



## MATERIAL SAFETY DATA SHEET

**Product Name: Epinephrine Injection, USP**

### 1. CHEMICAL PRODUCT AND COMPANY INFORMATION

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

**Emergency Telephone** CHEMTREC: North America: 800-424-9300; International: 1-703-527-3887  
**Hospira, Inc., Non-emergency** 224 212-2055

**Product Name** Epinephrine Injection, USP

**Synonyms** 4-[1-hydroxy-2-(methylamino) ethyl]-1,2 benzenediol.

### 2. COMPOSITION/INFORMATION ON INGREDIENTS

**Active Ingredient Name** L-Epinephrine  
**Chemical Formula** C<sub>9</sub>H<sub>13</sub>NO<sub>3</sub>

| Component     | Approximate Percent by Weight | CAS Number | RTECS Number |
|---------------|-------------------------------|------------|--------------|
| L-Epinephrine | ≤ 0.1                         | 51-43-4    | DO2625000    |

Non-hazardous ingredients include water for injection. Hazardous ingredients present at less than 1% may include sodium chloride, citric acid, sodium citrate, sodium metabisulfite and hydrochloric acid.

### 3. HAZARD INFORMATION

**Emergency Overview** Epinephrine Injection, USP, contains epinephrine, a vasoconstrictor agent. In the workplace, this material should be considered a potent drug and possibly irritating to the skin and eyes. Based on clinical use, possible target organs include the nervous system, cardiovascular system, eyes, and respiratory system.

**Occupational Exposure Potential** Though not well absorbed, inhalation or topical application can produce systemic effects. Avoid liquid aerosol generation and skin contact.

**Signs and Symptoms** None known from occupational exposure. In clinical use, serious adverse effects may include rapid and large increases in blood pressure, cerebral hemorrhage, pulmonary arterial hypertension resulting in edema, hyperglycemia, and cardiac arrhythmia with ventricular fibrillation. Other adverse effects may include fearfulness, anxiety, sweating, nervousness, palpitations, tenseness, restlessness, headache, tremor, dizziness and lightheadedness, fever, chills, nausea, vomiting, respiratory difficulty, tachycardia, dilated pupils, blurred vision, cyanosis, ECG changes, disruption of cardiac rhythm, hypertension, metabolic acidosis, and injury to the heart. Locally, tissue necrosis can result at the injection site due to vasoconstriction. Ocular use has produced conjunctival irritation (burning, stinging, tearing and rebound redness).

**Medical Conditions Aggravated by Exposure** Pre-existing nervous system, cardiovascular system, ocular, or respiratory system ailments. Pre-existing hypersensitivity to this material.

**Carcinogen Lists:** **IARC:** Not listed      **NTP:** Not listed      **OSHA:** Not listed

#### **4. FIRST AID MEASURES**

|                     |   |
|---------------------|---|
| <b>Eye Contact</b>  | 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. |
| <b>Skin Contact</b> | 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. |
| <b>Inhalation</b>   | Remove from source of exposure. If signs of toxicity occur, seek medical attention. Provide symptomatic/supportive care as necessary.   |
| <b>Ingestion</b>    | Remove from source of exposure. If signs of toxicity occur, seek medical attention. Provide symptomatic/supportive care as necessary.   |

#### **5. FIRE FIGHTING MEASURES**

|   |  |
|---|--|
| <b>Flammability</b>                     | None anticipated from this aqueous product.  |
| <b>Fire &amp; Explosion Hazard</b>      | None anticipated from this aqueous product.  |
| <b>Extinguishing Media</b>              | As with any fire, use extinguishing media appropriate for primary cause of fire.   |
| <b>Special Fire Fighting Procedures</b> | 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**

|                                   |  |
|-----------------------------------|--|
| <b>Spill Cleanup and Disposal</b> | Isolate area around spill. Put on suitable protective clothing and equipment as specified by site spill procedures. Absorb any 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**

|                            |   |
|----------------------------|---|
| <b>Handling</b>            | No special handling required under conditions of normal product use.  |
| <b>Storage</b>             | No special storage required for hazard control. For product protection, follow USP controlled room temperature storage recommendations noted on the product case label, the primary container label, or the product insert. |
| <b>Special Precautions</b> | No special precautions are required for hazard controls.  |

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Exposure Guidelines

| Component     | Exposure Limits           |                           |                           |   |
|---------------|---------------------------|---------------------------|---------------------------|---|
|               | OSHA-PEL                  | ACGIH-TLV                 | AIHA WEEL                 | Hospira EEL   |
| L-Epinephrine | 8 hr TWA: Not Established | 8 hr TWA: Not Established | 8 hr TWA: Not Established | 8 hr TWA: 1 mcg/m <sup>3</sup><br>STEL: 20 mcg/m <sup>3</sup> |

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.

