SECTION 1. IDENTIFICATION

Product Identifier: (4N) 99.99% Manganese Nitrate Solution

Product Code: MN-NAT-04-SOL

CAS Number: 10377-66-9

Relevant identified uses of the substance: Scientific research and development

Supplier details:
American Elements
10884 Weyburn Ave.
Los Angeles, CA 90024
Tel: +1 310-208-0551
Fax: +1 310-208-0351
Emergency telephone number:
+1 800-424-9300

SECTION 2. HAZARDS IDENTIFICATION

Classification of the substance or mixture in accordance with 29 CFR 1910 (OSHA HCS)

GHS03 Flame over circle
Ox. Liq. 2 H272 May intensify fire; oxidizer.
GHS08 Health hazard
STOT RE 2 H373 May cause damage to the brain through prolonged or repeated exposure. Route of exposure: Inhalative.
GHS05 Corrosion
Skin Corr. 1C H314 Causes severe skin burns and eye damage.
GHS07
Acute Tox. 4 H302 Harmful if swallowed.
Hazards not otherwise classified No data available.
GHS label elements The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS)
Hazard pictograms
GHS03 GHS05 GHS07 GHS08
Signal word Danger
Hazard-determining components of labeling:
Manganese(II) nitrate
Hazard statements
H272 May intensify fire; oxidizer.
H302 Harmful if swallowed.
H314 Causes severe skin burns and eye damage.
H373 May cause damage to the brain through prolonged or repeated exposure. Route of exposure: Inhalative.
Precautionary statements
P221 Take any precaution to avoid mixing with combustibles.
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P405 Store locked up.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.
WHMIS classification
D1B - Toxic material causing immediate and serious toxic effects
D2A - Very toxic material causing other toxic effects
E - Corrosive material
Classification system
HMIS ratings (scale 0-4)
(Hazardous Materials Identification System)
HEALTH
FIRE
REACTIVITY
3
0
2
Health (acute effects) = 3
Flammability = 0
Physical Hazard = 2
Other hazards
Results of PBT and vPvB assessment:
PBT: N/A.
vPvB: N/A.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical characterization: Mixtures
Dangerous components:
10377-66-9 Manganese(II) nitrate
Ox. Sol. 2, H272; STOT RE 2, H373; Skin Corr. 1C, H314; Eye Dam. 1, H318; Acute Tox. 4, H302 50.0%
Additional information None known.
SECTION 4. FIRST AID MEASURES

Description of first aid measures
General information Immediately remove any clothing soiled by the product.
If inhaled: Supply fresh air. If not breathing, provide artificial respiration. Keep patient warm. Seek immediate medical advice.
In case of skin contact: Immediately wash with soap and water; rinse thoroughly. Seek immediate medical advice.
In case of eye contact: Rinse opened eye for several minutes under running water. Consult a physician.
If swallowed: Seek medical treatment.
Information for doctor Most important symptoms and effects, both acute and delayed Causes severe skin burns. Causes serious eye damage. Indication of any immediate medical attention and special treatment needed No information available.

SECTION 5. FIREFIGHTING MEASURES

Extinguishing media Suitable extinguishing media Product is not flammable. Use fire-fighting measures that suit the surrounding fire.
For safety reasons unsuitable extinguishing media Halocarbon extinguisher Special hazards arising from the substance or mixture This substance is an oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition.
If this product is involved in a fire, the following can be released: Nitrogen oxides (NOx) Metal oxide fume Advice for firefighters Protective equipment: Wear self-contained respirator. Wear fully protective impervious suit.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures Wear protective equipment. Keep unprotected persons away. Ensure adequate ventilation Environmental precautions: Do not allow product to reach sewage system or any water course. Methods and material for containment and cleanup: Use neutralizing agent. Dispose of contaminated material as waste according to section 13. Ensure adequate ventilation. Absorb with liquid-binding material.
Prevention of secondary hazards:
Acts as an oxidizing agent on organic materials such as wood, paper and fats
Keep away from combustible material.
Reference to other sections
See Section 7 for information on safe handling
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

