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Section 1 - Identification

- (a) **Product Identifier:** Cyclophosphamide Injection
- (b) **Product Code:** 70860-218
- Common/Trade Name:** Not Established
- Chemical Name:** 2-[bis(2-chloroethyl)amino]tetrahydro-2H-1,3,2-oxazaphosphorine 2-oxide monohydrate
- Chemical Family:** Antineoplastic Agent
- (c) **Product Use:** Pharmaceutical, Injectable
- Product Type:** Regulated Prescription Drug
- Container Information:** Glass Vial
- (d) **Distributor:** Athenex Pharmaceutical Division, 10 N. Martingale Road, Suite 230, Schaumburg, IL 60173, 847-886-9515
- (e) **Emergency Telephone:** 855-273-0154


Section 2 - Hazards Identification


- (a) **GHS Classification of substance or mixture:**


Acute Oral Toxicity	Category 4
Skin Corrosion/Irritation	Category 2
Serious Eye Damage/Eye Irritation	Category 1
Skin Sensitization	Category 1
Germ Cell Mutagenicity	Category 1A
Carcinogenicity	Category 1A
Reproductive Toxicity	Category 1A
Effects on or via lactation	Effects on or via Lactation
Specific Target Organ Toxicity (Repeated Exposure)	Category 1
Ozone	Not Applicable

- (b) **Signal Word, Hazard statement(s), Symbol(s), and/or Precautionary statement(s):**

GHS Signal Word: Warning

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GHS Hazard Statement:	<p>H302 - Harmful if swallowed</p> <p>H315 - Causes skin irritation</p> <p>H317 - May cause an allergic skin reaction</p> <p>H318 - Causes serious eye damage</p> <p>H340 - May cause genetic defects</p> <p>H350 - May cause cancer</p> <p>H360 - May damage fertility or the unborn child</p> <p>H362 - May cause harm to breast-fed children</p> <p>H372 - Causes damage to organs through prolonged or repeated exposure</p>
GHS Symbols:	

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GHS Precautionary Statements:

P301+ P310 - IF SWALLOWED: Immediately call a POISON CENTRE or doctor/physician

P332 + P313 - If skin irritation occurs: Get medical advice/attention

P362 - Take off contaminated clothing and wash before reuse

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

P310 - Immediately call a POISON CENTRE or doctor/physician

P261 - Avoid breathing dust/fume/gas/mist/vapors/spray

P272 - Contaminated work clothing should not be allowed out of the workplace

P280 - Wear protective gloves/protective clothing/eye protection/face protection

P302+ P352 - IF ON SKIN: Wash with plenty of soap and water

P333 + P313 - If skin irritation or rash occurs: Get medical advice/attention

P321 - Specific treatment (see supplemental first aid instructions on this label)

P363 - Wash contaminated clothing before reuse

P263 - Avoid contact during pregnancy/while nursing

P260 - Do not breathe dust/fume/gas/mist/vapors/spray

P314 - Get medical attention/advice if you feel unwell

P201 - Obtain special instructions before use

P202 - Do not handle until all safety precautions have been read and understood

P281 - Use personal protective equipment as required

P308 + P313 - IF exposed or concerned: Get medical attention/advice

P405 - Store locked up


P264 - Wash face, hands and any exposed skin thoroughly after handling

P270 - Do not eat, drink or smoke when using this product

P301+ P312 - IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell

P330 - Rinse mouth

P501 - Dispose of contents/container to an approved waste disposal plant

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Other Hazards	<p>Potential Acute Health Effects: May cause eye, skin and respiratory tract irritation. Individuals sensitive to this chemical or other materials in its chemical class may develop allergic reactions. This compound can cross the placenta in pregnant women. Secreted in human breast milk.</p> <p>Adverse effects: The most common adverse effects reported with clinical use were diarrhea, nausea, rash, and vomiting. Effects on blood and blood-forming organs have also occurred.</p>
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(d) **Unknown Acute Toxicity** N/A

Section 3 – Composition / Information on Ingredients

Chemical Name	Common Name / Synonym	% Composition or other measure	CAS No.	Impurities / Stabilizing Additives
Cyclophosphamide Monohydrate	Cyclophosphamide	200 mg/mL	6055-19-2	N/A
Dehydrated Alcohol	Dehydrated Alcohol	620 mg	64175	N/A
Polyethylene glycol 400	Polyethylene glycol 400	34 mg	25322683	N/A
Propylene glycol	Propylene glycol	34 mg	57556	N/A
Monothioglycerol	Monothioglycerol	0.138 mg	96275	N/A
Nitrogen	Nitrogen	N/A	7727-37-9	N/A

