SAFETY DATA SHEET

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND THE COMPANY/UNDERTAKING

Product Identifier

Material Name: Gemcitabine (gemcitabine hydrochloride) for Injection (Hospira, Inc.)

Trade Name: Not applicable

Synonyms: Gemcitabine for Injection, USP (Lyophilized)

Chemical Family: Mixture

Relevant Identified Uses of the Substance or Mixture and Uses Advised Against

Intended Use: Pharmaceutical product used as Antineoplastic

Details of the Supplier of the Safety Data Sheet

Hospira, A Pfizer Company
275 North Field Drive
Lake Forest, Illinois 60045
1-800-879-3477

Hospira UK Limited
Horizon
Honey Lane
Hurley
Maidenhead, SL6 6RJ
United Kingdom

Emergency telephone number:
CHEMTREC (24 hours): 1-800-424-9300

Emergency telephone number:
International CHEMTREC (24 hours): +1-703-527-3887

Contact E-Mail: pfizer-MSDS@pfizer.com

2. HAZARDS IDENTIFICATION

Classification of the Substance or Mixture

GHS - Classification

Acute Oral Toxicity: Category 4
Skin Corrosion/Irritation: Category 2
Serious Eye Damage/Eye Irritation: Category 2B
Germ Cell Mutagenicity: Category 1B
Reproductive Toxicity: Category 1B

US OSHA Specific - Classification

Physical Hazard: Combustible Dust

Label Elements

Signal Word: Danger
Hazard Statements:
H302 - Harmful if swallowed
H315 - Causes skin irritation
H319 - Causes serious eye irritation
H360FD - May damage fertility. May damage the unborn child.
H340 - May cause genetic defects
May form combustible dust concentrations in air
Precautionary Statements:

P201 - Obtain special instructions before use
P202 - Do not handle until all safety precautions have been read and understood
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P264 - Wash hands thoroughly after handling
P308 + P313 - IF exposed or concerned: Get medical attention/advice
P302+ P352 - IF ON SKIN: Wash with plenty of soap and water
P332 + P313 - If skin irritation occurs: Get medical advice/attention
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P405 - Store locked up
P501 - Dispose of contents/container in accordance with all local and national regulations

Other Hazards

An Occupational Exposure Value has been established for one or more of the ingredients (see Section 8).

Note:

This document has been prepared in accordance with standards for workplace safety, which requires the inclusion of all known hazards of the product or its ingredients regardless of the potential risk. The precautionary statements and warning included may not apply in all cases. Your needs may vary depending upon the potential for exposure in your workplace.

3. COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS Number</th>
<th>EU EINECS/ELINCS List</th>
<th>GHS Classification</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gemcitabine hydrochloride</td>
<td>122111-03-9</td>
<td>Not Listed</td>
<td>Acute Tox. 2 (H302) Eye Irrit. 2B (H319)</td>
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<td></td>
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<td>Skin Irrit. 2 (H315) Repr. 1B (H360FD)</td>
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<td></td>
<td>Muta. 1B (H340)</td>
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<tr>
<td>Sodium hydroxide</td>
<td>1310-73-2</td>
<td>215-185-5</td>
<td>Skin Corr. 1A (H314)</td>
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<tr>
<td>Hydrochloric Acid</td>
<td>7647-01-0</td>
<td>231-595-7</td>
<td>STOT SE 3 (H335) Skin Corr. 1A (H314)</td>
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<td></td>
<td></td>
<td></td>
<td>Press. Gas</td>
<td></td>
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<tr>
<td></td>
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<td>Acute Tox. 3 (H331)</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS Number</th>
<th>EU EINECS/ELINCS List</th>
<th>GHS Classification</th>
<th>%</th>
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<tr>
<td>Mannitol</td>
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<td>200-711-8</td>
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<tr>
<td>Sodium acetate trihydrate</td>
<td>6131-90-4</td>
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<td>Not Listed</td>
<td>*</td>
</tr>
</tbody>
</table>
SAFETY DATA SHEET

Material Name: Gemcitabine (gemcitabine hydrochloride) for Injection (Hospira, Inc.)
Revision date: 15-Nov-2016
Page 3 of 11
Version: 1.0

Additional Information:
* Proprietary
** to adjust pH
Ingredient(s) indicated as hazardous have been assessed under standards for workplace safety. In accordance with 29 CFR 1910.1200, the exact percentage composition of this mixture has been withheld as a trade secret.

