1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers
Product name: Sodium permanganate
Description: 40% minimum as NaMnO4

1.2 Relevant identified uses of the substance or mixture and uses advised against
Identified uses: Oxidation of organic compounds for remediation

1.3 Details of the supplier of the safety data sheet
Company: Hepure Technologies, Inc.
63 Main Street, Suite 203B
Flemington, NJ 08822
Phone: 877-727-4776

1.4 Emergency telephone number
Emergency Phone #: CHEMTREC 1-800-424-9300

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture
GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Oxidizing liquids (Category 2), H272
Acute toxicity, Oral (Category 4), H302
Skin corrosion (Category 1B), H314
Serious eye damage (Category 1 ), H318
Specific target organ toxicity, single exposure (Category 3, Respiratory Tract irritation)
Acute aquatic toxicity (Category 1 ), H400
Chronic aquatic toxicity (Category 1 ), H410
For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements
Pictogram
Signal word: Danger

Hazard statement(s)
H272 May intensify fire; oxidizer.
H302 Harmful if swallowed.
H314 Causes severe skin burns and eye damage.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)
P210 Keep away from heat.
P220 Keep/store away from clothing/combustible materials.
P221 Take any precaution to avoid mixing with combustibles.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P273 Avoid release to the environment.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P301 + P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353 IF ON SKIN (or hair): Remove/Take off immediately all Contaminated clothing. Rinse skin with water/shower.
P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a Position comfortable for breathing.
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/physician.
P321 Specific treatment (see supplemental first aid instructions on this label).
P363 Wash contaminated clothing before reuse.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
P391 Collect spillage.
P405 Store locked up.
P501 Dispose of contents/container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS – none
3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures

Formula: MnNaO₄
Molecular weight: 141.93 g/mol

Hazardous components:

<table>
<thead>
<tr>
<th>Component</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium Permanganate</td>
<td>Ox. Sol. 2; Acute Tox. 4; Skin Corr. 1B; Eye Dam. 1; Aquatic Acute 1; Aquatic Chronic 1; H272, H302, H314, H410</td>
<td>&gt;=36-40%</td>
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<tr>
<td>CAS-No. 10101-50-5</td>
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<td></td>
</tr>
<tr>
<td>EC-No. 233-251-1</td>
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<td></td>
</tr>
</tbody>
</table>

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

**General advice**
Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

**If inhaled**
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

**In case of skin contact**
Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Consult a physician.

**In case of eye contact**
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. Continue rinsing eyes during transport to hospital.

**If swallowed**
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

*Physicians Note*
Decomposition products are alkaline

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labeling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
5. FIREFIGHTING MEASURES

5.1 Extinguishing media
Use large amounts of water. Dike to contain.
DO NOT USE dry chemicals, foams

5.2 Special hazards arising from the substance or mixture
Sodium oxides, Manganese/manganese oxides

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting.

5.4 Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Contain spill by collecting the liquid in a pit or holding behind a dam. Dilute to approx. 6% solution with water and then reduce with sodium thiosulfate, a bisulfite, or ferrous salt solution. Flush with abundant water into the sewer if permitted by federal, state, and local authorities. If not, collect and treat as above.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapor or mist. Keep away from sources of ignition - No smoking. Keep away from heat and sources of ignition. For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Segregate from acids, peroxides, formaldehyde, and all combustible, organic, or easily oxidized materials.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
Components with workplace control parameters

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Basis</th>
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</thead>
<tbody>
<tr>
<td>Sodium permanganate</td>
<td>10101-50-5</td>
<td>C</td>
<td>5.000000 mg/m³</td>
<td>USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants</td>
</tr>
<tr>
<td>Remarks</td>
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<td></td>
<td>Ceiling limit is to be determined from breathing-zone air samples.</td>
<td></td>
</tr>
<tr>
<td>TWA</td>
<td></td>
<td>0.200000 mg/m³</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
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<tr>
<td>Central Nervous System impairment</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adopted values or notations enclosed are those for which changes are proposed in the NIC</td>
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<tr>
<td>See Notice of Intended Changes (NIC) varies</td>
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<tr>
<td>TWA</td>
<td></td>
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<td>USA. NIOSH Recommended Exposure Limits</td>
<td></td>
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<tr>
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<td></td>
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<td>USA. ACGIH Threshold Limit Values (TLV)</td>
<td></td>
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<tr>
<td>Central Nervous System impairment</td>
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<td></td>
<td>2014 Adoption</td>
<td></td>
</tr>
</tbody>
</table>

2014 Adoption
<table>
<thead>
<tr>
<th>Exposure controls</th>
</tr>
</thead>
</table>

**Appropriate engineering controls**
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

**Personal protective equipment**

**Eye/face protection**
Tightly fitting safety goggles. Faceshield (8-inch minimum). Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

**Skin protection**
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

**Body Protection**
Complete suit protecting against chemicals. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

**Respiratory protection**
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multipurpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls.
If the respirator is the sole means of protection, use a full-face supplied air respirator.
Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).
Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

- a) Appearance Form: Purple liquid
- b) Odor: No data available
- c) Odor Threshold: No data available
- d) pH: 6-9
- e) Melting point/freezing point: No data available
- f) Initial boiling point and boiling range: 100 °C (212 °F)
- g) Flash point: >105 degrees C
- h) Evaporation rate: No data available
- i) Flammability (solid, gas): No data available
- j) Upper/lower flammability or explosive limits: No data available
- k) Vapor pressure: 760 mm @ 105 degrees C
- l) Vapor density: No data available
- m) Relative density: 1.391 g/cm³
- n) Water solubility: Complete solubility in all proportions
- o) Partition coefficient: nootanol/water: No data available
- p) Auto-ignition temperature: No data available
- q) Decomposition temperature: No data available
- r) Viscosity: No data available
- s) Explosive properties: Not explosive. Can explode in contact with sulfuric acid, peroxides, and metal powders.
- t) Oxidizing properties: Strong oxidizing agent.

