1. Product and Company Identification

Product Code: 18457
Product Name: Novobiocin Sodium Salt
Company Name: Cayman Chemical Company
1180 E. Ellsworth Rd.
Ann Arbor, MI 48108
Web site address: www.caymanchem.com
Emergency Contact: CHEMTREC Within USA and Canada: +1 (800)424-9300
CHEMTREC Outside USA and Canada: +1 (703)527-3887
Information: Cayman Chemical Company +1 (734)971-3335

For research use only, not for human or veterinary use.

Intended Use: Albamycin; Cathomycin sodium;

2. Hazards Identification

Warning

GHS Signal Word: Warning
GHS Hazard Phrases: H317: May cause an allergic skin reaction.
H319: Causes serious eye irritation.
GHS Precaution Phrases: P261: Avoid breathing {dust/fume/gas/mist/vapors/spray}.
P264: Wash {hands} thoroughly after handling.
P272: Contaminated work clothing should not be allowed out of the workplace.
P280: Wear {protective gloves/protective clothing/eye protection/face protection}.

GHS Response Phrases: P302+352: IF ON SKIN: Wash with plenty of soap and water.
P305+351+338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P333+313: If skin irritation or rash occurs, seek medical advice/attention.
P337+313: If eye irritation persists, get medical advice/attention.
P362+364: Take off contaminated clothing and wash it before reuse.

GHS Storage and Disposal Phrases: Please refer to Section 7 for Storage and Section 13 for Disposal information.

Potential Health Effects (Acute and Chronic): Causes serious eye irritation.
Material may be irritating to the mucous membranes and upper respiratory tract.
May be harmful by inhalation, ingestion, or skin absorption.
May cause an allergic skin reaction.
May cause skin or respiratory system irritation.

To the best of our knowledge, the toxicological properties have not been thoroughly investigated.

3. Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Hazardous Components (Chemical Name)</th>
<th>Concentration</th>
<th>RTECS #</th>
</tr>
</thead>
<tbody>
<tr>
<td>1476-53-5</td>
<td>Benzamide, n-(7-((3-o-(aminocarbonyl)-5,5-di-c-methyl-4-o-methyl-alpha-l-lyxopyranosyl)oxy)-4-hydro)</td>
<td>100.0 %</td>
<td>RD5425000</td>
</tr>
</tbody>
</table>
4. First Aid Measures

Emergency and First Aid Procedures:

In Case of Inhalation: Remove to fresh air. If not breathing, give artificial respiration or give oxygen by trained personnel. Get immediate medical attention.

In Case of Skin Contact: Immediately wash skin with soap and plenty of water for at least 15 minutes. Remove contaminated clothing. Get medical attention if symptoms occur. Wash clothing before reuse.

In Case of Eye Contact: Hold eyelids apart and flush eyes with plenty of water for at least 15 minutes. Have eyes examined and tested by medical personnel.

In Case of Ingestion: Wash out mouth with water provided person is conscious. Never give anything by mouth to an unconscious person. Get medical attention. Do NOT induce vomiting unless directed to do so by medical personnel.

5. Fire Fighting Measures

Flash Pt: No data.
Explosive Limits: LEL: No data. UEL: No data.
Autoignition Pt: No data.
Suitable Extinguishing Media: Use alcohol-resistant foam, carbon dioxide, water, or dry chemical spray.
Use water spray to cool fire-exposed containers.

Unsuitable Extinguishing Media: A solid water stream may be inefficient.

Fire Fighting Instructions: As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent), and full protective gear to prevent contact with skin and eyes.

6. Accidental Release Measures

Contain spill and collect, as appropriate.
Transfer to a chemical waste container for disposal in accordance with local regulations.

Avoid raising and breathing dust, and provide adequate ventilation.
Protective Precautions:
As conditions warrant, wear a NIOSH approved self-contained breathing apparatus, or respirator, and appropriate personal protection (rubber boots, safety goggles, and heavy rubber gloves).
Protective Equipment and Emergency Procedures:
Take steps to avoid release into the environment, if safe to do so.
Environmental Precautions:
Contain spill and collect, as appropriate.
Steps To Be Taken In Case Material Is Released Or Spilled:
Transfer to a chemical waste container for disposal in accordance with local regulations.

7. Handling and Storage

Avoid breathing dust/fume/gas/mist/vapours/spray.
Precautions To Be Taken in Handling:
Avoid prolonged or repeated exposure.
Precautions To Be Taken in Storing:
Keep container tightly closed.
Store in accordance with information listed on the product insert.