For the full text of the CLP/GHS abbreviations mentioned in this Section, see Section 16

4. FIRST AID MEASURES

Description of First Aid Measures
Eye Contact: Flush with water while holding eyelids open for at least 15 minutes. Seek medical attention immediately.
Skin Contact: Remove contaminated clothing. Flush area with large amounts of water. Use soap. Seek medical attention.
Ingestion: Never give anything by mouth to an unconscious person. Wash out mouth with water. Do not induce vomiting unless directed by medical personnel. Seek medical attention immediately.
Inhalation: Remove to fresh air and keep patient at rest. Seek medical attention immediately.

Most Important Symptoms and Effects, Both Acute and Delayed
Symptoms and Effects of Exposure: For information on potential signs and symptoms of exposure, See Section 2 - Hazards Identification and/or Section 11 - Toxicological Information.
Medical Conditions Aggravated by Exposure: None known

Indication of the Immediate Medical Attention and Special Treatment Needed
Notes to Physician: None

5. FIRE FIGHTING MEASURES

Extinguishing Media: Extinguish fires with CO2, extinguishing powder, foam, or water.

Special Hazards Arising from the Substance or Mixture
Hazardous Combustion Products: Formation of toxic gases is possible during heating or fire.
Fire / Explosion Hazards: Fine particles (such as dust and mists) may fuel fires/explosions.

Advice for Fire-Fighters
During all fire fighting activities, wear appropriate protective equipment, including self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures
Personnel involved in clean-up should wear appropriate personal protective equipment (see Section 8). Minimize exposure.

Environmental Precautions
Place waste in an appropriately labeled, sealed container for disposal. Care should be taken to avoid environmental release.

Methods and Material for Containment and Cleaning Up

PZ03241
Measures for Cleaning / Collecting:
Contain the source of spill if it is safe to do so. Collect spilled material by a method that controls dust generation. A damp cloth or a filtered vacuum should be used to clean spills of dry solids. Clean spill area thoroughly.

Additional Consideration for Large Spills:
Non-essential personnel should be evacuated from affected area. Report emergency situations immediately. Clean up operations should only be undertaken by trained personnel.

7. HANDLING AND STORAGE

Precautions for Safe Handling
Restrict access to work area. Minimize dust generation and accumulation. Avoid breathing dust. Avoid contact with eyes, skin and clothing. When handling, use appropriate personal protective equipment (see Section 8). Wash thoroughly after handling. Releases to the environment should be avoided. Review and implement appropriate technical and procedural waste water and waste disposal measures to prevent occupational exposure or environmental releases. Potential points of process emissions of this material to the atmosphere should be controlled with dust collectors, HEPA filtration systems or other equivalent controls.

Conditions for Safe Storage, Including any Incompatibilities
Storage Conditions: Store as directed by product packaging.
Specific end use(s): Pharmaceutical drug product Antineoplastic

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control Parameters  
Refer to available public information for specific member state Occupational Exposure Limits.

Sodium hydroxide

ACGIH Ceiling Threshold Limit: 2 mg/m³
Australia PEAK 2 mg/m³
Austria OEL - MAKs 2 mg/m³
Bulgaria OEL - TWA 2.0 mg/m³
Czech Republic OEL - TWA 1 mg/m³
Estonia OEL - TWA 1 mg/m³
France OEL - TWA 2 mg/m³
Greece OEL - TWA 2 mg/m³
Hungary OEL - TWA 2 mg/m³
Japan - OELs - Ceilings 2 mg/m³
Latvia OEL - TWA 0.5 mg/m³
OSHA - Final PELS - TWAs: 2 mg/m³
Poland OEL - TWA 0.5 mg/m³
Slovakia OEL - TWA 2 mg/m³
Slovenia OEL - TWA 2 mg/m³
Sweden OEL - TWAs 1 mg/m³
Switzerland OEL -TWAs 2 mg/m³