Section 4 – First Aid Measures

General	Treat symptomatically and supportively
Eye Exposure:	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.
Skin Exposure:	In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Get medical attention

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- Ingestion:** Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.
- Injection:** In cases of accidental injection, wash and disinfect area, seek emergency medical attention.
- Inhalation:** If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
- Notes to Physician:** May be carcinogenic. See patient package insert in shipping carton for complete information
Treat symptomatically. See patient package insert in shipping carton for complete information

Section 5 – Fire-fighting Measures


- (a) **Extinguishing Media** Use extinguishing media suitable for surrounding material
- (b) **Hazardous Combustion Products:** No information available
- (c) **Special Protective Equipment / Precautions:** Fire fighters should wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear.

Section 6 - Accidental Release Measures

- Spill:** If emergency personnel are unavailable, contain spilled material. Absorb with vacuum cleaner approved for carcinogenic substances.
Place spilled material in an appropriate container for disposal. Avoid production of dust. Clean contaminated surface thoroughly.
- Release to Air:** Not available.
- Release to Water:** Do not allow material to contaminate ground water system.

Section 7 - Handling and Storage

- General Handling:** Do not ingest. Avoid skin contact. Avoid eye contact. Wash thoroughly after handling.
- Incompatibilities:** No special restrictions on storage with other products.
- Storage Conditions:** Store the vials refrigerated at 2°C to 8°C (36°F to 46°F).

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Section 8 - Exposure Controls / Personal Protection

(a) Exposure Limits

Compound	Issuer	Type	Exposure Limit
Cyclophosphamide	OSHA	PEL	NE
	ACGIH	TLV	NE
	AIHA	WEEL	

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

(b) Engineering Controls


Provide general or local exhaust ventilation. Open handling must be limited.

(c) Individual Protection Measures

Respiratory Protection:	No personal respiratory protective equipment normally required.
Eye Protection:	Goggles, face shield, or other full-face protection if potential exists for direct exposure to dust.
Skin Protection:	Latex gloves. Nitrile rubber. possible and for bulk processing operations.
Other Protective Equipment:	Disposable close-front gown or coveralls.
Additional Exposure Precautions:	Do not allow material to contaminate ground water system. and before eating, drinking, and/or smoking. Routinely wash work clothing and protective

Section 9 - Physical and Chemical Properties

(a) Appearance	colorless solution
(b) Odor	No information available
(c) Odor Threshold	No information available
(d) pH	3-6.5

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(e) Melting Point:	49° - 53° C
(f) Initial Boiling Point:	No information available
(g) Flash Point	No information available
(h) Evaporation Rate:	No information available
(i) Flammability limits in air -upper (%):	3000 g/m ³
(j) Flammability limits in air – low (%):	750 g/m ³
(k) Vapor Pressure:	0.0000033 kPa
(l) Vapor Density:	No information available
(m) Relative Density	No information available
(n) Solubility(ies)	Not applicable
(o) Partition Coefficient: n-octanol/water	No information available
(p) Auto-ignition Temperature	No information available
(q) Decomposition Temperature	No information available
(r) Viscosity	No information available
(s) Molecular Weight:	279.1

Section 10 - Stability and Reactivity

(a) Reactivity	No data available.
(b) Chemical Stability	Stable under recommended storage conditions.
(c) Possibility of Hazardous Reactions	No information available.
(d) Conditions to Avoid	Keep away from heat.
(e) Incompatible Materials	Acids. Alkali metals. Oxidizing agents.
(f) Hazardous Decomposition Products	Halogenated hydrocarbons. Organic compounds of phosphoric compounds. Organic nitrogenous products of decomposition.

Section 11 - Toxicological Information

(a) Likely Routes of Exposure	Inhalation. Ingestion, eye or skin contact.
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(b) Symptoms related to the physical, chemical and toxicological characteristics	Direct contact with eyes may cause temporary irritation. Mild skin irritation. May cause an allergic skin reaction. Dermatitis. Rash. The most common adverse effects reported with clinical use were diarrhea, nausea, rash, and vomiting.
(c) Delayed and immediate effects and chronic effects from short and long term exposure	Not available. FDA Pregnancy Category: C


(d) Acute Toxicity

Ingestion may result in mild gastrointestinal irritation with nausea, vomiting, or diarrhea.