8. Exposure Controls/Personal Protection

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Partial Chemical Name</th>
<th>OSHA TWA</th>
<th>ACGIH TWA</th>
<th>Other Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1476-53-5</td>
<td>Benzamide, n-(7-((3-o-(aminocarbonyl)-5,5-di-c-methyl-4-o-methyl-alpha-l-lyxopyranosyl)oxy)-4-hydro</td>
<td>No data.</td>
<td>No data.</td>
<td>No data.</td>
</tr>
</tbody>
</table>

GHS format
Respiratory Equipment (Specify Type): NIOSH approved respirator, as conditions warrant.
Eye Protection: Safety glasses
Protective Gloves: Compatible chemical-resistant gloves
Other Protective Clothing: Lab coat
Engineering Controls (Ventilation etc.): Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.
Work/Hygienic/Maintenance Practices: Do not take internally. Facilities storing or utilizing this material should be equipped with an eyewash and a safety shower. Wash thoroughly after handling.

9. Physical and Chemical Properties

Physical States: [ ] Gas [ ] Liquid [X] Solid
Appearance and Odor: solid
Melting Point: No data.
Boiling Point: No data.
Flash Pt: No data.
Evaporation Rate: No data.
Flammability (solid, gas): No data available.
Explosive Limits: LEL: No data. UEL: No data.
Vapor Pressure (vs. Air or mm Hg): No data.
Vapor Density (vs. Air = 1): No data.
Specific Gravity (Water = 1): No data.
Solubility in Water: No data.
Solubility Notes: Soluble in: EtOH; MeOH; H2O; DMSO;
Percent Volatile: No data.
Autoignition Pt: No data.
Molecular Formula & Weight: C31H35N2O11•Na 634.6

10. Stability and Reactivity

Stability: Unstable [ ] Stable [X]
Conditions To Avoid: No data available.
Incompatibility - Materials To Avoid: No data available.
Hazardous Decomposition or Byproducts: No data available.
Polymerization: Will occur [ ] Will not occur [X]
Stability Note(s): Stable if stored in accordance with information listed on the product insert.
11. Toxicological Information

Toxicological Information: The toxicological effects of this product have not been thoroughly studied.
Novobiocin Sodium Salt - Toxicity Data: Oral LD50 (rat): 3500 mg/kg; Subcutaneous LD50 (rat): 450 mg/kg; Oral LD50 (mouse): 962 mg/kg; Intraperitoneal LD50 (mouse): 262 mg/kg;
Chronic Toxicological Effects: Novobiocin Sodium Salt - Investigated as a mutagen.

Only select Registry of Toxic Effects of Chemical Substances (RTECS) data is presented here. See actual entry in RTECS for complete information.
Novobiocin Sodium Salt RTECS Number: RD5425000

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Hazardous Components (Chemical Name)</th>
<th>NTP</th>
<th>IARC</th>
<th>ACGIH</th>
<th>OSHA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1476-53-5</td>
<td>Benzamide, (n-(7-((3-o-(aminocarbonyl)-5,5-di-c-methyl-4-o-methyl-alpha-l-lyxopyranosyl)oxy)-4-hydro}))</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
</tbody>
</table>

12. Ecological Information

General Ecological Information: Avoid release into the environment.
Runoff from fire control or dilution water may cause pollution.

13. Disposal Considerations

Waste Disposal Method: Dispose in accordance with local, state, and federal regulations.

14. Transport Information

LAND TRANSPORT (US DOT):
- DOT Proper Shipping Name: Not dangerous goods.
- DOT Hazard Class:
- UN/NA Number:

LAND TRANSPORT (European ADR/RID):
- ADR/RID Shipping Name: Not dangerous goods.
- UN Number:
- Hazard Class:

AIR TRANSPORT (ICAO/IATA):
- ICAO/IATA Shipping Name: Not dangerous goods.

Additional Transport Information: Transport in accordance with local, state, and federal regulations.

15. Regulatory Information

EPA SARA (Superfund Amendments and Reauthorization Act of 1986) Lists

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Hazardous Components (Chemical Name)</th>
<th>S. 302 (EHS)</th>
<th>S. 304 RQ</th>
<th>S. 313 (TRI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1476-53-5</td>
<td>Benzamide, (n-(7-((3-o-(aminocarbonyl)-5,5-di-c-methyl-4-o-methyl-alpha-l-lyxopyranosyl)oxy)-4-hydro}))</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Hazardous Components (Chemical Name)</th>
<th>Other US EPA or State Lists</th>
</tr>
</thead>
<tbody>
<tr>
<td>1476-53-5</td>
<td>Benzamide, (n-(7-((3-o-(aminocarbonyl)-5,5-di-c-methyl-4-o-methyl-alpha-l-lyxopyranosyl)oxy)-4-hydro}))</td>
<td>CAA HAP,ODC: No; CWA NPDES: No; TSCA: No; CA PROP.65: No</td>
</tr>
<tr>
<td>Regulatory Information Statement:</td>
<td>This SDS was prepared in accordance with 29 CFR 1910.1200 and Regulation (EC) No.1272/2008.</td>
<td></td>
</tr>
<tr>
<td>----------------------------------</td>
<td>--------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>16. Other Information</td>
<td>No data available.</td>
<td></td>
</tr>
<tr>
<td>Additional Information About This Product:</td>
<td>DISCLAIMER: This information is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes.</td>
<td></td>
</tr>
</tbody>
</table>