Hydrochloric Acid

ACGIH Ceiling Threshold Limit: 2 ppm
Australia PEAK 5 ppm
7.5 mg/m³
Austria OEL - MAKs 5 ppm
8 mg/m³
Belgium OEL - TWA 5 ppm
8 mg/m³
Bulgaria OEL - TWA 5 ppm
8.0 mg/m³
### 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

<table>
<thead>
<tr>
<th>Country OEL - TWA</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
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<td>8 mg/m³</td>
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<td>Germany - TRGS 900 - TWAs</td>
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<td>8 mg/m³</td>
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<td>7.6 mg/m³</td>
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<td>Switzerland OEL -TWAs</td>
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<td>3.0 mg/m³</td>
</tr>
<tr>
<td>Vietnam OEL - TWAs</td>
<td>5 mg/m³</td>
</tr>
</tbody>
</table>

**Gemcitabine hydrochloride**

**Pfizer Occupational Exposure Band (OEB):**

OEB 5 - Skin (control exposure to <1ug/m³, provide additional precautions to protect from skin contact)

**Exposure Controls**

**Engineering Controls:**

Engineering controls should be used as the primary means to control exposures. General room ventilation is adequate unless the process generates dust, mist or fumes. Keep airborne contamination levels below the exposure limits listed above in this section. It is recommended that all operations be fully enclosed and no air recirculated.
8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Personal Protective Equipment:
Refer to applicable national standards and regulations in the selection and use of personal protective equipment (PPE). Contact your safety and health professional or safety equipment supplier for assistance in selecting the correct protective clothing/equipment based on an assessment of the workplace conditions, other chemicals used or present in the workplace and specific operational processes.

Hands:
Impervious disposable gloves (e.g. Nitrile, etc.) (double recommended) if skin contact with drug product is possible and for bulk processing operations. (Protective gloves must meet the standards in accordance with EN374, ASTM F1001 or international equivalent.)

Eyes:
Wear safety glasses or goggles if eye contact is possible. (Eye protection must meet the standards in accordance with EN166, ANSI Z87.1 or international equivalent.)

Skin:
Wear impervious protective clothing to prevent skin contact – consider use of disposable clothing where appropriate. (Protective clothing must meet the standards in accordance with EN13982, ANSI 103 or international equivalent.)

Respiratory protection:
Under normal conditions of use, if the applicable Occupational Exposure Limit (OEL) is exceeded, wear an appropriate respirator with a protection factor sufficient to control exposures to below the OEL (e.g. particulate respirator with a full mask, P3 filter). (Respirators must meet the standards in accordance with EN136, EN143, ASTM F2704-10 or international equivalent.)

9. PHYSICAL AND CHEMICAL PROPERTIES

- Physical State: Lyophilized powder
- Odor: No data available.
- Molecular Formula: Mixture
- Color: White to off-white
- Odor Threshold: No data available.
- Molecular Weight: Mixture

- Solvent Solubility: No data available
- Water solubility: 15.3 g/L (gemcitabine)
- Water Solubility: No data available
- pH: No data available.
- Melting/Freezing Point (°C): No data available
- Boiling Point (°C): No data available
- Partition Coefficient: (Method, pH, Endpoint, Value)
- Mannitol
  - No data available
- Hydrochloric Acid
  - No data available
- Sodium hydroxide
  - No data available
- Gemcitabine hydrochloride
  - No data available
- Sodium acetate trihydrate
  - No data available
- Decomposition Temperature (°C): No data available
- Evaporation Rate (Gram/s): No data available
- Vapor Pressure (kPa): No data available
- Vapor Density (g/ml): No data available
- Relative Density: No data available
- Viscosity: No data available

Flammability:
- Autoignition Temperature (Solid) (°C): No data available
- Flammability (Solids): No data available
- Flash Point (Liquid) (°C): No data available
Upper Explosive Limits (Liquid) (% by Vol.): No data available
Lower Explosive Limits (Liquid) (% by Vol.): No data available

