*\*\* Section 12 - Ecological Information \*\*\*

### Ecotoxicity

#### A: General Product Information

In high concentrations, this product may be dangerous to aquatic life and fouling to shorelines.

#### B: Component Analysis - Ecotoxicity - Aquatic Toxicity

No ecotoxicity data are available for this product's components.

### Environmental Fate

No information available for the product.

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## \*\*\* Section 13 - Disposal Considerations \*\*\*

### US EPA Waste Number & Descriptions

#### A: General Product Information

Wastes must be tested using methods described in 40 CFR Part 261 to determine if it meets applicable definitions of hazardous wastes. As packaged this product is a D001 ignitable and D002 corrosive waste per 40 CFR 261; applicable to wastes consisting only of this product.

#### B: Component Waste Numbers

No EPA Waste Numbers are applicable for this product's components.

#### Disposal Instructions

Dispose of waste material according to Local, State, Federal, and Provincial Environmental Regulations.

## \*\*\* Section 14 - Transportation Information \*\*\*

### US DOT Information

**Shipping Name:** Corrosive Liquid, Oxidizing n.o.s (Manganese Nitrate)

**Hazard Class:** 8 (5.1)

**UN/NA #:** UN 3093

**Packing Group:** II

**Required Label(s):** Corrosive, Oxidizer

### Canada Transportation of Dangerous Goods Information

**Shipping Name:** Corrosive Liquid, Oxidizing n.o.s (Manganese Nitrate)

**Hazard Class:** 8 (5.1)

**UN/NA #:** UN 3093

**Packing Group:** II

**Required Label(s):** Corrosive, Oxidizer

## \*\*\* Section 15 - Regulatory Information \*\*\*

### US Federal Regulations

#### A: General Product Information

All components are on the U.S. EPA TSCA Inventory List.

#### B: Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

##### Manganese nitrate (10377-66-9)

SARA 313: 1.0 % de minimis concentration (related to Manganese)

1.0 % de minimis concentration (Chemical Category N511) (related to Water Dissociable Nitrate Compounds)

#### C: Federal Insecticide, Fungicide, and Rodenticide Act

No information is available.

**SARA 311/312:** Acute Health Yes Chronic Health Yes Fire No Pressure No Reactive Yes

### State Regulations

#### A: General Product Information

Other state regulations may apply. Check individual state requirements.

#### B: Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA	RI
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Manganese nitrate (related to Manganese)	10377-66-9	Yes <sup>1</sup>	Yes <sup>1</sup>	Yes <sup>1</sup>	Yes	Yes <sup>1</sup>	Yes <sup>1</sup>
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## Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Manganese nitrate	10377-66-9	1 % (English Item 974, French Item 1077) (related to Manganese, elemental)

## Additional Regulatory Information

### A: General Product Information

No additional information available.

### B: Component Analysis - Inventory

Component	CAS #	TSCA	DSL	NDSL	EINECS	AUST	MITI	PHIL	KOREA	ELINCS	CHINA
Manganese nitrate	10377-66-9	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes
Water	7732-18-5	Yes	Yes	No	Yes	Yes	Yes	No	Yes	No	Yes

## \*\*\* Section 16 - Other Information \*\*\*

### Other Information

Disclaimer: Supplier gives no warranty of merchantability or of fitness for a particular purpose. Any product purchased is sold on the assumption the purchaser will make his own tests to determine the quality and suitability of the product. Supplier expressly disclaims any and all liability for incidental and/or consequential property damage arising out of the use of this product. No information provided shall be deemed to be a recommendation to use any product in conflict with any existing patent rights. Read the Material Safety Data Sheet before handling product.

### Key/Legend

ACGIH = American Conference of Governmental Industrial Hygienists. AICS = Australian Inventory of Chemical Substances. CAS = Chemical Abstract Service. CERCLA = Comprehensive Environmental Response, Compensation and Liability Act. CFR = Code of Federal Regulations. CHEMTREC = Chemical Transportation Emergency Center. DSL = Canadian Domestic Substance List. EINECS = European Inventory of New and Existing Chemical Substances. ELINCS = European List of Notified Chemical Substances. EPA = Environmental Protection Agency. FIFRA = Federal Insecticide, Fungicide, and Rodenticide Act; HEPA = High Efficiency Particulate Air. HMIS = Hazardous Material Information System. IARC = International Agency for Research on Cancer. IDLH = Immediately Dangerous to Life and Health. MITI = Japanese Ministry of International Trade and Industry. NDSL = Canadian Non-Domestic Substance List. NFPA = National Fire Protection Association. NIOSH = National Institute of Occupational Safety and Health. NJTSR = New Jersey Trade Secret Registry. NTP = National Toxicology Program. OSHA = Occupational Safety and Health Administration. NA = Not available or Not Applicable. SARA = Superfund Amendments and Reauthorization Act. TDG = Transportation of Dangerous Goods. TLV = Threshold Limit Value. TSCA = Toxic Substances Control Act. WHMIS = Workplace Hazardous Materials Information System.

This is the end of MSDS # MRD-075