Component	Type	Route	Species	Dosage
Cyclophosphamide	LD ₅₀	Oral	Rat	342 mg/kg

Inhalation:	Toxic: danger danger of serious damage to health by prolonged exposure through inhalation. Irritating to respiratory system.
Eye contact:	Risk of serious damage to eyes
Skin contact:	Toxic: danger of serious damage to health by prolonged exposure with skin.
Ingestion:	Harmful if swallowed. Toxic: danger of serious damage to health by prolonged exposure if swallowed. Gastrointestinal effects (may include nausea/vomiting, abdominal pain, diarrhea, dry mouth, colic). Dermatologic effects (may include exfoliative dermatitis, photosensitivity, rash, itching). Hair loss. Blood effects (may include anemia, neutropenia (decreased number of neutrophils), thrombocytopenia (decreased number of platelets), bone marrow depression). Immune system effects.

Irritation	
Corrosivity:	
Sensitization:	
Mutagenic effects:	Contains a known or suspected mutagen
Carcinogenic effects:	Contains a known or suspected carcinogen.
Reproductive toxicity:	May impair fertility. May cause harm to the unborn child. May cause harm to breastfed babies.
STOT - single exposure:	No information available
STOT - repeated exposure:	Bladder. Bone marrow.
Aspiration Hazard:	No information available.

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Section 12 - Ecological Information


(a) Ecotoxicity	<p><u>Persistence and degradability</u> Not readily biodegradable</p> <p><u>Bioaccumulative potential</u> No data available</p> <p><u>Mobility in soil</u> High mobility in soil</p> <p><u>Results of PBT and vPvB assessment</u> This substance is not considered to be persistent, bioaccumulating nor toxic (PBT). This substance is not considered to be very persistent nor very bioaccumulating (vPvB).</p> <p><u>Other adverse effects</u> Endocrine Disruptor information: No information available</p> <table border="1"> <thead> <tr> <th>Component</th> <th>Type</th> <th>Species</th> <th>Test Results</th> </tr> </thead> <tbody> <tr> <td rowspan="3">Cyclophosphamide</td> <td>NOEC (96 h)</td> <td>Salmo gaidneri</td> <td>>984 mg/l</td> </tr> <tr> <td>NOEC (48 h)</td> <td>Daphnia magna</td> <td>>987 mg/l</td> </tr> <tr> <td>EC 10 (16h)</td> <td>Pseudomonas putida</td> <td>>1000 mg/l</td> </tr> </tbody> </table>	Component	Type	Species	Test Results	Cyclophosphamide	NOEC (96 h)	Salmo gaidneri	>984 mg/l	NOEC (48 h)	Daphnia magna	>987 mg/l	EC 10 (16h)	Pseudomonas putida	>1000 mg/l
Component	Type	Species	Test Results												
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	EC 10 (16h)	Pseudomonas putida	>1000 mg/l												

Section 13 - Disposal Considerations

Waste Disposal:
Waste from residues / unused products:
 In accordance with local and national regulations.
Contaminated Packaging:
 In accordance with local and national regulations.

Section 14 - Transport Information

In accordance with local and national regulations.
DOT: Not regulated as a dangerous good.
IATA: Not regulated as a dangerous good.
IMDG: Not regulated as a dangerous good.

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Section 15 - Regulatory Information

Below is selected regulatory information chosen primarily for possible Athenex Pharmaceutical Division usage. This section is not a complete analysis or reference to all applicable regulatory information. Please consider all applicable laws and regulations for your country/state.

U.S. Regulations: TSCA – Not regulated

CERCLA - 2-[bis(2-chloroethyl)amino]tetrahydro-2H-1,3,2-oxazaphosphorine 2-oxide monohydrate
Listed

SARA 302 - Not on this list

SARA 304 - Not on this list

SARA 311/312: Not on this list

SARA 313 - Not regulated

OSHA – Not on this list

Section 16 - Other Information


As of the date of effectiveness, we are providing available information relevant to the handling of this material in the workplace. All information contained herein is offered with the good faith belief that it is accurate. THIS SAFETY DATA SHEET SHALL NOT BE DEEMED TO CREATE ANY WARRANTY OF ANY KIND (INCLUDING WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE). In the event of an adverse incident associated with this material, this safety data sheet is not intended to be a substitute for consultation with appropriately trained personnel. Nor is this safety data sheet intended to be a substitute for product literature which may accompany the finished product.

