1. PRODUCT AND COMPANY IDENTIFICATION

Product Identifier

Product Name: Klozur® SP

CAS-No: 7775-27-1

Synonyms: Sodium Persulfate; Sodium Peroxydisulfate; Disodium Peroxydisulfate; Peroxydisulfuric acid, disodium salt; Peroxydisulfuric acid, sodium salt.

Alternate Commercial Name: Klozur® Persulfate

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)
1 303/ 389-1409 (Medical - U.S. - Call Collect)

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</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**

### Danger

**Hazard Statements**
- H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled
- H335 - May cause respiratory irritation
- H319 - Causes serious eye irritation
- H315 - Causes skin irritation
- H317 - May cause an allergic skin reaction
- H302 - Harmful if swallowed
- H272 - May intensify fire; oxidizer

### Precautionary Statements - Prevention
- P261 - Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray
- 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
- P302 + P352 - IF ON SKIN: Wash with plenty of water.
- P333 + P313 - If skin irritation or rash occurs: Get medical advice/ attention
- P362 - Take off contaminated clothing and wash before reuse
- P334 + P340 - IF INHALED: Remove person to fresh air and keep 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 for extinction

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

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**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>&gt; 99</td>
</tr>
<tr>
<td>Sodium sulfate</td>
<td>7757-82-6</td>
<td>&lt; 2</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

**General Advice**
May produce an allergic reaction.

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

**Flammable properties**
Contact with combustible material may cause 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

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>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>British Columbia</th>
<th>Quebec</th>
<th>Ontario TWAEV</th>
<th>Alberta</th>
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</thead>
<tbody>
<tr>
<td>Sodium Persulfate</td>
<td>TWA: 0.1 mg/m³</td>
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<tr>
<td>7775-27-1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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 feedingstuffs. 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.

General information
Protective engineering solutions should be implemented and in use before personal protective equipment is considered.
9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance  Crystalline solid
Physical State  Solid
Color  White
Odor  odorless
Odor threshold  Not applicable
pH  6.0 (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 25°C
Vapor density  No information available
Density  2.59 g/cm³ (crystal density)
Specific gravity  No information available
Water solubility  42 % @ 25 °C
Solubility in other solvents  No information available
Partition coefficient  No information available (inorganic)
Autoignition temperature  No evidence of combustion up to 600°C
Decomposition temperature  > 100 °C (assume)
Viscosity, kinematic  No information available (Solid)
Viscosity, dynamic  No information available
Explosive properties  Not explosive
Oxidizing properties  oxidizer
Molecular weight  238.1
VOC content (%)  Not applicable
Bulk density  1.12 g/cm³ (loose)

10. STABILITY AND REACTIVITY

Reactivity  None under normal use conditions. Oxidizer. Contact with other material may cause fire.
Chemical Stability  Stable.
Possibility of Hazardous Reactions  None under normal processing.
Hazardous polymerization  Hazardous polymerization does not occur.
Conditions to avoid  Heat. Moisture.

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.

Component Information

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>LD50 Oral</th>
<th>LD50 Dermal</th>
<th>LC50 Inhalation</th>
<th>NOAEL Oral Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium Persulfate</td>
<td>895 mg/kg (Rat)</td>
<td>&gt; 10000 mg/kg (Rabbit)</td>
<td>&gt; 21.6 mg/L (Rat) 4h</td>
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<tr>
<td>(7775-27-1)</td>
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<tr>
<td>Sodium sulfate</td>
<td>&gt; 10000 mg/kg (Rat)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>(7757-82-6)</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Sodium Persulfate (7775-27-1)</th>
<th>Duration</th>
<th>Species</th>
<th>Value</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>Sodium Persulfate</td>
<td>96 h LC50</td>
<td>Rainbow trout</td>
<td>163</td>
<td>mg/L</td>
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<tr>
<td>Sodium Persulfate</td>
<td>48 h LC50</td>
<td>Daphnia magna</td>
<td>133</td>
<td>mg/L</td>
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<tr>
<td>Sodium Persulfate</td>
<td>96 h LC50</td>
<td>Grass shrimp</td>
<td>519</td>
<td>mg/L</td>
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<tr>
<td>Sodium Persulfate</td>
<td>72 h EC50</td>
<td>Algae Selenastrum capricornutum</td>
<td>116</td>
<td>mg/L</td>
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</tbody>
</table>

Persistence and degradability
Biodegradability does not pertain to inorganic substances.

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

<table>
<thead>
<tr>
<th>UN/ID no</th>
<th>UN 1505</th>
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<tr>
<td>Proper Shipping Name</td>
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<tr>
<td>Hazard class</td>
<td>5.1</td>
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<td>Packing Group</td>
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TDG

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MEX

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ICAO

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ICAO/IATA

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<td>SODIUM PERSULFATE</td>
</tr>
<tr>
<td>Hazard class</td>
<td>5.1</td>
</tr>
</tbody>
</table>
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
This product is not subject to reporting under the Emergency Planning and Community Right-to-Know rule.

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)

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

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></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sodium sulfate</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

CANADA

Environmental Emergencies
This product contains no substances listed under Canada’s Environmental Emergency regulations.

Canadian National Pollutant Release Inventory
This product contains no substances reportable under Canada's National Pollutant Release Inventory regulations.

International Inventories

<table>
<thead>
<tr>
<th>Component</th>
<th>TSCA (United States)</th>
<th>DSL (Canada)</th>
<th>EINECS/EL INCs (Europe)</th>
<th>ENCS (Japan)</th>
<th>China (IECSC)</th>
<th>KECL (Korea)</th>
<th>PICCS (Philippines)</th>
<th>AICS (Australia)</th>
<th>NZIoC (New Zealand)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium Persulfate 7775-27-1 ( &gt; 99 )</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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</tr>
<tr>
<td>Sodium sulfate 7757-82-6 ( &lt; 2 )</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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</tr>
</tbody>
</table>

Mexico

Mexico - Grade  Slight risk, Grade 1

16. OTHER INFORMATION

<table>
<thead>
<tr>
<th>NFPA</th>
<th>Health Hazards</th>
<th>Flammability</th>
<th>Stability</th>
<th>Special Hazards</th>
<th>Special precautions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>1</td>
<td></td>
<td>OX</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:  2018-07-13
Revision note  SDS sections updated: 3.
Issuing Date:  2017-03-17

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Prepared By:

PeroxyChem

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End of Safety Data Sheet