MATERIAL SAFETY DATA SHEET

Product Name: Deferoxamine Mesylate for Injection & Desferrioxamine Mesilate for Injection

1. CHEMICAL PRODUCT AND COMPANY INFORMATION

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

Hospira Australia Pty Ltd
1 Lexia Place
Mulgrave, VIC 3170
Australia

Emergency Telephone
CHEMTREC: North America: 800-424-9300;
International 1-703-527-3887; Australia (02) 8014 4880

Hospira, Inc., Non-Emergency 224-212-2000

Product Name
Deferoxamine Mesylate for Injection & Desferrioxamine Mesilate for Injection

Synonyms

2. COMPOSITION/INFORMATION ON INGREDIENTS

Active Ingredient Name
Deferoxamine Mesylate

Chemical Formula
C_{25}H_{48}N_{6}O_{8}• CH_{4}O_{3}S

<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>Deferoxamine Mesylate</td>
<td>100</td>
<td>138-14-7</td>
<td>UG5310000</td>
</tr>
</tbody>
</table>

3. HAZARD INFORMATION

Carcinogen List

<table>
<thead>
<tr>
<th>Substance</th>
<th>IARC</th>
<th>NTP</th>
<th>OSHA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deferoxamine Mesylate</td>
<td>Not Listed</td>
<td>Not Listed</td>
<td>Not Listed</td>
</tr>
</tbody>
</table>

Emergency Overview
Deferoxamine Mesylate for Injection is a powder containing deferoxamine mesylate powder, an iron chelating agent. Clinically, deferoxamine mesylate is used for the treatment of acute iron intoxication and of chronic iron overload. In the workplace, this product should be considered potentially irritating to the eyes and respiratory tract. Based on clinical use, possible target organs may include the eyes, respiratory and gastrointestinal systems, and auditory system (hearing).

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

Signs and Symptoms
None known from work place exposures. Clinical use has been associated with eye and hearing changes, rash, allergic reactions (urticaria), gastrointestinal upset, diarrhea, flushing, increased
heart rate and lowered blood pressure. Ocular and auditory disturbances have been reported when deferoxamine mesylate was given over prolonged periods of time at high doses. The ocular disturbances include blurred of vision; cataracts (after prolonged administration in chronic iron overload), decreased visual acuity (including visual loss, visual defects, scotoma, impaired peripheral, color, and night vision), optic neuritis, corneal opacities, and retinal pigmentary abnormalities. The auditory abnormalities reported include tinnitus and hearing loss (including high frequency sensorineural hearing loss).

Medical Conditions Aggravated by Exposure
Pre-existing hypersensitivity to this material; pre-existing ocular, gastrointestinal, or auditory (hearing) ailments.

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 None anticipated for this product. However, many organic powders will combust at high temperatures.

Fire & Explosion Hazard None anticipated for this product. Avoid the creation of dusty environments.

Extinguishing media As with any fire, 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 Isolate area around spill. Put on suitable protective clothing and equipment as specified by site spill procedures. Collect powder using methods that minimize the creation of airborne dusts. If the spill occurs after reconstitution, absorb the liquid with suitable material and clean affected area with soap and water. Dispose of spill materials according to the applicable federal, state, or local regulations.

7. HANDLING AND STORAGE

Handling No special handling required under conditions of normal product use.
Storage
No special storage required for hazard control. For product protection, follow storage recommendations noted on the product case label, the primary container label, or the product insert.

Special Precautions
No special precautions required for hazard control.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

<table>
<thead>
<tr>
<th>Component</th>
<th>Type</th>
<th>mg/m3</th>
<th>ppm</th>
<th>µg/m3</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deferoxamine Mesylate</td>
<td>Hospira EEL</td>
<td>N/A</td>
<td>N/A</td>
<td>2000</td>
<td>8hr TWA</td>
</tr>
</tbody>
</table>

Respiratory protection
Respiratory protection is normally not needed during intended product use. However, if the generation of dusts or aerosols is likely, and engineering controls are not considered adequate to control potential airborne exposures, the use of an approved air-purifying respirator with a HEPA cartridge (N95 or equivalent) is recommended under conditions where airborne dust or aerosol concentrations are not expected to be excessive. Since protection provided by air purifying respirators is limited, a powered air purifying respirator or supplied air should be considered during an uncontrolled release event, if exposure levels are not known, or during events where air-purifying respirators may not provide adequate protection. A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions require respirator use. Personnel who wear respirators should be fit tested and approved for respirator use as required.