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Acids, peroxides, and all combustible organic or readily oxidizable materials including inorganic oxidizable materials and metal powders. With hydrochloric acid, chlorine gas is liberated.

10.6 Hazardous decomposition products
Other decomposition products - No data available
In the event of fire: see section 5; when involved in a fire, sodium permanganate may form corrosive fumes.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
- Inhalation No data available
- Dermal No data available
Skin corrosion/irritation No data available
Serious eye damage/eye irritation No data available
Respiratory or skin sensitization No data available
Germ cell mutagenicity No data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity No data available
Specific target organ toxicity – single exposure No data available
Specific target organ toxicity –
Men exposed to manganese dusts showed a decrease in fertility. Chronic manganese poisoning primarily involves the central nervous system. Early symptoms include languor, sleepiness and weakness in the legs. A stolid mask-like appearance of the face, emotional disturbances such as uncontrollable laughter and a spastic gait with tendency to fall in walking are findings in more advanced cases. High incidence of pneumonia has been found in workers exposed to the dust or fume of some manganese compounds., Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema, burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache

**12. ECOLOGICAL INFORMATION**

**12.1 Toxicity**
No data available

**12.2 Persistence and degradability**
No data available

**12.3 Bioaccumulative potential**
No data available

**12.4 Mobility in soil**
No data available

**12.5 Results of PBT and vPvB assessment**
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

**12.6 Other adverse effects**
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

**13. DISPOSAL CONSIDERATIONS**
13.1 Waste treatment methods

Product
When it becomes a waste, sodium permanganate is considered a D001 hazardous (ignitable) waste. For disposal of sodium permanganate solutions, follow procedures in Section 6 and deactivate the permanganate to insoluble manganese dioxide. Dispose of it in a permitted landfill. Contact Hepure Technologies, Inc for additional recommendations.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 3214    Class: 5.1    Packing group: II
Proper shipping name: 49 CFR172.101 Permanganates, inorganic, aqueous solution, n.o.s. (Sodium permanganate)
Reportable Quantity (RQ):
Poison Inhalation Hazard: No
DOT Hazard Class: 49 CFR172.101    5.1
Hazard Class: 49 CFR172.101    Oxidizer

IMDG
UN number: 3214    Class: 5.1    Packing group: II EMS-No: F-H, S-Q
Proper shipping name: PERMANGANATES, INORGANIC, AQUEOUS SOLUTION, N.O.S. (Sodium permanganate)
Marine pollutant: yes

IATA
UN number: 3214    Class: 5.1    Packing group: II
Proper shipping name: Permanganates, inorganic, aqueous solution, n.o.s. (Sodium permanganate)

15. REGULATORY INFORMATION

Toxic Substances Control Act (TSCA)
All components of this product are listed in the Toxic Substances Control Act Inventory

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA):
Reportable Quantity - * pounds (RCRA hazardous waste)
SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 311 Components
- Acute Health: Yes
- Chronic Health: Yes
- Fire: Yes
- Sudden Release of Pressure: No
- Reactive: No

SARA 311 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 311.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

- Sodium permanganate
  - CAS-No.: 10101-50-5
  - Revision Date: 2007-07-01

Massachusetts Right To Know Components
No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know Components

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Revision Date</th>
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</thead>
<tbody>
<tr>
<td>Water</td>
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<td>Sodium permanganate</td>
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New Jersey Right To Know Components

<table>
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<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Revision Date</th>
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<tr>
<td>Water</td>
<td>7732-18-5</td>
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<tr>
<td>Sodium permanganate</td>
<td>10101-50-5</td>
<td>2007-07-01</td>
</tr>
</tbody>
</table>

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

- Acute Tox.  Acute toxicity
- Aquatic Acute  Acute aquatic toxicity
- Aquatic Chronic  Chronic aquatic toxicity
Eye Dam. Serious eye damage
H272 May intensify fire; oxidizer.
H302 Harmful if swallowed.
H314 Causes severe skin burns and eye damage.
H318 Causes serious eye damage.
H400 Very toxic to aquatic life.
H410 Very toxic to aquatic life with long lasting effects.
Ox. Sol. Oxidizing solids
Skin Corr. Skin corrosion

**HMIS Rating**
Health: 1
Flammability: 0
Physical Hazard: 0
Protective Equipment: D

**NFPA Rating**
Health hazard: 1
Fire Hazard: 0
Reactivity Hazard: 0
Special hazard: OX

**Further information**
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 properties of the product. Hepure Technologies, Inc. and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product.