SAFETY DATA SHEET
KLOZUR® ONE

1. PRODUCT AND COMPANY IDENTIFICATION

Product Identifier
Product Name KLOZUR® ONE
Other means of identification
UN/ID no UN 1505
Recommended use of the chemical and restrictions on use
Recommended Use: In situ and ex situ chemical oxidation of contaminants and compounds of concern for environmental remediation applications
Restrictions on Use No uses to be advised against were identified.
Manufacturer/Supplier PeroxyChem LLC
2005 Market Street
Suite 3200
Philadelphia, PA 19103
Phone: +1 267/ 422-2400 (General Information)
E-Mail: sdsinfo@peroxychem.com
Emergency telephone numbers For leak, fire, spill or accident emergencies, call:
1 800 / 424 9300 (CHEMTREC - U.S.A.)
1 703 / 527 3887 (CHEMTREC - Collect - All Other Countries)

2. HAZARDS IDENTIFICATION

Classification
OSHA Regulatory Status This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200)

<table>
<thead>
<tr>
<th>Hazard Class</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute toxicity - Oral</td>
<td>Category 4</td>
</tr>
<tr>
<td>Skin corrosion/irritation</td>
<td>Category 2</td>
</tr>
<tr>
<td>Serious eye damage/eye irritation</td>
<td>Category 2B</td>
</tr>
<tr>
<td>Respiratory sensitization</td>
<td>Category 1</td>
</tr>
<tr>
<td>Skin sensitization</td>
<td>Category 1</td>
</tr>
<tr>
<td>Specific target organ toxicity (single exposure)</td>
<td>Category 3</td>
</tr>
<tr>
<td>Oxidizing Solids</td>
<td>Category 3</td>
</tr>
</tbody>
</table>

GHS Label elements, including precautionary statements

EMERGENCY OVERVIEW
Precautionary Statements - Prevention
P261 - Avoid breathing dust.
P285 - In case of inadequate ventilation wear respiratory protection
P271 - Use only outdoors or in a well-ventilated area
P280 - Wear protective gloves/ protective clothing
P264 - Wash face, hands and any exposed skin thoroughly after handling
P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking
P220 - Keep/Store away from clothing/combustible materials
P221 - Take any precaution to avoid mixing with combustibles

Precautionary Statements - Response
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P337 + P313 - If eye irritation persists: Get medical advice/ attention
P302 + P352 - IF ON SKIN: Wash with plenty of water.
P333 + P313 - If skin irritation or rash occurs: Get medical advice/ attention
P304 + P341 - IF INHALED: If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing
P342 + P311 - If experiencing respiratory symptoms: Call a POISON CENTER or doctor
P301 + P312 - IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell
P330 - Rinse mouth
P370 + P378 - In case of fire: Use water spray for extinction

Precautionary Statements - Storage
P403 + P233 - Store in a well-ventilated place. Keep container tightly closed

Hazards not otherwise classified (HNOC)
No hazards not otherwise classified were identified.

Other Information Risk of decomposition by heat or by contact with incompatible materials

Unknown acute toxicity
0% of the mixture consists of ingredient(s) of unknown toxicity
3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium Persulfate</td>
<td>7775-27-1</td>
<td>95</td>
</tr>
<tr>
<td>Potassium permanganate</td>
<td>7722-64-7</td>
<td>&lt; 1</td>
</tr>
<tr>
<td>Trade secret</td>
<td>Proprietary</td>
<td>&lt; 5</td>
</tr>
</tbody>
</table>

Occupational exposure limits, if available, are listed in section 8

4. FIRST AID MEASURES

General Advice
Remove from exposure, lie down. Show this material safety data sheet to the doctor in attendance.

Eye Contact
Rinse thoroughly with plenty of water for at least 15 minutes, lifting lower and upper eyelids intermittently. Consult a physician.

Skin Contact
Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Get medical attention if irritation develops and persists.

Inhalation
Remove from exposure, lie down. If breathing is irregular or stopped, administer artificial respiration. Call a physician immediately.