10. STABILITY AND REACTIVITY

Reactivity: No data available
Chemical Stability: Stable under normal conditions of use.
Possibility of Hazardous Reactions
- Oxidizing Properties: No data available
- Conditions to Avoid: Fine particles (such as dust and mists) may fuel fires/explosions.
- Incompatible Materials: As a precautionary measure, keep away from strong oxidizers
- Hazardous Decomposition Products: No data available

11. TOXICOLOGICAL INFORMATION

Information on Toxicological Effects
General Information: The information included in this section describes the potential hazards of the individual ingredients.
Short Term: May be absorbed through the skin and cause systemic effects.
Long Term: Repeat-dose studies in animals have shown a potential to cause adverse effects on reproductive system and blood and blood forming organs. Animal studies have shown a potential to cause adverse effects on the fetus.
Known Clinical Effects: Adverse effects associated with therapeutic use include decreased blood cell count, nausea, vomiting, swelling, skin rash, liver enzyme changes, flu-like syndrome.

Acute Toxicity: (Species, Route, End Point, Dose)

Mannitol
- Rat Oral LD50 13500 mg/kg
- Mouse Oral LD50 22 g/kg

Sodium hydroxide
- Mouse IP LD50 40 mg/kg

Gemcitabine hydrochloride
- Mouse Oral Minimum Lethal Dose 333 mg/kg
- Rat Oral LD50 > 500mg/kg
- Rabbit Dermal LD50 > 1000mg/kg

Acute Toxicity Comments: A greater than symbol (>) indicates that the toxicity endpoint being tested was not achievable at the highest dose used in the test.

Irritation / Sensitization: (Study Type, Species, Severity)

Sodium hydroxide
- Eye Irritation Rabbit Severe
- Skin Irritation Rabbit Severe

Gemcitabine hydrochloride
- Skin Irritation Rabbit Irritant
- Eye Irritation Rabbit Irritant
11. TOXICOLOGICAL INFORMATION

Repeated Dose Toxicity: (Duration, Species, Route, Dose, End Point, Target Organ)

**Gemcitabine hydrochloride**
- 6 Month(s)  Dog  No route specified  0.04 mg/kg/day  NOAEL  Blood, Erythroid cells, Lymphoid tissue, Immune system
- 6 Month(s)  Mouse  No route specified  0.006 mg/kg/day  LOAEL  Erythroid cells, Male reproductive system, Spleen

Reproduction & Developmental Toxicity: (Study Type, Species, Route, Dose, End Point, Effect(s))

**Gemcitabine hydrochloride**
- Reproductive & Fertility  Mouse  Intraperitoneal  0.05 mg/kg/day  NOAEL  Fertility
- Fertility and Embryonic Development  Mouse  Intravenous  0.25 mg/kg/day  LOAEL  Fetotoxicity, Embryotoxicity, Maternal Toxicity

Genetic Toxicity: (Study Type, Cell Type/Organism, Result)

**Gemcitabine hydrochloride**
- In Vivo Micronucleus  Mouse  Positive
- In Vitro Mammalian Cell Mutagenicity  Mouse Lymphoma  Positive
- Bacterial Mutagenicity (Ames)  *Salmonella* , *E. coli*  Negative
- In Vivo Sister Chromatid Exchange  Negative
- In Vitro Chromosome Aberration  Negative

**Carcinogen Status:** None of the components of this formulation are listed as a carcinogen by IARC, NTP or OSHA.

**Hydrochloric Acid**
- IARC: Group 3 (Not Classifiable)

12. ECOLOGICAL INFORMATION

Environmental Overview: Environmental properties have not been thoroughly investigated. Releases to the environment should be avoided.