SECTION 7. HANDLING AND STORAGE

Handling
Precautions for safe handling
Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.
Ensure adequate ventilation.
Information about protection against explosions and fires:
Substance/product can reduce the ignition temperature of flammable substances.
This substance is an oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition.
Conditions for safe storage, including any incompatibilities
Storage
Requirements to be met by storerooms and receptacles: No special requirements.
Information about storage in one common storage facility:
Store away from flammable substances.
Store away from reducing agents.
Do not store with organic materials.
Store away from metal powders.
Store away from strong bases.
Water reacts with many metals to give hydrogen, often violently. Water is also incompatible with many reactive organic and inorganic chemicals.
Further information about storage conditions:
Keep container tightly sealed.
Store in cool, dry conditions in well-sealed containers.
Specific end use(s) No information available.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.
Control parameters
Components with limit values that require monitoring at the workplace:
10377-66-9 Manganese(II) nitrate (50.0%)
PEL (USA) Ceiling limit value: 5 mg/m³ as Mn
REL (USA) Short-term value: 3 mg/m³
Long-term value: 1 mg/m³ as Mn
TLV (USA) Long-term value: 0.02* 0.1* mg/m³ as Mn; *respirable **inhalable fraction
EL (Canada) Long-term value: 0.2 mg/m³
as Mn; R

Additional information: No data

Exposure controls

Personal protective equipment

Follow typical general protective and industrial hygiene measures for handling chemicals.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Do not inhale dust / smoke / mist.
Avoid contact with the eyes and skin.
Breathing equipment: Use suitable respirator when high concentrations are present.
Recommended filter device for short term use:
Use a respirator with acid gas cartridges as a backup to engineering controls. Risk assessment should be performed to determine if air-purifying respirators are appropriate. Only use equipment tested and approved under appropriate government standards such as NIOSH (USA) or CEN (EU).

Protection of hands:

Impervious gloves
Inspect gloves prior to use.
The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.
Penetration time of glove material (in minutes) No data available.

Eye protection:

Tightly sealed goggles
Full face protection

Body protection: Protective work clothing.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance:

Form: Liquid
Color: Pink
Odor: Amine-like
Odor threshold: No data available.

pH-value at 20 °C (68 °F): 1 (approx)
Melting point/range: No data available.

Boiling point/range: No data available.

Sublimation temperature / start: No data available.
Flammability (solid, gas): No data available.
Ignition temperature: No data available.
Decomposition temperature: No data available.
Auto igniting: Product is not selfigniting.
Danger of explosion: No data available.

Explosion limits:

Lower: No data available.
Upper: No data available.

Vapor pressure at 20 °C (68 °F): 23 hPa (17 mm Hg)
Density at 20 °C (68 °F): 1.54 g/cm³ (12.851 lbs/gal)
Relative density No data available.
Vapor density No data available.
Evaporation rate No data available.

Solubility in / Miscibility with
Water: Fully miscible
Partition coefficient (n-octanol/water): No data available.
Viscosity:
Dynamic: No data available.
Kinematic: No data available.
Solvent content:
Organic solvents: 0.0 %
Solids content: 50.0 %
Other information No information available.

SECTION 10. STABILITY AND REACTIVITY

Reactivity May intensify fire; oxidizer.
Chemical stability Stable under recommended storage conditions.
Thermal decomposition / conditions to be avoided: Decomposition will not occur if used and stored
according to specifications.
Possibility of hazardous reactions
Water reacts violently with alkali metals.
Water reacts with many metals to give hydrogen, often violently. Water is also incompatible with many
reactive organic and inorganic chemicals.
Reacts with reducing agents
Reacts with flammable substances
Conditions to avoid No information available.
Incompatible materials:
Flammable substances
Reducing agents
Bases
Organic materials
Metal powders
Hazardous decomposition products:
Nitrogen oxides
Metal oxide fume

SECTION 11. TOXICOLOGICAL INFORMATION

Information on toxicological effects
Acute toxicity:
Harmful if swallowed.
Swallowing will lead to a strong corrosive effect on mouth and throat and to the danger of perforation
of esophagus and stomach.
The Registry of Toxic Effects of Chemical Substances (RTECS) contains acute toxicity data for
components in this product.
LD/LC50 values that are relevant for classification: No data
Skin irritation or corrosion: Causes severe skin burns.
Eye irritation or corrosion: Causes serious eye damage.
Sensitization: No sensitizing effects known.
Germ cell mutagenicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains
mutation data for components in this product.
Carcinogenicity:
EPA-D: Not classifiable as to human carcinogenicity: inadequate human and animal evidence of
carcinogenicity or no data are available.
ACGIH A4: Not classifiable as a human carcinogen: Inadequate data on which to classify the agent in terms of its carcinogenicity in humans and/or animals.