Ingestion
Do NOT induce vomiting. Call a physician or poison control center immediately. Rinse mouth. Drink 1 or 2 glasses of water.

Most important symptoms and effects, both acute and delayed
Itching; Redness; Coughing and/or wheezing.

Indication of immediate medical attention and special treatment needed, if necessary
Treat symptomatically

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Water. Cool containers with flooding quantities of water until well after fire is out.

Unsuitable extinguishing media
Do not use carbon dioxide or other gas filled fire extinguishers; they will have little effect on decomposing persulfate.

Specific Hazards Arising from the Chemical
Decomposes under fire conditions to release oxygen that intensifies the fire.

Explosion data
Sensitivity to Mechanical Impact Not sensitive.
Sensitivity to Static Discharge Not sensitive.

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.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions
Keep off any unprotected persons. Avoid contact with the skin and the eyes. Avoid breathing dust. Wear personal protective equipment.

Other
Never add other substances or combustible waste to product residues.

Environmental Precautions
Prevent material from entering into soil, ditches, sewers, waterways, and/or groundwater. See Section 12, Ecological Information for more detailed information.
Methods for Containment
Vacuum, shovel or pump waste into a drum and label contents for disposal. Avoid dust formation. Store in closed container.

Methods for cleaning up
Clean up spill area and treat as special waste. Dispose of waste as indicated in Section 13.

7. HANDLING AND STORAGE

Handling
Wear personal protective equipment. Use only in area provided with appropriate exhaust ventilation. Avoid dust formation. Handle product only in closed system or provide appropriate exhaust ventilation at machinery. Avoid contact with skin and eyes. Avoid breathing dust. Remove and wash contaminated clothing before re-use. Reference to other sections.

Storage
Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat. Do not store near combustible materials. Avoid contamination of opened product. Keep away from food, drink and animal feedingstuffs. Avoid formation and deposition of dust.

Incompatible products
Acids, alkalis, halides (fluorides, chlorides, bromides), combustible materials, reducing agents and organic compounds.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters
Exposure Guidelines

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH</th>
<th>Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium Persulfate</td>
<td>TWA: 0.1 mg/m³</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>7775-27-1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potassium permanganate</td>
<td>TWA: 0.02 mg/m³</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>7722-64-7</td>
<td>TWA: 0.1 mg/m³</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Chemical name
British Columbia Quebec Ontario TWAEV Alberta

| Sodium Persulfate      | TWA: 0.1 mg/m³             | -         | TWA: 0.1 mg/m³ TWA: 0.1 mg/m³ |
| 7775-27-1              |                            |           |       |        |
| Potassium permanganate | TWA: 0.2 mg/m³             | TWA: 0.2 mg/m³ TWA: 0.02 mg/m³ respirable TWA: 0.1 mg/m³ inhalable |
| 7722-64-7              |                            |           |       |        |

Appropriate engineering controls

Engineering measures
Provide local exhaust or general ventilation adequate to maintain exposures below permissible exposure limits.

Individual protection measures, such as personal protective equipment

Eye/Face Protection
Eye protection recommended. Chemical goggles consistent with EN 166 or equivalent.

Skin and Body Protection
Wear long-sleeved shirt, long pants, socks, and shoes.

Hand Protection
Protective gloves: Neoprene gloves, Polyvinylchloride, Natural Rubber.

Respiratory Protection
If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn: particulate filtering facepiece respirators.

Hygiene measures
Keep away from food, drink and animal feeding stuffs. Do not eat, drink or smoke when using this product. Wash hands before breaks and after shifts. Keep work clothes separate, remove contaminated clothing - launder after open handling of product.
9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Crystalline solid
Physical State: Solid
Color: Light tan
Odor: odorless
Odor threshold: Not applicable
pH: 6.6 (1% solution)
Melting point/freezing point: 180 °C (Decomposes)
Boiling Point/Range: Decomposes upon heating
Flash point: Not flammable
Evaporation Rate: No information available
Flammability (solid, gas): Not flammable
Flammability Limit in Air: Not applicable
  Upper flammability limit: No information available
  Lower flammability limit: No information available
Vapor pressure: 6.07E-30 mm Hg at 25ºC
Vapor density: No information available
Density: 2.59 g/cm³ (crystal density)
Specific gravity: No information available
Water solubility: 575 g/l @ 25 ºC
Solubility in other solvents: No information available
Partition coefficient: No information available (inorganic)
Autoignition temperature: No evidence of combustion up to 600 ºC
Decomposition temperature: 81 ºC (SADT)
Viscosity, kinematic: No information available (Solid)
Viscosity, dynamic: No information available
Explosive properties: Not explosive
Oxidizing properties: oxidizer
Molecular weight: mixture
VOC content (%): Not applicable
Bulk density: No information available

