



## Safety Data Sheet

### 1. Identification

**Product identifier** MAN 5  
**Other means of identification** Chelated Manganese Sulfate Solution.  
**Recommended restrictions** None known.  
**Recommended use** Agriculture / Horticulture

### **Manufacturer / Importer / Supplier / Distributor Information**

**Company name** CHS Inc  
**Address** 5500 Cenex Drive  
Inver Grove Heights, MN 55077 US  
**Telephone** 1-651-355-6000  
**Website** www.chsinc.com  
**Contact person** EH&S/Regulatory Department  
**Emergency phone number** CHEMTREC (24 hours): 1-800-424-9300

### 2. Hazard(s) identification

**Physical hazards** Not classified.

**Health hazards** Not classified.

**OSHA defined hazards** Not classified.

#### Label elements

**Hazard symbol**



**Signal word**

Warning.

**Hazard statement**

Eye and skin irritant. May be harmful if ingested.

**Precautionary statement**

**Prevention**

Observe good industrial hygiene practices.

**Response**

Wash hands after handling.

**Storage**

Store away from incompatible material.

**Disposal**

Dispose of waste and residues in accordance with local authority requirements.

**Hazard(s) not otherwise classified (HNOC)**

Not classified.

**Supplemental information**

Not applicable.

### 3. Composition/information on ingredients

#### Mixtures

Chemical name	CAS number	%
Water	7732-18-5	50 – 60
Organic Acids	77-92-9	15 – 20
Manganese Sulfate Monohydrate	10034-96-5	10 – 20
Ammonia hydroxide	1336-21-6	5 – 10

**Composition comments**

All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.



## Safety Data Sheet

The Safety Data Sheet is not a guarantee of product specification or NPK value(s). NPK content is on specified sales orders, customer invoices, or product specification sheets obtained from supplier.

### 4. First-aid measures

<b>Eye contact</b>	Check for and remove contact lenses. Flush immediately with copious amounts of water or normal saline (minimum of 15 minutes), holding eyelids apart to ensure complete irrigation of the eye and eyelid tissue. Take exposed individual to a health care professional, preferably an ophthalmologist, for further evaluation.
<b>Skin contact</b>	Remove contaminated clothing, shoes and equipment. Wash exposed area with plenty of soap and water. Repeat washing. If redness or irritation occurs, seek medical attention. Wash contaminated clothing before reuse.
<b>Inhalation</b>	No adverse effects anticipated. If necessary, remove victim to fresh air and loosen clothing. Get medical attention.
<b>Ingestion</b>	Rinse mouth thoroughly. Drink 1 or 2 glasses of water. Do not induce vomiting without advice from poison control center. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Get medical attention.
<b>Most important symptoms/effects, acute and delayed</b>	Direct contact with eyes may cause temporary irritation.
<b>Indication of immediate medical attention and special treatment needed</b>	Treat symptomatically.
<b>General information</b>	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

### 5. Fire-fighting measures

<b>Suitable extinguishing media</b>	Water fog. Water spray. Carbon dioxide (CO <sub>2</sub> ). Foam.
<b>Unsuitable extinguishing media</b>	Do not use water jet as an extinguisher, as this will spread the fire.
<b>Specific hazards arising from the chemical</b>	The product is not flammable. During fire, gases hazardous to health may be formed.
<b>Special protective equipment and precautions for firefighters</b>	Self-contained breathing apparatus and full protective clothing should be worn when fighting chemical fires. Selection of respiratory protection for firefighting follow the general fire precautions indicated in the workplace.
<b>Fire-fighting equipment/instructions</b>	Use standard firefighting procedures and consider the hazards of other involved materials. Move containers from the fire area if you can do so without risk. In the event of fire, cool tanks with water spray.

### 6. Accidental release measures

<b>Personal precautions, protective equipment and emergency procedures</b>	Avoid inhalation of vapors and spray mist and contact with skin and eyes. Wear suitable protective clothing. For personal protection see Section 8 of the SDS.
<b>Methods and materials for containment and cleaning up</b>	Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Absorb with vermiculite, dry sand or earth and place into containers. After removal flush contaminated area thoroughly with water.



## Safety Data Sheet

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use.

### Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not contaminate water. Do not allow to enter drains, sewers or watercourses.

### 7. Handling and storage

#### Precautions for safe handling

Avoid inhalation of vapors/spray and contact with skin and eyes. Use only with adequate ventilation. Observe good industrial hygiene practices.

#### Conditions for safe storage, including any incompatibilities

Keep container tightly closed. Store in a cool, dry well-ventilated place. Store away from incompatible materials.

