SAFETY DATA SHEET

Product Name: Epirubicin Hydrochloride Injection

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Manufacturer Name And Address	Hospira, Inc. 275 North Field Drive Lake Forest, Illinois 60045 USA	Hospira Australia Pty Ltd 1 Lexia Place Mulgrave VIC 3170 AUSTRALIA
Emergency Telephone #'s	CHEMTREC: North America: 800-424-9300; International 1-703-527-3887; Australia - 61-290372994; UK - 44-870-8200418	
Hospira, Inc., Non-Emergency	224 212-2000	
Product Name	Epirubicin Hydrochloride Injection, 10 mg/5 mL, 50 mg/25 mL, 150 mg/75 mL, and 200 mg/100 mL	
Synonyms	(8S-cis)-10-[(3-amino-2,3,6-trideoxy-a-L-arabino-hexopyranosyl)oxy]-7,8,9,10-tetrahydro6,8,11-trihydroxy-8-(hydroxyacetyl)-1-methoxy-5,12-naphthacenedione hydrochloride	

2. HAZARD(S) IDENTIFICATION

Emergency Overview

Epirubicin Hydrochloride Injection is a solution containing epirubicin hydrochloride, an antineoplastic anthracycline antibiotic similar to daunorubicin and doxorubicin. It is a cytotoxic agent, and in the workplace should be considered potentially irritating to eyes and skin, a potential occupational reproductive hazard, and a potential human carcinogen. Based on clinical use, possible target organs may include the bone marrow, cardiovascular system, gastrointestinal tract, and skin.

U.S. OSHA GHS Classification

Physical Hazards	**Hazard Class**	**Hazard Category**
	Not Classified	Not Classified

Health Hazards	**Hazard Class**	**Hazard Category**
	Toxic to Reproduction	2
	Carcinogenicity	2

Label Element(s)

Pictogram

Signal Word

Warning

Hazard Statement(s)

Suspected of damaging fertility or the unborn child
Suspected of causing cancer

Precautionary Statement(s)

Prevention

Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Wear protective gloves/protective clothing/eye protection/face protection
Do not breathe vapor or spray
Wash hands thoroughly after handling

Response

If exposed or concerned: Get medical advice/attention.

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. Get medical attention if you feel unwell.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient Name Epirubicin Hydrochloride
Chemical Formula $C_{27}H_{29}NO_{11}$ HCl

Component	Approximate Percent by Weight	CAS Number	RTECS Number
Epirubicin Hydrochloride	0.2	56390-09-1	QI9295750

Non-hazardous ingredients include Water for Injection. Hazardous ingredients present at less than 1% include: sodium chloride at 0.9%; hydrochloride acid is added to adjust the pH.

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 aqueous product.

Fire & Explosion Hazard None anticipated for this aqueous product.

Extinguishing Media As with any fire, use extinguishing media appropriate for primary cause of fire such as carbon dioxide, dry chemical extinguishing powder or foam.

Special Fire Fighting Procedures No special provisions required beyond normal firefighting 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 control procedures. Absorb liquid spill with suitable material and clean affected area with soap and water. Household bleach can be used to further clean the affected spill area. Dispose of spill materials according to the applicable federal, state, or local regulations.

7. HANDLING AND STORAGE

Handling Epirubicin hydrochloride is a cytotoxic agent. Appropriate procedures should be implemented during the handling and disposal of cytotoxic antineoplastics agents to minimize potential exposures. Several guidelines on handling cytotoxic antineoplastic agents have been published. There is no general agreement that all of the procedures recommended in the guidelines are necessary or appropriate. Consult your hygienist or safety professional for your site requirements.

Avoid ingestion, inhalation, skin contact, and eye contact. When handling the powder, precautions may include the use of a containment cabinet during the weighing, reconstitution and/or solubilization of this antineoplastic agent. The use of disposable gloves and respiratory protection is recommended. Proper disposal of contaminated vials, syringes, or other materials is required when working with this material.