Skin protection
If skin contact with the product formulation is likely, the use of latex or nitrile gloves is recommended.

Eye protection
Eye protection is normally not required during intended product use. However, if eye contact is likely to occur, the use of chemical safety goggles (as a minimum) is recommended.

Engineering Controls
Engineering controls are normally not needed during the normal use of this product.

9. PHYSICAL/CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Appearance/Physical State</th>
<th>Solid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>Sterile white to off white powder</td>
</tr>
<tr>
<td>Odor</td>
<td>NA</td>
</tr>
<tr>
<td>Odor Threshold:</td>
<td>NA</td>
</tr>
<tr>
<td>pH:</td>
<td>Ranges from 3.7 to 5.5 for a 10% w/v solution</td>
</tr>
<tr>
<td>Melting point/Freezing point:</td>
<td>NA</td>
</tr>
<tr>
<td>Initial Boiling Point/Boiling Point</td>
<td>NA</td>
</tr>
<tr>
<td>Range:</td>
<td>NA</td>
</tr>
<tr>
<td>Evaporation Rate:</td>
<td>NA</td>
</tr>
<tr>
<td>Flammability (solid, gas):</td>
<td>NA</td>
</tr>
<tr>
<td>Upper/Lower Flammability or Explosive Limits:</td>
<td>NA</td>
</tr>
<tr>
<td>Vapor Pressure:</td>
<td>NA</td>
</tr>
<tr>
<td>Vapor Density:</td>
<td>NA</td>
</tr>
<tr>
<td>Specific Gravity:</td>
<td>NA</td>
</tr>
<tr>
<td>Solubility:</td>
<td>It is freely soluble in water and slightly soluble in methanol.</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water:</td>
<td>NA</td>
</tr>
</tbody>
</table>

3
10. STABILITY AND REACTIVITY

Reactivity Not determined.

Chemical Stability Stable under standard use and storage conditions.

Hazardous Reactions Not determined.

Conditions to avoid Not determined.

Incompatibilities Not determined.

Hazardous decomposition products Not determined. During thermal decomposition, it may be possible to generate irritating vapors and/or toxic fumes of carbon oxides (COx), nitrogen oxides (NOx), and sulfur oxides (SOx).

Hazardous Polymerization Not anticipated to occur with this product.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity
Not determined for the product formulation. Information for the ingredients is as follows:

<table>
<thead>
<tr>
<th>Ingredient(s)</th>
<th>Percent</th>
<th>Test Type</th>
<th>Route of Administration</th>
<th>Value</th>
<th>Units</th>
<th>Species</th>
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</thead>
<tbody>
<tr>
<td>Deferoxamine Mesylate 100</td>
<td>LD50</td>
<td>Intravenous</td>
<td></td>
<td>330</td>
<td>mg/kg</td>
<td>Rat</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>273</td>
<td>mg/kg</td>
<td>Mouse</td>
</tr>
<tr>
<td>Deferoxamine Mesylate 100</td>
<td>LD50</td>
<td>Oral</td>
<td></td>
<td>17,300</td>
<td>mg/kg</td>
<td>Rat</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15,200</td>
<td>mg/kg</td>
<td>Mouse</td>
</tr>
<tr>
<td>Deferoxamine Mesylate 100</td>
<td>LD50</td>
<td>Intraperitoneal</td>
<td></td>
<td>1240</td>
<td>mg/kg</td>
<td>Mouse</td>
</tr>
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</table>

Aspiration Hazard None anticipated from normal handling of this product.

Dermal Irritation/Corrosion None anticipated from normal handling of this product.

Ocular Irritation/Corrosion None anticipated from normal handling of this product. However, inadvertent contact of this product with eyes may produce irritation and redness.

Dermal or Respiratory Sensitization None anticipated from normal handling of this product. In clinical use, generalized rash, urticaria, anaphylactic reaction with or without shock, and angioedema have been reported in patients.