### 8. Exposure controls/personal protection

#### Occupational exposure limits

##### US OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value
Ammonia (CAS 7664-41-7)	PEL	35 mg/m <sup>3</sup> 50 ppm

##### US ACGIH Threshold Limit Values

Components	Type	Value
Ammonia (CAS 7664-41-7)	STEL TWA	35 ppm 25 ppm

##### US NIOSH Pocket Guide to Chemical Hazards: Recommended exposure limit (REL)

Components	Type	Value
Ammonia (CAS 7664-41-7)	TWA	18 mg/m <sup>3</sup> 25 ppm

##### US NIOSH Pocket Guide to Chemical Hazards: Short Term Exposure Limit (STEL)

Composition	Type	Value
Ammonia (CAS 7664-41-7)	STEL	27 mg/m <sup>3</sup> 35 ppm

#### Biological limit values

No biological exposure limits noted for the ingredient(s).

#### Exposure guidelines

Follow standard monitoring procedures.

#### Appropriate engineering controls

Provide adequate general and local exhaust ventilation. Observe Occupational Exposure Limits and minimize the risk of inhalation of vapors and mists.

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

##### Eye/face protection

Wear approved safety glasses or goggles.

##### Skin Protection

##### Hand protection

Chemical resistant gloves are recommended. Be aware that the liquid may penetrate the gloves. Frequent change is advisable. Suitable gloves can be recommended by the glove supplier.

##### Other

Wear appropriate clothing to prevent repeated or prolonged skin contact.

##### Respiratory protection

If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. Wear air supplied respiratory protection if exposure concentrations are unknown. In case of inadequate ventilation or risk of inhalation of vapors, use suitable respiratory equipment.

In the United States of America, if respirators are used, a program should be instituted to assure compliance with OSHA 29 CFR 1910.134 and ANSI Z88.2.



## Safety Data Sheet

### Thermal hazards

Wear appropriate thermal protective clothing, when necessary.

### General hygiene consideration

Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Handle in accordance with good industrial hygiene and safety practice.

## 9. Physical and chemical properties

<b>Appearance</b>	Dark Red liquid.
<b>Physical State</b>	Liquid.
<b>Form</b>	Red Liquid.
<b>Color</b>	Red.
<b>Odor</b>	Ammonia odor.
<b>Odor threshold</b>	Not available.
<b>pH</b>	8.5 – 9.5
<b>Melting point/freezing point</b>	Not available.
<b>Initial boiling point and boiling range</b>	Not available.
<b>Flash point</b>	Not flammable.
<b>Evaporation Rate</b>	Not available.
<b>Flammability (solid, gas)</b>	Not available.
<b>Vapor pressure</b>	Not available.
<b>Vapor Density (Air=1)</b>	Not available.
<b>Relative density</b>	1.25 g/ml
<b>Solubility (water)</b>	Not available.
<b>Partition coefficient (n-octanol/water)</b>	Not available.
<b>Auto-ignition temperature</b>	Not available.
<b>Viscosity</b>	Not available.
<b>Other information</b>	Not available. NA

## 10. Stability and reactivity

<b>Reactivity</b>	The product is stable and non-reactive under normal conditions of use, storage and transport.
<b>Chemical stability</b>	Stable under normal temperature conditions.
<b>Possibility of hazardous reactions</b>	Hazardous polymerization does not occur.
<b>Conditions to avoid</b>	Heat. Extreme temperatures. Contact with incompatible materials.
<b>Incompatible materials</b>	Strong acids. Reactive metals and oxidizing agents.
<b>Hazardous decomposition products</b>	Ammonia. Oxides of nitrogen, manganese, sulfur and carbon.

## 11. Toxicological information

### Information on likely routes of exposure

<b>Ingestion</b>	May cause discomfort if swallowed.
<b>Inhalation</b>	In high concentrations, vapors may be irritating to the respiratory system.
<b>Skin contact</b>	Prolonged or repeated skin contact may cause irritation.
<b>Eye contact</b>	May cause eye irritation on direct contact.

### Symptoms related to the physical, chemical and toxicological characteristics

Direct contact with eyes may cause temporary irritation.



## Safety Data Sheet

### Information on toxicological effects

**Acute toxicity** May cause discomfort if swallowed.

<b>Components</b>	<b>Species</b>	<b>Test Results</b>
Ammonium hydroxide (CAS 1336-21-6) <b>Acute</b> <i>Oral</i> LD50	Rat	350 mg/kg

**Skin corrosion/irritation** Prolonged exposure may cause skin irritation.

**Serious eye damage/eye irritation** May cause eye irritation on direct contact.

**Respiratory sensitization** Based on available data, the classification criteria are not met.

**Skin sensitization** Not classified as a sensitizer.

**Germ cell mutagenicity** Based on available data, the classification criteria are not met.

**Carcinogenicity** This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

**Reproductive toxicity** Based on available data, the classification criteria are not met.

**Specific target organ toxicity-single exposure** In high concentrations, vapors may be irritating to the respiratory system.

**Specific target organ toxicity-repeated exposure** Based on available data, the classification criteria are not met.

**Aspiration hazard** Based on available data, the classification criteria are not met.

**Chronic effects** Prolonged exposure may cause chronic effects.

**Further information** No other specific acute or chronic health impact noted.

### 12. Ecological information

**Ecotoxicity** May release ammonium ions that are toxic to fish. Un-ionized ammonia concentrations above 0.02 mg/l are considered toxic in fresh water.