7. HANDLING AND STORAGE: continued

Storage

No special storage is required for hazard control. However, employees should be trained on the proper storage procedures for antineoplastic agents. 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. Persons with known hypersensitivities to epirubicin hydrochloride, women who are pregnant, or women who want to become pregnant, should consult a health and/or safety professional prior to handling open containers of this material.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

	Exposure Limits			
Component	**OSHA-PEL**	**ACGIH-TLV**	**AIHA WEEL**	**Hospira EEL**
Epirubicin Hydrochloride	8-hr TWA: Not Established	8-hr TWA: Not Established	8-hr TWA: Not Established	8-hr TWA: Not Established

Notes: OSHA PEL: US Occupational Safety and Health Administration – Permissible Exposure Limit
ACGIH TLV: American Conference of Governmental Industrial Hygienists – Threshold Limit Value.
AIHA WEEL: Workplace Environmental Exposure Level
EEL: Employee Exposure Limit.
TWA: 8-hour Time Weighted Average.

Respiratory Protection

Respiratory protection is normally not needed during intended product use. However, if the generation of aerosols or vapors 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 (N99 or equivalent) is recommended under conditions where airborne aerosol or vapor concentrations are not expected to be excessive. For uncontrolled release events, or if exposure levels are not known, provide respirators that offer a high protection factor such as a powered air purifying respirator or supplied air. 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

When handling this material, disposable gloves should be worn at all times. Further, the use of double gloves is recommended. Disposable gloves made from nitrile, neoprene, polyurethane or natural latex generally have low permeability to this material. Persons known to be allergic to latex rubber should select a non-latex glove. Gloves should be changed regularly, and removed immediately after known contamination. Care should be taken to minimize inadvertent contamination when removing and/or disposing of gloves.

Eye Protection

As a minimum, the use of chemical safety goggles is recommended when handling this material.

Engineering Controls

If creation of aerosols is likely, local exhaust ventilation is recommended to minimize employee exposure. The use of an enclosure, such as an approved ventilated cabinet designed to minimize airborne exposures, is recommended when working with open containers of this material.

9. PHYSICAL/CHEMICAL PROPERTIES

Appearance/Physical State	A sterile, clear, red solution
Odor	Odorless
Odor Threshold	NA
pH	3.0
Melting point/Freezing Point	NA
Initial Boiling Point/Boiling Point Range	NA
Flash Point	NA
Evaporation Rate	NA
Flammability (solid, gas)	NA
Upper/Lower Flammability or Explosive Limits	NA
Vapor Pressure	NA
Vapor Density (Air =1)	NA
Relative Density	NA
Solubility	Soluble in water and in methyl alcohol; slightly soluble in dehydrated alcohol
Partition Coefficient: n-octanol/water	NA
Auto-ignition Temperature	NA
Decomposition Temperature	NA
Viscosity	NA

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 hydrogen chloride.
Hazardous Polymerization	Not anticipated to occur with this product.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity - Not determined for the product formulation. Information for the active ingredient is as follows:

Ingredient(s)	Percent	Test Type	Route of Administration	Value	Units	Species
Epirubicin Hydrochloride	100	LD50	Oral	1350	mg/kg	Rat
Epirubicin Hydrochloride	100	LD50	Oral	> 2000	mg/kg	Mouse
Epirubicin Hydrochloride	100	LD50	Intravenous	17	mg/kg	Rat
Epirubicin Hydrochloride	100	LD50	Intravenous	31.5	mg/kg	Mouse
Epirubicin Hydrochloride	100	LD50	Intravenous	2.25	mg/kg	Dog
Epirubicin Hydrochloride	100	LD50	Intraperitoneal	10.8	mg/kg	Rat

LD50 is the dosage producing 50% mortality.