Reproductive Effects Delayed ossification in mice and skeletal anomalies in rabbits were reported after deferoxamine mesylate was administered in daily doses up to 4.5 times the maximum daily human dose. No adverse effects were noted in similar studies in rats.

Mutagenicity Cytotoxicity may occur since deferoxamine mesylate has been shown to inhibit DNA synthesis in vitro.
Product Name: Deferoxamine Mesylate for Injection & Desferrioxamine Mesilate for Injection

Carcinogenicity
Long-term carcinogenicity studies in animals have not been performed with deferoxamine mesylate.

Target Organ Effects
Work place exposure to this product may produce ocular and respiratory irritation. Based on clinical use, possible target organs may include the eyes, respiratory system, gastrointestinal system, and auditory system (hearing).

12. ECOLOGICAL INFORMATION

Aquatic Toxicity
Not determined for product.

Persistence/Biodegradability
Not determined for product.

Bioaccumulation
Not determined for product.

Mobility in Soil
Not determined for product.

13. DISPOSAL CONSIDERATIONS

Waste Disposal
All waste materials must be properly characterized. Further, 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

ADR/ADG/ DOT STATUS:
Not regulated

IMDG STATUS:
Not regulated

ICAO/IATA STATUS:
Not regulated

Transport Comments:
None

15. REGULATORY INFORMATION

USA Regulations

<table>
<thead>
<tr>
<th>Substance</th>
<th>TSCA Status</th>
<th>CERCLA Status</th>
<th>SARA 302 Status</th>
<th>SARA 313 Status</th>
<th>PROP 65 Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deferoxamine Mesylate</td>
<td>Not Listed</td>
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<td>Not Listed</td>
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<td>Not Listed</td>
</tr>
</tbody>
</table>

RCRA Status
Not Listed

U.S. OSHA Classification
Target Organ Toxin

Classification
Possible Irritant

GHS Classification
*In the EU, classification under GHS/CLP does not apply to certain substances and mixtures, such as medicinal products as defined in Directive 2001/83/EC, which are in the finished state, intended for the final user:
Product Name: Deferoxamine Mesylate for Injection & Desferrioxamine Mesilate for Injection

Hazard Class  Not Applicable
Hazard Category  Not Applicable
Signal Word  Not Applicable
Symbol  Not Applicable
Prevention  P260 - Do not breathe dust/fume/gas/mist/vapors/spray.
Hazard Statement  Not Applicable

Response: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists, get medical attention. Wash hands after handling.

Get medical attention if you feel unwell.

EU Classification*
*Medicinal products are exempt from the requirements of the EU Dangerous Preparations Directive. Information provided below is for the pure drug substance Deferoxamine Mesylate.

Classification(s): Not Applicable
Symbol: Not Applicable
Indication of Danger: Not Applicable
Risk Phrases: Not Applicable
Safety Phrases: S23 - Do not breathe vapor.
S24/25 - Avoid contact with skin and eyes.
S37/39 - Wear suitable gloves and eye/face protection.

16. OTHER INFORMATION:

Notes:
ACGIH TLV  American Conference of Governmental Industrial Hygienists – Threshold Limit Value
CAS  Chemical Abstracts Service Number
CERCLA  US EPA law, Comprehensive Environmental Response, Compensation, and Liability Act
DOT  US Department of Transportation Regulations
EEL  Employee Exposure Limit
IATA  International Air Transport Association
LD50  Dosage producing 50% mortality
NA  Not applicable/Not available
NE  Not established
NIOSH  National Institute for Occupational Safety and Health
OSHA PEL  US Occupational Safety and Health Administration – Permissible Exposure Limit
Prop 65  California Proposition 65
RCRA  US EPA, Resource Conservation and Recovery Act
RTECS  Registry of Toxic Effects of Chemical Substances
SARA  Superfund Amendments and Reauthorization Act
STEL  15-minute Short Term Exposure Limit
TSCA  Toxic Substance Control Act
TWA  8-hour Time Weighted Average
MSDS Coordinator: Hospira GEHS
Date Prepared: 09/21/2011
Obsolete Date: 11/05/2009

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