For additional information contact:

Athenex Pharmaceutical Division
10 N. Martingale Road, Suite 230
Schaumburg, IL 60173
847-886-9515

Glossary: This glossary contains definitions of general terms used in SDSs. Not all of these Glossary Terms will apply to this SDS.

ACGIH	American Conference of Governmental Industrial Hygienists
AICS	Australian Inventory of Chemical Substances
AIHA	American Industrial Hygiene Association
ANSI	American National Standards Institute
CAS Number	Chemical Abstract Service Registry Number
CERCLA	Comprehensive Environmental Response Compensation and Liability Act (of
CHAN	Chemical Hazard Alert Notice
CHEMTREC	Chemical Transportation Emergency Center
DOT	Department of Transportation
DSL	Domestic Substances List
ECHA	European Chemicals Agency
EINECS	European Inventory of Existing Commercial Chemical Substances
ELINCS	European List of Notified Chemical Substances

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EPA	Environmental Protection Agency
GHS	Globally Harmonized System of Classification and Labelling of Chemicals
HEPA	High Efficiency Particulate Air (Filter)
HMIS	Hazardous Materials Identification System
IARC	International Agency for Research on Cancer
ICAO/IATA	International Civil Aviation Organization/International Air Transport
IMO	International Maritime Organization
KOW	Octanol/Water Partition Coefficient
LEL	Lower Explosive Limit
MSDS	Material Safety Data Sheet
MSHA	Mine Safety and Health Administration
NA	Not Applicable, except in Section 14 where NA = North America
NE	Not Established
NADA	New Animal Drug Application
NAIF	No Applicable Information Found
NCI	National Cancer Institute
NDSL	Non-Domestic Substances List
NFPA	National Fire Protection Association
NIOSH	National Institute for Occupational Safety and Health
NPDES	National Pollutant Discharge Elimination System
NOS	Not Otherwise Specified
NTP	National Toxicology Program
OSHA	Occupational Safety and Health Administration
OEL	Occupational Exposure Limit
PEL	Permissible Exposure Limit (OSHA)
RCRA	Resource Conservation and Recovery Act
RQ	Reportable Quantity
RTECS	Registry of Toxic Effects of Chemical Substances
SARA	Superfund Amendments and Reauthorization Act
SDS	Safety Data Sheet
STEL	Short Term Exposure Limit
TLV	Threshold Limit Value (ACGIH)
TPQ	Threshold Planning Quantity
TSCA	Toxic Substances Control Act
TWA	Time Weighted Average/8 Hours Unless Otherwise Noted
UEL	Upper Explosive Limit
UN	United Nations
USP	United States Pharmacopeia
WEEL	Workplace Environmental Exposure Level (AIHA)
WHMIS	Workplace Hazardous Materials Information System

Signature Manifest

Document Number: SDS042

Revision: 03

Title: Cyclophosphamide Injection SDS

All dates and times are in Eastern Standard Time.

SDS Revision

Change Request

Name/Signature	Title	Date	Meaning/Reason
Tara Benware (TBENWARE)	Quality Assurance Document Spe		
Diana Wilkens (DWILKENS)	QA Document Specialist II		
Sean Switzer (SSWITZER)	QMS Analyst - Global Systems		
Christopher Martensen (CMARTENSEN)	Quality Engineer-CSV		
Emily Berdyck (EBERDYCK)	Quality Assurance Supervisor	19 Nov 2021, 11:27:01 AM	Approved

Dept Approval

Name/Signature	Title	Date	Meaning/Reason
John Andre (EXT-JANDRE)	Regulatory Affairs Consultant	24 Nov 2021, 12:05:22 PM	Approved

Final QA Approval/Set Effective Date

Name/Signature	Title	Date	Meaning/Reason
Karen Ryan (KARENRYAN)	VP of Global Quality Assurance	24 Nov 2021, 02:26:39 PM	Approved