11. TOXICOLOGICAL INFORMATION: continued

Occupational Exposure Potential	There are scientific studies that suggest that personnel (e.g. nurses, pharmacists, etc.) who prepare and administer parenteral antineoplastics (e.g. in hospitals) may be at some risk due to potential mutagenicity, teratogenicity, and/or carcinogenicity of these materials if workplace exposures are not properly controlled. The actual risk in the workplace is not known.
Signs and Symptoms	None anticipated from normal handling of this product. This product should be considered irritating to the skin, eyes, and respiratory tract. In clinical use, epirubicin hydrochloride is very irritating, sometimes producing thrombophlebitis and streaking of the skin over the vein used for injection. Other adverse effects reported during clinical use have included severe nausea and vomiting, stomatitis, and esophagitis (which may progress to ulceration), and bone marrow depression. More rarely, facial flushing, conjunctivitis, and lachrymation have been reported. Hair loss and changes in skin pigmentation may also occur. Prolonged or high-dose exposures have produced cardiotoxicity. Occasionally, hypersensitivity reactions have also been reported.
Aspiration Hazard	None anticipated from normal handling of this product.
Dermal Irritation/ Corrosion	None anticipated from normal handling of this product. However, inadvertent skin contact may produce irritation with redness.
Ocular Irritation/ Corrosion	None anticipated from normal handling of this product. However, inadvertent eye contact may produce irritation with redness, tearing, and discomfort.
Dermal or Respiratory Sensitization	None anticipated from normal handling of this product. Occasionally, hypersensitivity reactions have been reported during clinical use of this product.
Reproductive Effects	None anticipated from normal handling of this product. In fertility studies, male rats were given epirubicin daily for 9 weeks and mated with females rats given epirubicin daily for 2 weeks prior to mating and treated through Day 7 of gestation. No effects on mating behavior or fertility were noted at a dosage of 0.1 mg/kg/day, but male rats had atrophy of the testes and epididymis, and reduced spermatogenesis. An increased incidence of fetal growth retardation was noted at a dosage of 0.03 mg/kg/day. A dosage of 0.1 mg/kg/day caused embryolethality. At a dosage of 0.3 mg/kg/day to both males and females, no pregnancies occurred. Multiple daily doses of epirubicin to rabbits and dogs also resulted in the atrophy of male reproductive organs. Single intravenous dosages of 20.5 and 12 mg/kg of epirubicin caused testicular atrophy in mice and rats, respectively. A single dosage of 16.7 mg/kg epirubicin produced uterine atrophy in rats.
Mutagenicity	In vitro, epirubicin was positive for mutagenicity in the Ames test (in the presence or absence of metabolic activation), and in the HGPRT assay in V79 Chinese hamster lung fibroblasts in the absence, but not in the presence of metabolic activation. Similarly, in vitro, epirubicin was clastogenic, producing chromosome aberrations in human lymphocytes, both in the presence and absence of metabolic activation. Epirubicin was also clastogenic in vivo, producing chromosome aberrations in a mouse bone marrow assay.
Carcinogenicity	The carcinogenic potential of epirubicin has not been fully evaluated in long-term animal studies. However, a single intravenous administration of epirubicin to female rats at a dosage of 3.6 mg/kg approximately doubled the incidence of mammary tumors reported at 1 year. Similarly, intravenous administration of epirubicin to rats at a dosage of 0.5 mg/kg (once every 3 weeks for ten doses) increased the incidence of subcutaneous fibromas in males over an 18-month observation period. In addition, subcutaneous administration of 8 doses of epirubicin to newborn rats at dosages of 0.75 or 1.0 mg/kg/day increased the incidence of animals with tumors noted over a 2 year time period. Finally, the occurrence of secondary acute myelogenous leukemia, with or without a preleukemic phase, has been reported in patients treated with anthracyclines.

11. TOXICOLOGICAL INFORMATION: continued

Carcinogen Lists	**IARC:** Not listed	**NTP:** Not listed	**OSHA:** Not listed
Specific Target Organ Toxicity – Single Exposure	NA		
Specific Target Organ Toxicity – Repeat Exposure	Based on clinical use, possible target organs may include the bone marrow, cardiovascular system, gastrointestinal tract, and skin.		

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.

Notes:

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
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

US TSCA Status	Exempt.
US CERCLA Status	Not listed
US SARA 302 Status	Not listed
US SARA 313 Status	Not listed
US RCRA Status	Not listed
US 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

GHS/CLP 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.

Hazard Class	Hazard Category	Pictogram	Signal Word	Hazard Statement
NA	NA	NA	NA	NA

Prevention

Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Wear protective gloves/protective clothing/eye protection/face protection
Do not breathe vapor or spray
Wash hands thoroughly after handling

Response

If exposed or concerned: Get medical advice/attention. Get medical attention if you feel unwell.

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.

EU Classification*

*Medicinal products are exempt from the requirements of the EU Dangerous Preparations Directive.

Classification(s)	NA
Symbol	NA
Indication of Danger	NA
Risk Phrases	NA
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_{50}	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
STOT - SE	Specific Target Organ Toxicity – Single Exposure
STOT - RE	Specific Target Organ Toxicity – Repeated Exposure
TSCA	Toxic Substance Control Act
TWA	8-hour Time Weighted Average

MSDS Coordinator:	Hospira GEHS
Date Prepared:	October 18, 2012
Date Revised:	June 02, 2014

Disclaimer:

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