**Respiratory Protection**      Respiratory protection is normally not needed during intended product use. However, if the generation of aerosols is likely, or respiratory protection is desired, 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. 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

|  |   |
|--|---|
| <b>Appearance/Physical State</b>                     | Epinephrine is a white, crystalline powder. Epinephrine Injection is a clear, colorless liquid. |
| <b>Odor</b>  | Not determined.   |
| <b>Odor Threshold:</b>                               | NA  |
| <b>pH:</b>   | 3.3 (2.5 to 5.0)  |
| <b>Melting point/Freezing point:</b>                 | NA  |
| <b>Initial Boiling Point/Boiling Point Range</b>     | NA  |
| <b>Evaporation Rate:</b>                             | NA  |
| <b>Flammability (solid, gas):</b>                    | NA  |
| <b>Upper/Lower Flammability or Explosive Limits:</b> | NA  |
| <b>Vapor Pressure</b>                                | NA  |
| <b>Vapor Density (Air =1)</b>                        | NA  |
| <b>Evaporation Rate</b>                              | NA  |
| <b>Specific Gravity</b>                              | NA  |
| <b>Solubility</b>                                    | Very soluble in water and alcohol.  |
| <b>Log Partition coefficient: n-octanol/water:</b>   | NA  |
| <b>Auto-ignition temperature</b>                     | NA  |
| <b>Decomposition temperature</b>                     | NA  |

**10. STABILITY AND REACTIVITY**

|   |   |
|---|---|
| <b>Reactivity</b>                       | Not determined.   |
| <b>Chemical Stability</b>               | Stable under standard use and storage conditions.   |
| <b>Hazardous Reactions</b>              | Not determined  |
| <b>Conditions to avoid</b>              | Not determined  |
| <b>Incompatibilities</b>                | Not determined  |
| <b>Hazardous Decomposition Products</b> | Not determined. During thermal decomposition, it may be possible to generate irritating vapors and/or toxic fumes of carbon oxides (COx) and nitrogen oxides (NOx). |
| <b>Hazardous Polymerization</b>         | 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:

| <b>Ingredient(s)</b>      | <b>Percent</b> | <b>Test Type</b> | <b>Route of Administration</b> | <b>Value</b> | <b>Units</b> | <b>Species</b> |
|---------------------------|----------------|------------------|--------------------------------|--------------|--------------|----------------|
| Epinephrine               | 100            | LD50             | Intravenous                    | 150          | mcg/kg       | Rat            |
|                           |                |                  |                                | 217          | mcg/kg       | Mouse          |
|                           |                |                  |                                | 50           | mcg/kg       | Rabbit         |
|                           |                |                  |                                | 100          | mcg/kg       | Dog            |
| Epinephrine               | 100            | LD50             | Dermal                         | 62           | mg/kg        | Rat            |
| Epinephrine Hydrochloride | 100            | LD50             | Oral                           | 24           | mg/kg        | Rat            |
| Epinephrine Hydrochloride | 100            | LD50             | Intravenous                    | 140          | mcg/kg       | Mouse          |
| Epinephrine Hydrochloride | 100            | LD50             | Intraperitoneal                | 4.7          | mg/kg        | Mouse          |

LD 50: Dosage that produces 50% mortality.

|  |   |
|--|---|
| <b>Aspiration Hazard</b>                   | None anticipated from normal handling of this product. Inadvertent inhalation of small amounts of this product may produce irritation and possibly bronchial dilation.    |
| <b>Dermal Irritation/Corrosion</b>         | None anticipated from normal handling of this product. However, inadvertent contact with this product may be irritating to broken skin and mucous membranes.              |
| <b>Ocular Irritation/Corrosion</b>         | None anticipated from normal handling of this product. However, inadvertent contact of this product with eyes may produce irritation, dilated pupils, and blurred vision. |
| <b>Dermal or Respiratory Sensitization</b> | None anticipated from normal handling of this product.  |