10. STABILITY AND REACTIVITY

Reactivity: Oxidizer. Contact with other material may cause fire
Chemical Stability: Stable under normal conditions.
Possibility of Hazardous Reactions: None under normal processing.
Hazardous polymerization: Hazardous polymerization does not occur.
Conditions to avoid: Heat. Moisture.
Incompatible materials: Acids, alkalis, halides (fluorides, chlorides, bromides), combustible materials, reducing agents and organic compounds.

Hazardous Decomposition Products: Oxygen which supports combustion.

11. TOXICOLOGICAL INFORMATION

Product Information

Unknown acute toxicity: 0% of the mixture consists of ingredient(s) of unknown toxicity
LD50 Oral: Sodium Persulfate: 895 mg/kg (rat)
LD50 Dermal  Sodium Persulfate: > 10 g/kg  
LC50 Inhalation  Sodium Persulfate: >5.10 mg/L (4h) (rat)

Serious eye damage/eye irritation Irritating to eyes.
Skin corrosion/irritation Minimally irritating.

Sensitization Sodium Persulfate: May cause sensitization by inhalation and skin contact.

Information on toxicological effects

Symptoms Symptoms of allergic reaction may include rash, itching, swelling and trouble breathing.

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

Irritation Irritating to eyes, respiratory system and skin.
Corrosivity None.
Carcinogenicity Contains no ingredient listed as a carcinogen.

Mutagenicity Did not show mutagenic effects in animal experiments

Neurological effects Not neurotoxic

Reproductive toxicity This product is not recognized as reprotox by Research Agencies.
Developmental toxicity None known.
Teratogenicity Not teratogenic in animal studies.

STOT - single exposure May cause respiratory irritation.
STOT - repeated exposure Not classified.

Target organ effects Eyes, Lungs.

Aspiration hazard No information available.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Ecotoxicity effects Ecotoxicity effects of component substances

<table>
<thead>
<tr>
<th>Active Ingredient(s)</th>
<th>Duration</th>
<th>Species</th>
<th>Value</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium Persulfate</td>
<td>96 h LC50</td>
<td>Rainbow trout</td>
<td>163</td>
<td>mg/L</td>
</tr>
<tr>
<td>Sodium Persulfate</td>
<td>48 h LC50</td>
<td>Daphnia magna</td>
<td>133</td>
<td>mg/L</td>
</tr>
<tr>
<td>Sodium Persulfate</td>
<td>96 h LC50</td>
<td>Grass shrimp</td>
<td>519</td>
<td>mg/L</td>
</tr>
<tr>
<td>Sodium Persulfate</td>
<td>72 h EC50</td>
<td>Algae Selenastrum capricornutum</td>
<td>116</td>
<td>mg/L</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Toxicity to algae</th>
<th>Toxicity to fish</th>
<th>Toxicity to Microorganisms</th>
<th>Toxicity to daphnia and other aquatic invertebrates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium permanganate</td>
<td>72 h EC50: 0.43-0.80 mg/L</td>
<td>96 h LC50: 2.97 - 3.11 mg/L (Cyprinus carpio) 96 h LC50: 3.16 - 3.77 mg/L (Cyprinus carpio) 96 h LC50: = 2.3 mg/L (Lepomis macrochirus) flow-through</td>
<td>48 h EC50: 0.06 mg/L (daphnia magna)</td>
<td></td>
</tr>
</tbody>
</table>
### 96 h LC50

<table>
<thead>
<tr>
<th>Species</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lepomis macrochirus</td>
<td>1.8 - 5.6 mg/L</td>
</tr>
<tr>
<td>Oncorhynchus mykiss</td>
<td>1.08 - 1.38 mg/L</td>
</tr>
<tr>
<td>Carassius auratus</td>
<td>3.3 - 3.93 mg/L</td>
</tr>
</tbody>
</table>

**Persistence and degradability**

Biodegradability does not pertain to inorganic substances. The organic components are biodegradable and can be expected to contribute to BOD.