<b>Components</b>	<b>Species</b>	<b>Test Results</b>
Ammonium hydroxide (CAS 1336-21-6) <b>Aquatic</b> Fish LC50	Western mosquitofish ( <i>Gambusia affinis</i> )	15 mg/l, 96 hours

**Persistence and degradability** No data available.

**Bioaccumulative potential** No data available for this product.

**Mobility in soil** This product is water soluble and may disperse in soil.

**Other adverse effects** No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

### 13. Disposal considerations

**Disposal instructions** Do not allow this material to drain into sewers/water supplies. Dispose in accordance with all applicable regulations.



## Safety Data Sheet

<b>Hazardous waste code</b>	The waste code should be assigned in discussion between the user, the producer and the waste disposal company.
<b>Waste from residues / unused products</b>	Disposal recommendations are based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.
<b>Contaminated packaging</b>	Since emptied containers may retain product residue, follow label warnings even after container is emptied.

### 14. Transport information

<b>DOT</b>	Not regulated as a hazardous material by DOT.
<b>IATA</b>	Not regulated as a dangerous good.
<b>IMDG</b>	Not regulated as a dangerous good.
<b>Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code</b>	Not applicable.

### 15. Regulatory information

<b>US federal regulations</b>	All components of this product are on the U.S. EPA TSCA Inventory List or are exempt from TSCA inventory requirements. This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
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#### **TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)**

Not regulated.

#### **US OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)**

Not listed.

#### **CERCLA Hazardous Substance List (40 CFR 302.4)**

Ammonium hydroxide (CAS 1336-21-6) LISTED

#### **Superfund Amendments and Reauthorization Act of 1986 (SARA)**

<b>Hazard categories</b>	Immediate Hazard - Yes Delayed Hazard - No Fire Hazard - No Pressure Hazard - No Reactivity Hazard - No
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<b>SARA 302 Extremely hazardous substance</b>	No
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<b>SARA 311/312 Hazardous chemical</b>	Yes
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#### **SARA 313 (TRI reporting)**

<u>Chemical name</u>	<u>CAS number</u>	<u>% by wt.</u>
Ammonia	7664-41-7	5 - 10
Manganese compounds	7439-96-5	5

#### **Other federal regulations**

##### **Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List**

Not regulated.

##### **Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)**

Not regulated.

<b>Safe Drinking Water Act (SDWA)</b>	Not regulated.
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<b>Food and Drug Administration (FDA)</b>	Not regulated.
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## Safety Data Sheet

### US state regulations

This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

#### US Massachusetts RTK – Substance List

Ammonium hydroxide (CAS 1336-21-6)

#### US New Jersey Worker and Community Right-to-Know Act

Ammonium hydroxide (CAS 1336-21-6)

#### US Pennsylvania RTK – Hazardous Substances

Ammonium hydroxide (CAS 1336-21-6)

#### US Rhode Island RTK

Ammonium hydroxide (CAS 1336-21-6)

#### US California Proposition 65

US – California Proposition 65 – Carcinogens & Reproductive Toxicity (CRT): Listed substances

Not listed.

### International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

\*A “Yes” indicates this product complies with the inventory requirements administered by the governing country(s).

A “No” indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

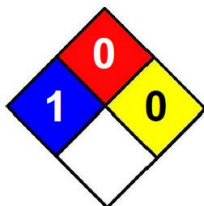
### 16. Other information, including date of preparation or last revision

**Issue date** 22-December-2016

**Revision date** NA

**Version #** 1.0 SDS

#### NFPA Ratings



#### References

EPA: Acquire database  
HSDB® – Hazardous Substances Data Bank  
IARC Monographs. Overall Evaluation of Carcinogenicity  
National Toxicology Program (NTP) Report on Carcinogens  
ACGIH Documentation of the Threshold Limit Value and Biological Exposure Indices

#### Preparation

The preparation of this MSDS was in accordance with ANSI Z400.1-2010.

#### Disclaimer

NOTICE: The information presented herein is based on data considered to be accurate as of the date of preparation of this Safety Data Sheet (SDS) and was prepared pursuant to Government regulation(s) that identify specific types of information to be provided. This SDS may not be used as a commercial specification sheet of manufacturer or seller, and no warranty or representation, expressed or implied, is made as to the accuracy or comprehensiveness of the foregoing data and safety information, nor is any authorization given or implied to practice any patented invention without a license. Additional information may be needed to evaluate other uses of the product, including use of the product in combination with any materials or in any processes other than those specifically referenced. Information provided herein with respect to any hazards that may be associated with the product is not meant to suggest that use of the product in a given application will necessarily result in any exposure or risk to workers or the general public. No responsibility can be assumed by vendor for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practices, or from any hazards inherent in the nature of the product. Purchasers and users assume all risk of use, storage and handling of the product in compliance with applicable federal, state and local laws and regulations. Purchasers and users of the product specifically should advise all of their employees, agents, contractors and customers who will use the product of this (M)SDS.