**Toxicity:**

**Aquatic Toxicity:** (Species, Method, End Point, Duration, Result)

**Gemcitabine hydrochloride**
- *Oncorhynchus mykiss* (Rainbow Trout)  LC50  96 Hours  > 1043 mg/L
- *Pimephales promelas* (Fathead Minnow)  LC50  96 Hours  > 1014 mg/L
- *Daphnia Magna* (Water Flea)  EC50  48 Hours  > 999 mg/L
- *Selenastrum capricornutum* (Green Alga)  EC50  5.4 mg/L

**Bacterial Inhibition:** (Inoculum, Method, End Point, Result)

**Gemcitabine hydrochloride**
- *Nostoc sp.* (Freshwater Cyanobacteria)  MIC  800 mg/L
- *Aspergillus niger* (Fungus)  MIC  > 1000 mg/L

**Persistence and Degradability:** No data available
13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods:
Dispose of waste in accordance with all applicable laws and regulations. Member State specific and Community specific provisions must be considered. Considering the relevant known environmental and human health hazards of the material, review and implement appropriate technical and procedural waste water and waste disposal measures to prevent occupational exposure and environmental release. It is recommended that waste minimization be practiced. The best available technology should be utilized to prevent environmental releases. This may include destructive techniques for waste and wastewater.

14. TRANSPORT INFORMATION

The following refers to all modes of transportation unless specified below.

Not regulated for transport under USDOT, EUADR, IATA, or IMDG regulations.

15. REGULATORY INFORMATION

Safety, Health and Environmental Regulations/Legislation Specific for the Substance or Mixture

Gemcitabine hydrochloride
- CERCLA/SARA 313 Emission reporting: Not Listed
- California Proposition 65: Not Listed
- EU EINECS/ELINCS List: Not Listed

Sodium hydroxide
- CERCLA/SARA 313 Emission reporting: Not Listed
- CERCLA/SARA Hazardous Substances and their Reportable Quantities:
  - California Proposition 65: Not Listed
  - Inventory - United States TSCA - Sect. 8(b): Present
  - Australia (AICS): Present
- Standard for the Uniform Scheduling for Drugs and Poisons:
  - Schedule 5
- EU EINECS/ELINCS List: 215-185-5

Hydrochloric Acid
15. REGULATORY INFORMATION

CERCLA/SARA 313 Emission reporting | 1.0 %
CERCLA/SARA Hazardous Substances and their Reportable Quantities: | 5000 lb
CERCLA/SARA - Section 302 Extremely Hazardous TPQs: | 2270 kg
CERCLA/SARA - Section 302 Extremely Hazardous Substances EPCRA RQs: | 5000 lb
California Proposition 65: | Not Listed
Inventory - United States TSCA - Sect. 8(b): | Present
Australia (AICS): | Present
Standard for the Uniform Scheduling for Drugs and Poisons: | Schedule 5
EU EINECS/ELINCS List: | 231-595-7

Mannitol
CERCLA/SARA 313 Emission reporting | Not Listed
California Proposition 65 | Not Listed
Inventory - United States TSCA - Sect. 8(b): | Present
Australia (AICS): | Present
REACH - Annex IV - Exemptions from the obligations of Register: | Present
EU EINECS/ELINCS List: | 200-711-8

Sodium acetate trihydrate
CERCLA/SARA 313 Emission reporting | Not Listed
California Proposition 65 | Not Listed
Australia (AICS): | Present
EU EINECS/ELINCS List | Not Listed

16. OTHER INFORMATION

Text of CLP/GHS Classification abbreviations mentioned in Section 3
Acute toxicity, oral-Cat.4; Skin corrosion/irritation-Cat.2; H315 - Causes skin irritation
Germ cell mutagenicity-Cat.1B; H340 - May cause genetic defects
Reproductive toxicity-Cat.1B; H360FD - May damage fertility. May damage the unborn child.
Serious eye damage/eye irritation-Cat. 2B; H319 - Causes serious eye irritation
Skin corrosion/irritation-Cat.1A; H314 - Causes severe skin burns and eye damage
Specific target organ toxicity, single exposure; Respiratory tract irritation-Cat.3; H335 - May cause respiratory irritation
Acute toxicity, inhalation-Cat.3; H331 - Toxic if inhaled

Data Sources: Publicly available toxicity information. Safety data sheets for individual ingredients.
Reasons for Revision: New data sheet.
Revision date: 15-Nov-2016

Pfizer Inc believes that the information contained in this Material Safety Data Sheet is accurate, and while it is provided in good faith, it is without warranty of any kind, expressed or implied. If data for a hazard are not included in this document there is no known information at this time.
End of Safety Data Sheet