1. PRODUCT AND COMPANY IDENTIFICATION

Product Identifier

Product Name: Klozur® KP
CAS-No: 7727-21-1
Synonyms: Potassium Peroxydisulfate; Dipotassium Peroxydisulfate; Peroxydisulfuric acid, dipotassium salt; Peroxydisulfuric acid, potassium salt.

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)
4001 - 204937 (CHEMTREC - PRC)
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 Category</th>
<th>Description</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
- 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
- P362 - Take off contaminated clothing and wash before reuse
- P304 + 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

**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>Potassium Persulfate</td>
<td>7727-21-1</td>
<td>&gt; 98</td>
</tr>
<tr>
<td>Potassium Sulfate</td>
<td>7778-80-5</td>
<td>&lt; 2</td>
</tr>
</tbody>
</table>

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. In case of contact, immediately flush eyes with plenty of water. 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.

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
Knock down dust with water spray. Avoid penetration into waterways, sewers, soil or groundwater. Local authorities should be advised if significant spillages cannot be contained.

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. Avoid breathing dust. Handle product only in closed system or provide appropriate exhaust ventilation at machinery. Avoid contact with skin and eyes. Remove and wash contaminated clothing before re-use.

**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**
- Bases, Halides, Oxidizing agents, Strong reducing agents, Combustible materials.

### 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>Potassium Persulfate</td>
<td>TWA: 0.1 mg/m³</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>7727-21-1</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>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium Persulfate</td>
<td>TWA: 0.1 mg/m³</td>
<td>-</td>
<td>TWA: 0.1 mg/m³</td>
<td>TWA: 0.1 mg/m³</td>
</tr>
<tr>
<td>7727-21-1</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 permissable 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.

**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

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Crystalline solid</td>
</tr>
<tr>
<td>Physical State</td>
<td>Solid</td>
</tr>
<tr>
<td>Color</td>
<td>White</td>
</tr>
<tr>
<td>Odor</td>
<td>odorless</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>&gt; 100 °C (Decomposes)</td>
</tr>
<tr>
<td>Boiling Point/Range</td>
<td>Decomposes upon heating</td>
</tr>
<tr>
<td>Flash point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>No information available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Not flammable</td>
</tr>
<tr>
<td>Flammability Limit in Air</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Upper flammability limit</td>
<td>No information available</td>
</tr>
<tr>
<td>Lower flammability limit</td>
<td>No information available</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>6.07E-30 mm Hg at 25°C</td>
</tr>
<tr>
<td>Vapor density</td>
<td>No information available</td>
</tr>
<tr>
<td>Density</td>
<td>2.48 g/cm³ (crystal density)</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>No information available</td>
</tr>
<tr>
<td>Water solubility</td>
<td>5.6 % @ 25 °C</td>
</tr>
<tr>
<td>Solubility in other solvents</td>
<td>No information available</td>
</tr>
<tr>
<td>Partition coefficient</td>
<td>No information available (inorganic)</td>
</tr>
<tr>
<td>Autoignition temperature</td>
<td>No evidence of combustion up to 600 °C</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>&gt; 100 °C (assume)</td>
</tr>
<tr>
<td>Viscosity, kinematic</td>
<td>No information available (Solid)</td>
</tr>
<tr>
<td>Viscosity, dynamic</td>
<td>No information available</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>Not explosive</td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>oxidizer</td>
</tr>
<tr>
<td>Molecular weight</td>
<td>270.31</td>
</tr>
<tr>
<td>Bulk density</td>
<td>1.30 g/cm³ (loose)</td>
</tr>
</tbody>
</table>

10. STABILITY AND REACTIVITY

Reactivity                      Strong oxidizer. Oxidizer. Contact with other material may cause fire.

Chemical Stability              Decomposition can occur on exposure to heat or moisture.

Possibility of Hazardous Reactions Use of persulfates in chemical reactions requires appropriate precautions and design considerations for pressure and thermal relief.

Decomposing persulfates will evolve large volumes of gas and/or vapor, can accelerate exponentially with heat generation, and create significant and hazardous pressures if contained and not properly controlled or mitigated.

Use with alcohols in the presence of water has been demonstrated to generate conditions that require rigorous adherence to process safety methods and standards to prevent escalation to an uncontrolled reaction.

Hazardous polymerization        Hazardous polymerization does not occur.

Conditions to avoid             Moisture; Heat. (decomposes at temperatures >100 °C).

Incompatible materials          Bases, Halides, Oxidizing agents, Strong reducing agents, Combustible materials.

Hazardous Decomposition Products Incomplete combustion and thermolysis may produce gases of varying toxicity such as carbon monoxide, carbon dioxide, various hydrocarbons, aldehydes and soot.

11. TOXICOLOGICAL INFORMATION

Product Information
Unknown acute toxicity
0% of the mixture consists of ingredient(s) of unknown toxicity

LD50 Oral
1130 mg/kg (rat) (Potassium Persulfate)

LD50 Dermal
> 10000 10,000 mg/kg (rat) (Potassium Persulfate)

LC50 Inhalation
> 42.9 mg/L (rat) (Potassium Persulfate)

Serious eye damage/eye irritation
Irritating to eyes.