**Bioaccumulation**

Does not bioaccumulate.

**Mobility**

Dissociates into ions.

**Other Adverse Effects**

None known.

### 13. DISPOSAL CONSIDERATIONS

**Waste disposal methods**

This material, as supplied, is a hazardous waste according to federal regulations (40 CFR 261). It must undergo special treatment, e.g., at suitable disposal site, to comply with local regulations.

**Contaminated Packaging**

Empty remaining contents. Dispose of in accordance with local regulations.

### 14. TRANSPORT INFORMATION

#### DOT

**UN/ID no**

UN 1505

**Proper Shipping Name**

Sodium Persulfate Mixture

**Hazard class**

5.1

**Packing Group**

III

#### TDG

**UN/ID no**

UN 1505

**Proper Shipping Name**

Sodium Persulfate Mixture

**Hazard class**

5.1

**Packing Group**

III

#### MEX

**UN/ID no**

UN 1505

**Proper Shipping Name**

Sodium Persulfate Mixture

**Hazard class**

5.1

**Packing Group**

III

#### ICAO/IATA

**UN/ID no**

UN 1505

**Proper Shipping Name**

Sodium Persulfate Mixture

**Hazard class**

5.1

**Packing Group**

III

#### IMDG/IMO

**UN/ID no**

UN 1505

**Proper Shipping Name**

Sodium Persulfate Mixture
15. REGULATORY INFORMATION

U.S. Federal Regulations

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

SARA 311/312 Hazard Categories
Acute health hazard: Yes
Chronic health hazard: No
Fire hazard: Yes
Sudden release of pressure hazard: No
Reactive Hazard: No

Clean Water Act
This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CWA - Reportable Quantities</th>
<th>CWA - Toxic Pollutants</th>
<th>CWA - Priority Pollutants</th>
<th>CWA - Hazardous Substances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium permanganate 7722-64-7</td>
<td>100 lb</td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

CERCLA/EPCRA
This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CERCLA Hazardous Substances RQs (40 CFR 302.4)</th>
<th>SARA Sec 304 Extremely Hazardous Substance RQ (40 CFR 355 Appendix A)</th>
<th>SARA Section 302 EHS Threshold Planning Quantity (40 CFR 355)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium permanganate 7722-64-7</td>
<td>100 lb</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

US State Regulations

U.S. State Right-to-Know Regulations
This product contains the following substances regulated under state Right-to-Know laws:

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Massachusetts</th>
<th>New Jersey</th>
<th>Pennsylvania</th>
<th>Illinois</th>
<th>Rhode Island</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium Persulfate</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Potassium permanganate</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

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

International Inventories
16. OTHER INFORMATION

<table>
<thead>
<tr>
<th>NFPA</th>
<th>Health Hazards</th>
<th>Flammability</th>
<th>Stability</th>
<th>Special Hazards</th>
<th>OX</th>
</tr>
</thead>
<tbody>
<tr>
<td>HMIS</td>
<td>Health Hazards</td>
<td>Flammability</td>
<td>Physical hazard</td>
<td>Special precautions</td>
<td>J</td>
</tr>
</tbody>
</table>

NFPA/HMIS Ratings Legend
Special Hazards: OX = Oxidizer
Protection=J (Safety goggles, gloves, apron, combination dust and vapor respirator)

Revision date: 2017-01-31
Revision note: Initial Release
Issuing Date: 2017-05-01

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Prepared By:

PeroxyChem

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End of Safety Data Sheet