MATERIAL SAFETY DATA SHEET

Product Name: Norepinephrine Bitartrate Injection, USP (Levophed®)

1. CHEMICAL PRODUCT AND COMPANY INFORMATION

Manufacturer Name  Hospira, Inc.
And Address  275 North Field Drive
Lake Forest, Illinois  60045
USA

Emergency Telephone  CHEMTREC:  800 424-9300
Hospira, Inc.  224 212-2055

Product Name  Norepinephrine Bitartrate Injection, USP (Levophed®)

Synonyms  None

2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient Name  Norepinephrine Bitartrate
Chemical Formula  C₈H₁₁NO₃

<table>
<thead>
<tr>
<th>Component</th>
<th>Approximate Percent by Weight</th>
<th>CAS Number</th>
<th>RTECS Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norepinephrine</td>
<td>0.1</td>
<td>51-41-2</td>
<td>DN5950000</td>
</tr>
<tr>
<td>Water</td>
<td>99</td>
<td>7732-18-5</td>
<td>ZC0110000</td>
</tr>
</tbody>
</table>

3. HAZARD INFORMATION

Emergency Overview  In clinical use, this material stimulates the sympathetic nervous system and the heart. Possible target organs include the cardiovascular system, nervous system, reproductive system, and fetus.

Occupational Exposure Potential  Information on the absorption of this compound via ingestion, inhalation or skin contact is not available. Avoid liquid aerosol generation and skin contact.

Signs and Symptoms  No signs or symptoms from occupational exposure are known. Clinical data suggest the following: slowed heart rate, restlessness, palpitations, tremors, weakness, headache, elevated blood pressure, arrhythmias, and electrolyte imbalance.

Medical Conditions Aggravated by Exposure  Hypersensitivity to the material and/or similar materials. Clinical data suggest cardiovascular disease, blood volume deficiencies, or thrombotic ailments.
Product Name: Norepinephrine Bitartrate Injection, USP (Levophed®)

4. FIRST AID MEASURES

Eye Contact: Remove from source of exposure. Flush with copious amounts of water. If irritation persists or signs of toxicity occur, seek medical attention. Provide symptomatic/supportive care as necessary.

Skin Contact: Remove from source of exposure. Flush with copious amounts of water. If irritation persists or signs of toxicity occur, seek medical attention. Provide symptomatic/supportive care as necessary.

Inhalation: Remove from source of exposure. If signs of toxicity occur, seek medical attention. Provide symptomatic / supportive care as necessary.

Ingestion: Remove from source of exposure. If signs of toxicity occur, seek medical attention. Provide symptomatic / supportive care as necessary.

5. FIRE FIGHTING MEASURES

Flammability: Non-flammable

Fire & Explosion Hazard: None

Extinguishing Media: Use extinguishing media appropriate for primary cause of fire.

Special Fire Fighting Procedures: No special provisions required beyond normal fire fighting equipment such as flame and chemical resistant clothing and self contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

Spill Cleanup and Disposal: Absorb with suitable material and clean affected area with soap and water. Dispose of materials according to the applicable federal, state, or local regulations.

7. HANDLING AND STORAGE

Handling: Protect from light by retaining in carton until contents have been used.

Storage: No special storage required for hazard control. For product protection store at controlled room temperature of 15-30°C (59-86°F).

Special Precautions: Protect from freezing, light and extreme heat.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

<table>
<thead>
<tr>
<th>Component</th>
<th>Exposure limits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OSHA-PEL</td>
</tr>
<tr>
<td>Norepinephrine</td>
<td>8 hr TWA: Not Established</td>
</tr>
</tbody>
</table>

Notes: OSHA PEL: US Occupational Safety and Health Administration – Permissible Exposure Limit
ACGIH TLV: American Conference of Governmental Industrial Hygienists – Threshold Limit Value.
EEL: Employee Exposure Limit.
TWA: 8 hour Time Weighted Average.
STEL: 15-minute Short Term Exposure Limit.
**Product Name:** Norepinephrine Bitartrate Injection, USP (Levophed®)

**Respiratory Protection**
Respiratory protection is not needed during normal product use.

**Skin Protection**
If solution contact with unprotected skin is likely, use of impervious gloves is a prudent practice.

**Eye Protection**
Eye protection is not required during expected product use conditions but may be warranted should a splash potential exist.