Skin corrosion/irritation
Not irritating in animal studies.

Sensitization
Sensitizing to skin and respiratory system.

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>Potassium Persulfate</td>
<td>1130 mg/kg (rat)</td>
<td>&gt;10,000 kg/kg (rat)</td>
<td>&gt; 42.9 mg/L (rat)</td>
<td></td>
</tr>
<tr>
<td>(7727-21-1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potassium Sulfate</td>
<td>= 6600 mg/kg (Rat)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(7778-80-5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Information on toxicological effects

Symptoms
No information available.

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

Carcinogenicity
Did not show carcinogenic effects in animal experiments.

Mutagenicity
In vivo tests did not show mutagenic effects.

Reproductive toxicity
This product is not recognized as reprotox by Research Agencies.

STOT - single exposure
May cause respiratory irritation.

STOT - repeated exposure
Not classified.

Subchronic toxicity
Oral (NOAEL) = 131.5 mg/kg bw (Potassium Persulfate)
Inhalation (NOAEC) = 10.3 mg/m³ (Ammonium Persulfate)
Dermal: No data available

Target organ effects
Eyes, Skin, Respiratory System.

Aspiration hazard
No information available.
12. ECOLOGICAL INFORMATION

Ecotoxicity

Ecotoxicity effects
Not expected to have significant environmental effects, based on data for similar substances.

<table>
<thead>
<tr>
<th>Potassium Persulfate (7727-21-1)</th>
<th>Active Ingredient(s)</th>
<th>Duration</th>
<th>Species</th>
<th>Value</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium persulfate</td>
<td>96 h LC50</td>
<td>Onchorhyncus mykiss</td>
<td>76.3</td>
<td>mg/L</td>
<td></td>
</tr>
<tr>
<td>Potassium persulfate</td>
<td>48 h EC50</td>
<td>Water flea</td>
<td>120</td>
<td>mg/L</td>
<td></td>
</tr>
<tr>
<td>Potassium persulfate</td>
<td>72 h EC50</td>
<td>Marine algae (Phaeodactylum tricornutum)</td>
<td>136</td>
<td>mg/L</td>
<td></td>
</tr>
<tr>
<td>Potassium persulfate</td>
<td>96 h LC50</td>
<td>Turbot (Scophthalmus maximus)</td>
<td>107.6</td>
<td>mg/L</td>
<td></td>
</tr>
<tr>
<td>Potassium persulfate</td>
<td>18 h EC10</td>
<td>Pseudomonas putida</td>
<td>36</td>
<td>mg/L</td>
<td></td>
</tr>
<tr>
<td>Potassium persulfate</td>
<td>5 d</td>
<td>Abra Alba</td>
<td>11</td>
<td>mg/L</td>
<td></td>
</tr>
<tr>
<td>Potassium persulfate</td>
<td>96 h LC50</td>
<td>Grass shrimp</td>
<td>391</td>
<td>mg/L</td>
<td></td>
</tr>
<tr>
<td>Potassium persulfate</td>
<td>24 h EC50</td>
<td>Daphnia magna</td>
<td>635.7</td>
<td>mg/L</td>
<td></td>
</tr>
</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.

US EPA Waste Number
D001.

Contaminated Packaging
Dispose of in accordance with local regulations.

14. TRANSPORT INFORMATION

DOT

<table>
<thead>
<tr>
<th>UN/ID no</th>
<th>Proper Shipping Name</th>
<th>Hazard class</th>
<th>Packing Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>1492</td>
<td>Potassium persulfate</td>
<td>5.1</td>
<td>III</td>
</tr>
</tbody>
</table>

TDG

<table>
<thead>
<tr>
<th>UN/ID no</th>
<th>Proper Shipping Name</th>
<th>Hazard class</th>
<th>Packing Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>1492</td>
<td>Potassium persulfate</td>
<td>5.1</td>
<td>III</td>
</tr>
</tbody>
</table>

ICAO/IATA

<table>
<thead>
<tr>
<th>UN/ID no</th>
<th>Proper Shipping Name</th>
<th>Hazard class</th>
</tr>
</thead>
<tbody>
<tr>
<td>1492</td>
<td>Potassium persulfate</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>Potassium Persulfate</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</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>Potassium Persulfate 7727-21-1 ( &gt; 98%)</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>
<td>X</td>
</tr>
<tr>
<td>Potassium Sulfate 7778-80-5 ( &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>
<td>X</td>
</tr>
</tbody>
</table>

Mexico

Mexico - Grade Slight risk, Grade 1

16. OTHER INFORMATION

NFPA | Health Hazards 1 | Flammability 0 | Stability 1 | Special Hazards OX |
HMIS | Health Hazards 1 | Flammability 0 | Physical hazard 1 | Special precautions J |

NFPA/HMIS Ratings Legend

Severe = 4; Serious = 3; Moderate = 2; Slight = 1; Minimal = 0

Protection=J (Safety goggles, gloves, apron, combination dust and vapor respirator)

Revision date: 2018-07-13
Revision note: SDS sections updated: 3.

Disclaimer

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Prepared By:

PeroxyChem
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End of Safety Data Sheet