1. PRODUCT AND COMPANY IDENTIFICATION

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Piperacillin Sodium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Name</td>
<td>Piperacillin Sodium</td>
</tr>
<tr>
<td>Chemical Name</td>
<td>(2S, 5R, 6R)-6-[(R)-2-(4-ethyl-2,3-dioxo-1-piperazinecarboxamido)-2-phenylacetamido]-3, -3-dimethyl-7-oxo-4-thia-1-azabicyclo[3.2.0]heptane-2-carboxylate</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Piperacillin Sodium, Piperacil</td>
</tr>
<tr>
<td>Product Use</td>
<td>Active pharmaceutical ingredient</td>
</tr>
<tr>
<td>Classification</td>
<td>Anti-infective Agent</td>
</tr>
<tr>
<td>Supplier</td>
<td>Wyeth</td>
</tr>
<tr>
<td></td>
<td>P.O. Box 8299</td>
</tr>
<tr>
<td></td>
<td>Philadelphia, PA 19101 USA.</td>
</tr>
<tr>
<td></td>
<td>Telephone: 1-610-688-4400</td>
</tr>
</tbody>
</table>

2. HAZARDS IDENTIFICATION

- **Potential Physical Hazards**: Powders and solids are presumed to be combustible.

- **Potential Health Effects**
  - **Eyes**: May cause mechanical eye irritation.
  - **Skin**: Not available
  - **Inhalation**: Not available
  - **Ingestion**: Not available
  - **Other**: Hypersensitivity (anaphylactic/anaphylactoid) reactions (including shock) have been reported in patients receiving therapy with penicillins. Individuals with a history of penicillin hypersensitivity or a history of sensitivity to multiple allergens should avoid contact. The most common effects may include bleeding disorders, neuromuscular excitability, convulsions, joint pain, fever, hives or itching, liver toxicity, inflammation of the kidney, skin rash, decrease in the number of white blood cells; mental disturbances, seizures and diarrhea.

  - May cause harm to breastfed babies.

- **Therapeutic Target Organ(s)**: None.

- **Potential Environmental Effects**: There is no known ecological information for this product.

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Emergency Telephone Number: Chemtrec USA, Puerto Rico, Canada 1-800-424-9300
Chemtrec International 1-703-527-3887
3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Common Name</th>
<th>CAS-No</th>
<th>Composition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Piperacillin sodium</td>
<td>59703-84-3</td>
<td>100%</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

**Eye Contact**
In the case of contact with eyes, rinse immediately with plenty of water for 15 minutes and seek medical advice.

**Skin Contact**
Take off contaminated clothing and shoes immediately. Wash off immediately with soap and plenty of water. If skin irritation persists, call a physician.

**Inhalation**
Move to fresh air. Artificial respiration and/or oxygen may be necessary. If symptoms persist, call a physician.

**Ingestion**
If symptoms persist, call a physician. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person.

**Aggravated Medical Conditions**
Allergy to penicillins.

**Notes to Physician**
Serious anaphylactic/anaphylactoid reactions (including shock) require immediate emergency treatment with epinephrine. Oxygen, intravenous steroids, and airway management, including incubation, should also be administered as indicated.

5. FIRE-FIGHTING MEASURES

**Flammable Properties**
Presumed to be a combustible particulate solid.

**Extinguishing Media**
Suitable Extinguishing Media
Use water spray, foam, dry chemical or carbon dioxide.

Unsuitable Extinguishing Media
Do NOT use water jet.

**Fire Fighting**
Evacuate area and fight fire from a safe distance. Cool closed containers exposed to fire with water spray. In the event of fire and/or explosion do not breathe fumes.

**Hazardous Combustion Products**
Carbon oxides, nitrogen oxides.

**Protective Equipment and Precautions for Firefighters**
In the event of fire, wear self-contained breathing apparatus and special protective equipment for fire fighters.

6. ACCIDENTAL RELEASE MEASURES

**Personal Precautions**
Refer to protective measures listed in Sections 7 and 8.

**Environmental Precautions**
Prevent product from entering drains. Local authorities should be advised if a significant spill cannot be contained.

**Methods for Containment**
Not available

**Methods for Cleaning up**
Take up mechanically and collect in suitable container for disposal. Clean contaminated surface thoroughly. Avoid formation of dust and aerosols.
7. HANDLING AND STORAGE

Handling
For personal protection see Section 8. Handle in accordance with good industrial hygiene and safety practice. Skin should be washed after contact. Avoid formation of dust and aerosols.

Dust can form an explosive mixture in air. Take precautionary measures against static discharges. Keep away from open flames, hot surfaces and sources of ignition. When processing, use electrical classified equipment.