**Engineering Controls**
Engineering controls are not needed during normal product use conditions.

9. **PHYSICAL/CHEMICAL PROPERTIES**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appearance/Physical</strong></td>
<td>Clear, colorless solution</td>
</tr>
<tr>
<td><strong>State</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Odor</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Boiling Point</strong></td>
<td>Approximately that of water (100 °C, 212 °F).</td>
</tr>
<tr>
<td><strong>Freezing Point</strong></td>
<td>Approximately that of water (0 °C, 32 °F).</td>
</tr>
<tr>
<td><strong>Vapor Pressure</strong></td>
<td>Approximately that of water (17.5 mm Hg at 20 °C).</td>
</tr>
<tr>
<td><strong>Vapor Density (Air=1)</strong></td>
<td>Not Applicable</td>
</tr>
<tr>
<td><strong>Evaporation Rate</strong></td>
<td>Not Applicable</td>
</tr>
<tr>
<td><strong>Bulk Density</strong></td>
<td>1.019 g/mL at 25°C</td>
</tr>
<tr>
<td><strong>Specific Gravity</strong></td>
<td>Approximately that of water (1.0)</td>
</tr>
<tr>
<td><strong>Solubility</strong></td>
<td>Water</td>
</tr>
<tr>
<td><strong>pH</strong></td>
<td>3.0-4.5</td>
</tr>
</tbody>
</table>

10. **STABILITY AND REACTIVITY**

**Chemical Stability**
Stable under standard use and storage conditions.

**Incompatibilities**
Iron salts, alkalies, or oxidizing agents

**Hazardous**
Toxic fumes of nitrogen oxides.

11. **TOXICOLOGICAL INFORMATION:**

**Acute Toxicity – Oral:**

<table>
<thead>
<tr>
<th>Ingredient(s)</th>
<th>Percent</th>
<th>Test Type</th>
<th>Value</th>
<th>Units</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norepinephrine</td>
<td>100</td>
<td>LD50</td>
<td>20</td>
<td>mg/kg</td>
<td>Mice</td>
</tr>
</tbody>
</table>

LD50: Dosage needed to produce 50% mortality.
Product contains approximately 0.1% Norepinephrine.

**Acute Toxicity – Dermal:**

<table>
<thead>
<tr>
<th>Ingredient(s)</th>
<th>Percent</th>
<th>Test Type</th>
<th>Value</th>
<th>Units</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norepinephrine</td>
<td>100</td>
<td>LD50(sc)</td>
<td>5.0-7.6</td>
<td>mg/kg</td>
<td>Mice</td>
</tr>
</tbody>
</table>

LD50 (sc) is the value for skin contact
Product Name: Norepinephrine Bitartrate Injection, USP (Levophed®)

Mutagenicity  Not Determined.

Target Organ Effects  In clinical use target organ effects include the cardiovascular system, nervous system, reproductive system, and fetus.

12. ECOLOGICAL INFORMATION:

Aquatic Toxicity  Not Available

13. DISPOSAL CONSIDERATIONS:

Waste Disposal  Disposal should be performed in accordance with the federal, state or local regulatory requirements.

Container Handling and Disposal  Dispose of container and unused contents in accordance with federal, state, and local regulations.

14. TRANSPORTATION INFORMATION

DOT  Not Regulated

Notes:  DOT - US Department of Transportation Regulations

15. REGULATORY INFORMATION

TSCA Status  Not Regulated
CERCLA Status  Not Regulated
SARA Status  Not Regulated
RCRA Status  Not Regulated
PROP 65 (Calif.)  Not Regulated

Notes:  TSCA  Toxic Substance Control Act
        CERCLA,  US EPA law, Comprehensive Environmental Response, Compensation, and Liability Act
        SARA  Superfund Amendments and Reauthorization Act
        RCRA  US EPA, Resource Conservation and Recovery Act
        Prop 65, California Proposition 65

16. OTHER INFORMATION:

MSDS Coordinator  Global Occupational Toxicology
Date Prepared  September 15, 2005
Date Revised  October 21, 2008

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