**11. TOXICOLOGICAL INFORMATION: continued**

|                             |   |
|-----------------------------|---|
| <b>Reproductive Effects</b> | No teratogenic effect was noted in offspring of pregnant rats given continuous infusions of epinephrine at a dose about 8 times the normal human dose. An increase in the frequency of cleft palate was noted in the offspring of one strain of mice treated during pregnancy with epinephrine at doses that were 40-80 times the normal human dose. An increase in the frequency of fetal loss was noted in pregnant mice and rabbits given epinephrine at doses that were 200 and 85 times, respectively, the human therapeutic dose. The frequency of malformations was not increased in offspring of hamsters treated during pregnancy with 25 times the human subcutaneous dose. |
| <b>Mutagenicity</b>         | Salmonella gene mutation tests with L-epinephrine were negative in the TA100 strain in the presence of S9 metabolic activation, but equivocal in the absence of S9. No mutagenic activity was observed in strains TA98, TA1535, or TA1537 with or without S9. Results noted in a CHO cell assay for induction of sister chromatid exchanges were considered negative and equivocal in the presence and absence of S9 activation, respectively.  |
| <b>Carcinogenicity</b>      | No data found for epinephrine. By analogy, in a chronic aerosol inhalation studies in rats and mice, epinephrine hydrochloride did not significantly increase the incidence of tumors over controls in these animals. Increased incidences of suppurative inflammation, dilatation of the nasal glands in rats and mice, and hyperplasia of the respiratory epithelium in rats only were noted in this study.   |
| <b>Target Organ Effects</b> | Based on clinical use, possible target organs include the nervous system, cardiovascular system, eyes, and respiratory system.  |

**12. ECOLOGICAL INFORMATION**

|                                     |                             |
|-------------------------------------|-----------------------------|
| <b>Aquatic Toxicity</b>             | Not determined for product. |
| <b>Persistence/Biodegradability</b> | Not determined for product. |
| <b>Bioaccumulation</b>              | Not determined for product. |
| <b>Mobility in Soil</b>             | Not determined for product. |

**13. DISPOSAL CONSIDERATIONS**

|  |  |
|--|--|
| <b>Waste Disposal</b>                  | All wastes must be properly characterized by the waste generator. Disposal should be performed in accordance with the federal, state or local regulatory requirements. |
| <b>Container Handling and Disposal</b> | Dispose of container and unused contents in accordance with federal, state and local regulations.  |

**14. TRANSPORTATION INFORMATION**

**DOT STATUS:** Not Regulated  
**Proper Shipping Name:** NA  
**Hazard class:** NA  
**Un number:** NA  
**Packing group:** NA  
**Reportable quantity:** NA

**ICAO/IATA STATUS** Not regulated  
**Proper shipping name:** NA  
**Hazard class:** NA  
**Un number:** NA  
**Packing group:** NA  
**Reportable quantity:** NA

**IMDG STATUS** Not regulated

**Proper shipping name:** NA  
**Hazard class:** NA  
**Un number:** NA  
**Packing group:** NA  
**Reportable quantity:** NA

Notes: DOT - US Department of Transportation Regulations

**15. REGULATORY INFORMATION**

**TSCA Status** Product is exempt.  
**CERCLA Status** Epinephrine – Listed. The US Federal EPA waste listing for epinephrine does not include epinephrine salts. Disposal should be performed in accordance with all federal, state, and local regulatory requirements.  
**SARA 302 Status** Not listed  
**SARA 313 Status** Not listed  
**RCRA Status** Epinephrine – Listed. The US Federal EPA waste listing for epinephrine does not include epinephrine salts. Disposal should be performed in accordance with all federal, state, and local regulatory requirements.  
**PROP 65 (Calif.)** Not listed

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

**U.S. OSHA Classification** Possible Irritant  
 Target Organ Toxin

**15. REGULATORY INFORMATION: continued**

**GHS Classification\***      \*In circumstances where medicinal products are not exempt, the recommended GHS classification is as follows:

| <b>Hazard Class</b>     | Acute Oral Toxicity   | Eye Irritation   | Target Organ Toxicity   |
|-------------------------|-----------------------|--|---|
| <b>Hazard Category</b>  | Unclassified          | 2B   | 2   |
| <b>Symbol</b>           |                       |  |  |
| <b>Signal Word</b>      |                       | Warning  | Warning   |
| <b>Hazard Statement</b> | Causes eye irritation | May cause damage to the nervous system, cardiovascular system eyes, and respiratory system through prolonged or repeated exposure. |   |

**Prevention:** Do not breathe vapor or spray.

**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 Classifications\***

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

**Classification(s):**                      Toxic                      Irritant

**Symbol:**



**Indication of Danger**

T

Xi

**Risk Phrases:**

R24 – Toxic if swallowed  
 R25 – Toxic in contact with skin  
 R36/37/8 - Irritating to eyes, respiratory system and skin

**Safety Phrases:**

S23: Do not breathe vapor/spray  
 S24: Avoid contact with the skin  
 S25: Avoid contact with 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   |
| LD <sub>50</sub> | 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: Global Occupational Toxicology  
Date Prepared: September 15, 2005  
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