Storage
No special safety precautions required. Keep container tightly closed.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Exposure Guideline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Piperacillin sodium</td>
<td>3000 mcg/m³</td>
</tr>
</tbody>
</table>

Risk Based Exposure Control Classification 2

Engineering Controls
Apply technical measures to comply with the occupational exposure guideline. Local exhaust ventilation is needed for limited open handling or where aerosols may be generated.

Personal Protective Equipment
Eye/face Protection: Provide eye protection based on risk assessment.
Skin Protection: Wear nitrile or latex gloves. Wear protective garment.
Respiratory Protection: Base respirator selection on a risk assessment.
General Hygiene Considerations: When using, do not eat, drink or smoke. General industrial hygiene practice. Wash hands before breaks and at the end of workday.
Other: Limit access to only personnel trained in the safe handling of this material. Consult a health and safety professional for specific PPE, respirator, and risk assessment guidance.

9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Pharmaceutical powder</td>
</tr>
<tr>
<td>Color</td>
<td>White to off-white</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>Not available</td>
</tr>
<tr>
<td>Molecular Formula</td>
<td>C₂₃H₂₆N₅NaO₇S</td>
</tr>
<tr>
<td>pH</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>539.54</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Solubility</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Partition Coefficient (n-octanol/water)</td>
<td>&lt; -2.0</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Physical State</td>
<td>Solid</td>
</tr>
<tr>
<td>Odor</td>
<td>Not available</td>
</tr>
<tr>
<td>Water Solubility</td>
<td>Soluble in water</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>
10. STABILITY AND REACTIVITY

Chemical Stability
Stable at room temperature.

Conditions to Avoid
No data available

Materials to Avoid
Oxidizing materials.

Hazardous Decomposition Products
None under normal use.

Possibility of Hazardous Reactions
None under normal use.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Piperacillin sodium

LD50 Oral
- 10 mg/kg rats
- 10 mg/kg mice

Acute Dermal Irritation
Not available

Primary Eye Irritation
Not available

Sensitization
Not available

Multiple Dose Toxicity

Piperacillin sodium

No Toxicologic Effect

Dose/Species/Study Length:
Multiple doses used in reproduction studies carried out in mice and rats showed no evidence of impaired fertility at half of the maximum recommended human daily dose.

Maximum Tolerated Dose (MTD), Oral

Piperacillin sodium

Carcinogenicity
Long-term animal toxicity studies to evaluate the carcinogenic potential have not been conducted.

Genetic Toxicity

Reproductive Toxicity
Studies in rats and mice have shown no evidence of impaired fertility or harm to the fetus.

Developmental Toxicity
No teratogenic effects were observed in mice and rats.

Piperacillin sodium

Target Organ(s) of Toxicity
No data available
12. ECOLOGICAL INFORMATION

Chemical Fate Information
Not available

Ecotoxicity
Not available

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method
Dispose of in accordance with local and national regulations.

14. TRANSPORT INFORMATION

Transport Information
This material is not classified as hazardous for transport.

U.S. Department of Transport (DOT)
Not regulated

Canadian Transport of Dangerous Goods (TDG)
Not regulated

International Civil Aviation Organization (ICAO)
Not regulated

International Air Transport Association (IATA)
Not regulated

International Maritime Dangerous Goods (IMDG)/International Maritime Organization (IMO)
Not regulated

Transport of Dangerous Goods by Rail (RID)
Not regulated

Transport of Dangerous Goods by Road (ADR)
Not regulated

Transportation of Dangerous Goods via Inland Waterways (ADN)
Not regulated

15. REGULATORY INFORMATION

USA

Federal Regulations

OSHA Regulatory Status
This material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200)

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 40n of the Code of Federal Regulations, Part 372.

SARA 311/312 Hazardous Categorization

Acute Health Hazard
No

Chronic Health Hazard
No

Fire Hazard
No

Sudden Release of Pressure Hazard
No

Reactive Hazard
No

This product does not contain any HAPs.
State Regulations

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

Canada
Not classified

WHMIS Hazard Class
Non-controlled

European Union
In accordance with EC directives or respective national laws, the product does not need to be classified nor labeled.

16. OTHER INFORMATION

Prepared By
Wyeth Department of Environment, Health & Safety

Format
This MSDS was prepared in accordance with ANSI Z400.1-2004.

List of References
Pipracil MSDS
Zosyn MSDS
OEG Rationale June 1985

Revision Summary
Changes to Section 2 due to changes in Pipracil Package Insert.

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End of MSDS