Reproductive toxicity: N/A

Specific target organ system toxicity - repeated exposure:
May cause damage to the brain through prolonged or repeated exposure. Route of exposure: Inhalative.

Specific target organ system toxicity - single exposure: N/A

Aspiration hazard: N/A

Subacute to chronic toxicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains multiple dose toxicity data for this substance.

Additional toxicological information:
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known. The product shows the following dangers according to internally approved calculation methods for preparations:
Harmful
Corrosive

SECTION 12. ECOLOGICAL INFORMATION

Toxicity
Aquatic toxicity: No information available.
Persistence and degradability: No information available.
Bioaccumulative potential: No information available.
Mobility in soil: No information available.
Ecotoxical effects:
Remark: Harmful to aquatic organisms
Additional ecological information:
General notes:
Do not allow undiluted product or large quantities to reach ground water, water course or sewage system.
May cause long lasting harmful effects to aquatic life.
Avoid transfer into the environment.
Harmful to aquatic organisms
Results of PBT and vPvB assessment:
PBT: N/A.
vPvB: N/A.
Other adverse effects No information available.

SECTION 13. DISPOSAL CONSIDERATIONS

Waste treatment methods
Recommendation: Consult state, local or national regulations to ensure proper disposal.
Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.
Recommended cleansing agent: Water, if necessary with cleansing agents.

SECTION 14. TRANSPORT INFORMATION

UN-Number
DOT, IMDG, IATA UN3093
UN proper shipping name
DOT Corrosive liquids, oxidizing, n.o.s. (Manganese nitrate)
IMDG, IATA CORROSIVE LIQUID, OXIDIZING, N.O.S. (MANGANESE NITRATE)
Transport hazard class(es)
DOT
Class 8 Corrosive substances.
Label 8+6.1
Class 8 (CO1) Corrosive substances
Label 8+6.1
IMDG, IATA
Class 8 Corrosive substances.
Label 8+6.1
Packing group
DOT, IMDG, IATA II
Environmental hazards:
Marine pollutant (IMDG): No
Special precautions for user Warning: Corrosive substances
EMS Number: F-A,S-Q
Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code N/A.
Transport/Additional information:
DOT
Marine Pollutant (DOT): No
UN "Model Regulation": UN3093, Corrosive liquids, oxidizing, n.o.s. (Manganese nitrate), 8 (6.1), II

SECTION 15. REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture
GHS label elements The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS)
Hazard pictograms
GHS03 GHS05 GHS07 GHS08
Signal word Danger
Hazard-determining components of labeling:
Manganese(II) nitrate
Hazard statements
H272 May intensify fire; oxidizer.
H302 Harmful if swallowed.
H314 Causes severe skin burns and eye damage.
H373 May cause damage to the brain through prolonged or repeated exposure. Route of exposure: Inhalative.
Precautionary statements
P221 Take any precaution to avoid mixing with combustibles.
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P405 Store locked up.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.
National regulations
All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.
All components of this product are listed on the Canadian Domestic Substances List (DSL).
SARA Section 313 (specific toxic chemical listings)
10377-66-9 Manganese(II) nitrate 50.0%
California Proposition 65
Prop 65 - Chemicals known to cause cancer
None of the ingredients are listed.
Prop 65 - Developmental toxicity
None of the ingredients are listed.
Prop 65 - Developmental toxicity, female
None of the ingredients are listed.
Prop 65 - Developmental toxicity, male
None of the ingredients are listed.
Information about limitation of use: For use only by technically qualified individuals.
Other regulations, limitations and prohibitive regulations
Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No. 1907/2006.
None of the ingredients are listed.
The conditions of restrictions according to Article 67 and Annex XVII of the Regulation (EC) No
1907/2006 (REACH) for the manufacturing, placing on the
market and use must be observed.
None of the ingredients is listed.
Annex XIV of the REACH Regulations (requiring Authorisation for use)
None of the ingredients is listed.
Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16. OTHER INFORMATION

Safety Data Sheet according to Regulation (EC) No. 1907/2006 (REACH). The above information is
believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The
information in this document is based on the present state of our knowledge and is applicable to the
product with regard to appropriate safety precautions. It does not represent any guarantee of the
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