MATERIAL SAFETY DATA SHEET

Product Name: Aminophylline Injection, USP

1. CHEMICAL PRODUCT AND COMPANY INFORMATION

Manufacturer Name And Address	Hospira Inc. 275 North Field Drive Lake Forest, Illinois USA 60045
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 Synonyms	Aminophylline Injection, USP 1H-Purine-2, 6-dione, 3,7-dihydro-1,3-dimethyl-, compound with 1,2-ethanediamine (2:1).

2. COMPOSITION/INFORMATION ON INGREDIENTS

Active Ingredient Name	Aminophylline Dihydrate
Chemical Formula	$C_{16}H_{24}N_{10}O_4 \bullet 2(H_2O)$
Preparation	Non-hazardous ingredients include Water for Injection. Ethylenediamine is added to adjust the pH.

Component	Approximate Percent by Weight	CAS Number	RTECS Number
Aminophylline Dihydrate	2.5	5897-66-5	XH5602000

3. HAZARD INFORMATION

Carcinogen List

Substance	IARC	NTP	OSHA
Aminophylline Dihydrate	Not Listed	Not Listed	Not Listed

Emergency Overview	Aminophylline Injection, USP is a solution that contains aminophylline dihydrate, a 2:1 complex of theophylline and ethylenediamine that readily liberates theophylline in the body. Clinically, it is used in the management of acute severe bronchospasm. In the workplace, toxic by ingestion and a potential respiratory and eye irritant. Based on clinical use, potential target organs include the eyes, central nervous system, respiratory system, and cardiovascular system.
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 occupational exposures. May be irritating to the eyes and respiratory tract. Aminophylline is a drug that relaxes smooth muscle in the bronchial airways and blood vessels in the lungs. It also is a coronary vasodilator, cardiac stimulant and skeletal muscle stimulant. Aminophylline releases theophylline once in the body. Theophylline is metabolized in the liver to caffeine and other metabolites. In clinical use, adverse effects may include nausea and restlessness, vomiting, dizziness, increased heart rate and palpitations, increased respiration and

albuminuria, lowered blood pressure, increased respiration, and increased urine output and rashes.

Medical Conditions Aggravated by Exposure	Pre-existing hypersensitivity to theophylline or ethylenediamine; concurrent xanthine therapy. Pre-existing severe cardiac disease, severe hypoxia, hypertension, arryhythmias, congestive heart failure and liver injury. Also gastrointestinal and urinary 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 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.
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 procedures. 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. Protect from light by retaining in carton until contents have been used.
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	Protect from freezing, light, and extreme heat.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

	Exposure limits				
Component	**Type**	**mg/m3**	**ppm**	**µg/m3**	**Note**
Aminophylline Dihydrate	Hospira EEL	N/A	N/A	1000	8hr TWA

Respiratory protection

Respiratory protection is normally not needed during intended product use. However, if the generation of 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 aerosol 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

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

Appearance/Physical State	Liquid
Color	Clear
Odor	NA
Odor Threshold:	NA
pH:	8.8 (8.6 to 9.0)
Melting point/Freezing point:	NA
Initial Boiling Point/Boiling Point Range:	NA
Evaporation Rate:	NA
Flammability (solid, gas):	NA
Upper/Lower Flammability or Explosive Limits:	NA
Vapor Pressure:	NA
Vapor Density:	NA
Specific Gravity:	NA
Solubility:	NA
Partition coefficient: n-octanol/water:	NA
Auto-ignition temperature:	NA
Decomposition temperature:	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 Solutions of aminophylline are alkaline and if the pH falls below 8, crystals of theophylline may form. Drugs known to be unstable in alkaline solutions, or that would lower the pH below the critical value, should not be mixed with aminophylline.

Hazardous decomposition products 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).

Hazardous Polymerization Not anticipated to occur with this product.

11. TOXICOLOGICAL INFORMATION

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

Ingredient(s)	Percent	Test Type	Route of Administration	Value	Units	Species
Aminophylline Dihydrate	100	LD50	Oral	250	mg/kg	Mouse
Aminophylline Dihydrate	100	LD50	Intravenous	150	mg/kg	Mouse
Aminophylline	100	LD50	Oral	243 150 184	mg/kg mg/kg mg/kg	Rat Mouse Guinea Pig
Aminophylline	100	LD50	Intravenous	104 125 150 143	mg/kg mg/kg mg/kg mg/kg	Rat Mouse Rabbit Guinea Pig

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 with redness and discomfort.

Dermal or Respiratory Sensitization None anticipated from normal handling of this product.

Reproductive Effects In a 14 week continuous breeding study, theophylline, administered to mating pairs of B6C3F1 mice at oral doses of 120, 270 and 500 mg/kg, impaired fertility at the high dose and decreased the proportion of pups born alive at the mid and high dose. In 13 week toxicity studies, theophylline was administered to F344 rats and B6C3F1 mice at oral doses of 40 - 300 mg/kg. At the high dose, systemic toxicity was observed in both species including decreases in testicular weight. Theophylline was not teratogenic in CD-1 mice at oral dosages up to 400 mg/kg or in CD-1 rats at oral dosages up to 260 mg/kg. At a dosage of 220 mg/kg, embryotoxicity was observed in rats in the absence of maternal toxicity.

Mutagenicity	Theophylline has been studied in Ames salmonella, in vivo and in vitro cytogenetics, micronucleus and Chinese hamster ovary test systems and has not been shown to be genotoxic.
Carcinogenicity	The carcinogenic potential of aminophylline has not been fully evaluated.
Target Organ Effects	Based on clinical use, potential target organs include the eyes, central nervous system, respiratory system, and cardiovascular system.

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

DOT STATUS	Not regulated
IMDG STATUS:	Not regulated
ICAO/IATA STATUS:	Not regulated

15. REGULATORY INFORMATION

USA Regulations

Substance	TSCA Status	CERCLA Status	SARA 302 Status	SARA 313 Status	PROP 65 Status
Aminophylline Dihydrate	Exempt	Not Listed	Not Listed	Not Listed	Not Listed

RCRA Status Not Listed

U.S. OSHA Classification Target Organ Toxin
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.

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 Aminophylline Dihydrate

.

Classification(s):	Not Applicable
Symbol:	Not Applicable
Indication of Danger:	Not Applicable
Risk Phrases:	Not Applicable
Safety Phrases:	S23 - Do not breathe vapor. S24 - Avoid contact with 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
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: Fri. 06/03/2011
Obsolete Date: Tue. 10/21/2008

Disclaimer:
The information and recommendations contained herein are based upon tests believed to be reliable. However, Hospira does not guarantee their accuracy or completeness NOR SHALL ANY OF THIS INFORMATION CONSTITUTE A WARRANTY, WHETHER EXPRESSED OR IMPLIED, AS TO THE SAFETY OF THE GOODS, THE MERCHANTABILITY OF THE GOODS, OR THE FITNESS OF THE GOODS FOR A PARTICULAR PURPOSE. Adjustment to conform to actual conditions of usage may be required. Hospira assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits, arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied.