



PhosphoCruz™ Protein Purification System: sc-24964

BACKGROUND

The PhosphoCruz™ Protein Purification System is an affinity purification system developed to enrich/isolate phosphoproteins from cell lysates for phosphorylation studies of desired proteins of interest. Proteins that carry a phosphate group are specifically retained on the resin, whereas the non-phosphorylated proteins flow through the column and are collected in the unbound fraction. The phosphoproteins retained on the resin are subsequently eluted from the resin to obtain the phospho-enriched protein fraction of interest for analysis.

PRODUCT

The PhosphoCruz™ Protein Purification System contains all the materials required for six individual phosphoprotein enrichment procedures via Immobilized Metal Affinity Chromatography (IMAC). Each kit contains six PhosphoCruz™ Resin columns, 100 ml of 2X Binding/Wash Buffer, 30 ml of PhosphoCruz™ Elution Buffer, 150 µl each of PhosphoCruz™ Phosphatase Inhibitor cocktails 1 and 2, six Ultrafiltration Concentrators (10,000 MWCO) and six caps for storage of PhosphoCruz™ Resin columns.

PROTOCOL AND USAGE

The following procedure takes approximately 1.5 to 2 hours to isolate the desired phospho-enriched fraction from cell lysates. To minimize phosphatase activity, keep buffers, lysates and enriched fractions on ice and utilize the phosphatase cocktails supplied with the kit. In general, phosphoprotein yields are dependent upon the induction status of the lysate and will typically fall between 5-10% of the total protein loaded.

Follow standard cell lysis protocol and determine the protein concentration of the lysate via protein assay. Keep on ice.

Drain storage buffer from PhosphoCruz™ Resin column by breaking the tip and equilibrate resin with approximately 5-10 ml of the 2X Binding/Wash buffer.

Dilute 2.5-5.0 mg (total protein) of whole cell lysate to 0.5-1.0 mg/ml with the supplied 2X Binding/Wash Buffer. Note: It is important to dilute the cell lysate with at least four parts Binding/Wash buffer to one part lysate. In order to perform the desired batch purification of the lysate, the total volume must not exceed 9 ml. Optional: To the final volume of the diluted lysate solution, add enough PhosphoCruz™ Phosphatase Inhibitor Cocktail 1 and 2 to achieve a final dilution of 1/250 to inhibit phosphatase activity.

Add the diluted lysate to the PhosphoCruz™ Resin column and secure both ends of the column. Tighten the column cap. Gently resuspend the resin/cell lysate slurry and rotate for 30 minutes at 4° C.

The following washing and elution steps are performed without adding phosphatase inhibitors to these solutions. Phosphatase inhibitors can interfere with the reading of samples at OD280 and with performing protein assays of the eluted fractions. Therefore, it is essential that the following steps are performed quickly and the collected fraction(s) are kept on ice.

After the 30 minute incubation, collect flow through (unbound fraction), by breaking the tip on the end of the PhosphoCruz™ Resin column, and save for testing if desired.

PROTOCOL AND USAGE *cont.*

Wash column with 3-5 2 ml aliquots of the 2X Binding/Wash buffer. Proceed to following step when protein is no longer detected in the wash. If desired, save and pool fractions containing protein for testing. After thoroughly washing column, immediately elute with several 1 ml aliquots of the PhosphoCruz™ Elution Buffer. Read fractions at OD280 to determine which fraction(s) contain the eluted phosphoproteins. Note: The desired phospho- proteins usually elute in fractions 2 and 3. Save appropriate fractions for testing via Western blotting.

The collected phospho-enriched fraction(s) generally require concentration. Using the Ultrafiltration Concentrators supplied, concentrate sample as follows.

Insert sample reservoir into vial.

Pipette solution into sample reservoir (0.5 ml maximum volume) without touching the membrane with the pipet tip. Seal with attached cap.

Place assembly in a compatible centrifuge and counterbalance. Note: When placing the assembled device into the centrifuge rotor, align the cap strap toward the center of the rotor.

Spin at 4° C for 60 minutes. Do not exceed 14,000 xg.

Remove assembly from centrifuge. Separate filtrate vial from sample reservoir.

Place sample reservoir upside down in a new vial and spin for 3 minutes at 1000 xg (or pulse briefly) to transfer concentrated phospho-enriched sample to retentate vial. Discard sample reservoir.

Immediately add 2X electrophoresis sample buffer to the concentrated phospho-enriched sample and test via Western blotting. Optional: If sample is not to be used immediately or for applications where dilution with sample buffer is undesirable, utilize the phosphatase inhibitors supplied at a 1/250 dilution in order to protect the phosphoprotein-enriched fraction.

PROTOCOL AND USAGE REFERENCES

- Andersson, L. and Porath, J. 1986. Isolation of phosphoproteins by immobilized metal (Fe³⁺) affinity chromatography. *Anal. Biochem.* 154: 250-254.
- Anguenot, R., et al. 1999. Purification of tomato sucrose synthase phosphorylated isoforms by Fe(III)-immobilized metal affinity chromatography. *Arch. Biochem. Biophys.* 365: 163-169.
- Ficarro, S., et al. 2003. Phosphoproteome analysis of capacitated human sperm. Evidence of tyrosine phosphorylation of a kinase-anchoring protein 3 and valosin-containing protein/p97 during capacitation. *J. Biol. Chem.* 278: 11579-11589.
- Lashner, B.A., et al. 1986. Acute pancreatitis associated with high-concentration lipid emulsion during total parenteral nutrition therapy for Crohn's disease. *Gastroenterology* 90: 1039-1041.

STORAGE

Store at 4° C. Stable for one year from the date of shipment.

PhosphoCruz Protein Purification System (contains Ammonium Bicarbonate)

*The Power to Question*

Section 1 - Chemical Product and Company Identification

MSDS Name: Ammonium Bicarbonate**Catalog Numbers:** sc-24964**Synonyms:** Ammonium hydrogencarbonate**Company Identification:**

Santa Cruz Biotechnology, Inc.

2145 Delaware Avenue

Santa Cruz, CA 95060

For information, call: 800.457.3801 / 831.457.3800 Fax: 831.457.3801**Emergency Number:** 831.457.3800 x121/ 831.251.2170

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1066-33-7	Ammonium bicarbonate	100	213-911-5

Hazard Symbols: XN**Risk Phrases:** 22 36/37/38

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless to white solid. **Warning!** Causes eye and skin irritation. May cause digestive tract irritation. Causes respiratory tract irritation. Irritant. Harmful if swallowed.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation. May cause chemical conjunctivitis.

Skin: Causes skin irritation. May be harmful if absorbed through the skin.

Ingestion: Harmful if swallowed. May cause irritation of the digestive tract.

Inhalation: Causes respiratory tract irritation. May be harmful if inhaled. Can produce delayed pulmonary edema.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water. Wash mouth out with water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid. Do NOT use mouth-to-mouth resuscitation.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Minimize dust generation and accumulation. Avoid breathing dust, vapor, mist, or gas. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Use with adequate ventilation. Wash clothing before reuse.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ammonium bicarbonate	none listed	none listed	none listed

OSHA Vacated PELs: Ammonium bicarbonate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: colorless to white

Odor: ammonia-like - weak odor

pH: 7.8 @ 0.1N.

Vapor Pressure: 60 mm Hg @ 25 C

Vapor Density: Not available.

Evaporation Rate: Not applicable.

Viscosity: Not available.

Boiling Point: Decomposes.

Freezing/Melting Point: 140 deg F

Decomposition Temperature: 140 deg F

Solubility: 17.4 % @ 20C in water.

Specific Gravity/Density: 1.586

Molecular Formula: NH₄HCO₃

Molecular Weight: 79.0399

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: Dust generation, excess heat.

Incompatibilities with Other Materials: Oxidizing agents, strong acids, nitrates, nitrites, alkalis.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, ammonia.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 1066-33-7: BO8600000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 1066-33-7: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Neurotoxicity: No information available.

Mutagenicity: No information available.

Other Studies: No data available.

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	No information available.				No information available.
Hazard Class:					
UN Number:					
Packing Group:					

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1066-33-7 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

CERCLA Hazardous Substances and corresponding RQs

CAS# 1066-33-7: 5000 lb final RQ; 2270 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depleters. This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

CAS# 1066-33-7 is listed as a Hazardous Substance under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1066-33-7 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

XN

Risk Phrases:

R 22 Harmful if swallowed.

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 1066-33-7: 1

Canada - DSL/NDL

CAS# 1066-33-7 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

Canadian Ingredient Disclosure List**Exposure Limits**

Section 16 - Additional Information

MSDS Creation Date: 12/12/1997

Revision #4 Date: 11/14/2003

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

Material Safety Data Sheet

1. Product and Company Identification

Supplier Santa Cruz Biotechnology, Inc.
2145 Delaware Avenue
Santa Cruz, California 95060
(831) 457-3800 / (800) 457-3801
FAX: (831) 457-3801

Catalog #: sc-24964

Product name Phosphatase Inhibitor Cocktail I

2. Composition and Information on Ingredients

<u>Ingredient Name</u>	<u>CAS No.</u>	<u>Product No.</u>	<u>EU Symbol</u>	<u>R-Phrases</u>
Cantharidin	56-25-7	RC0880	T+	R28, R36/37/38

Note: See section 8 for occupational exposure limits and section 11 for LC50/LD50 information.

3. Hazards Identification

Primary Hazards and Critical Effects	: RC0880	DANGER! MAY BE FATAL IF SWALLOWED. MAY CAUSE RESPIRATORY TRACT, EYE AND SKIN IRRITATION. Avoid contact with eyes, skin and clothing. Do not ingest. Avoid breathing dust. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.
Physical/Chemical hazards	: RC0880	Not applicable.
Human Health Hazards	: RC0880	Very toxic if swallowed. Irritating to eyes, respiratory system and skin.
Environmental Hazards	: RC0880	Not applicable.

4. First Aid Measures

Inhalation	: RC0880	If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
Ingestion	: RC0880	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.
Skin Contact	: RC0880	In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.
Eye Contact	: RC0880	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.
Notes to Medical Doctor	: RC0880	Not available.

5. Fire-Fighting Measures

Extinguishing Media	: Use foam or all purpose dry chemicals to extinguish.
Fire-Fighting Procedures	: Fire fighters should wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear.
Fire/Explosion Hazards	: Not applicable.
Hazardous Decomposition Products	: These products are carbon oxides (CO, CO2).

6. Accidental Release Measures

Personal Precautions	:	Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment (Section 8). Follow all fire fighting procedures (Section 5).
Environmental Precautions and Clean-up Methods	:	If emergency personnel are unavailable vacuum or carefully scoop up spilled materials and place in an appropriate container for disposal. Avoid creating dusty conditions and prevent wind dispersal. Minimize contact of spilled material with soils to prevent runoff to surface waterways.

Note: See section 1 for emergency contact information and section 13 for waste disposal.

7. Handling and Storage

Handling	:	RC0880	Avoid contact with eyes, skin and clothing. Do not ingest. Avoid breathing dust. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.
Storage	:	Keep container tightly closed. Keep container in a cool, well-ventilated area.	
Packaging Materials	:	Use original container.	

8. Exposure Controls and Personal Protection

Occupational Exposure Limits

<u>Ingredient Name</u>	<u>Occupational Exposure Limits</u>
RC0880	Not available.

Engineering Controls	:	RC0880	Open handling is not permitted. All handling must be performed in a glove box or other totally enclosed system.
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Personal Protective Equipment

Respiratory System	:	RC0880	Use an approved, properly fitted, HEPA filter cartridge respirator, or a respirator of greater protection if there is the potential to exceed the exposure limit(s).
Skin and Body	:	RC0880	Disposable outer garments, or impervious garments of equal or greater protection.
Hands	:	RC0880	Use latex gloves. Additional body garments should be used based upon the task being performed (e.g., sleevelets, apron, gauntlets, disposable suits).
Eyes	:	RC0880	Safety glasses. Goggles, face shield, or other full-face protection if potential exists for direct exposure to dust.

9. Physical and Chemical Properties

Kit Components

1ml vial Phosphatase Inhibitor Cocktail, containing Cantharidin (RC0880) (-)-p-Bromotetramisole Oxalate, Calyculin A, *Discodermia calyx*.

Flash Point

Not available.

10. Stability and Reactivity

Stability	:	RC0880	The product is stable.
Conditions and Materials to Avoid	:	RC0880	Reactive with oxidizing agents.
Hazardous Decomposition Products	:	RC0880	Not available.

11. Toxicological Information

Toxicity Data

<u>Ingredient Name</u>	<u>Test</u>	<u>Result</u>	<u>Route</u>	<u>Species</u>
RC0880	LDLo	0.428 mg/kg	Oral	Human
	LDLo	20 mg/kg	Oral	Rabbit
	LDLo	50 mg/kg	Oral	Dog

Routes of Entry	:	Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.
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Acute Effects

Inhalation	:	RC0880	Moderately irritating to the respiratory system.
Ingestion	:	RC0880	Very toxic if swallowed.

	:		
Skin Contact	:	RC0880	Moderately irritating to the skin.
Eye Contact	:	RC0880	Moderately irritating to the eyes.
Chronic Effects			
Adverse Effects	:	RC0880	Not available.
Target Organs	:	RC0880	Not available.
Carcinogenic Effects	:	RC0880	Classified None. by NIOSH. 3 (Not classifiable for human.) by IARC.
Mutagenic Effects	:	RC0880	Not available.
Developmental and Teratogenic Effects	:	RC0880	Not available.
Reproductive Effects	:	RC0880	Not available.
Other Information	:	RC0880	Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

12. Ecological Information

Ecotoxicity Data

<u>Ingredient Name</u>	<u>Species</u>	<u>Period</u>	<u>Result</u>
RC0880	Not available.	Not available.	Not available.

13. Disposal Consideration

Waste Handling and Disposal : Waste must be disposed of in accordance with federal, state and local environmental control regulations.

14. Transport Information

Air

IATA-DGR Class : Not controlled under IATA.

Packing Group

15. Regulatory Information

EU Regulations

Hazard Symbol(s)	:	T+
Risk Phrases	:	R28- Very toxic if swallowed. R36/37/38- Irritating to eyes, respiratory system and skin.
Safety Phrases	:	S1/2- Keep locked up and out of the reach of children. S28- After contact with skin, wash immediately with plenty of [***]. S36/37- Wear suitable protective clothing and gloves. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

US Regulations

Haz-Com Standard	:	Not controlled under the HCS (United States).
EPA	:	TSCA 8(b) inventory: cantharidin SARA 302/304/311/312 extremely hazardous substances: cantharidin SARA 302/304 emergency planning and notification: cantharidin SARA 302/304/311/312 hazardous chemicals: cantharidin SARA 311/312 MSDS distribution - chemical inventory - hazard identification: cantharidin: Immediate (Acute) Health Hazard
State	:	Pennsylvania RTK: cantharidin: (environmental hazard, generic environmental hazard) Massachusetts RTK: cantharidin New Jersey: cantharidin

Canadian Regulations

WHMIS	:	Not controlled under WHMIS (Canada).
CEPA	:	CEPA NDSL: cantharidin
Provincial	:	No products were found.

16. Other Information

The above information is believed to be correct but does not purport to be complete and should be used only as a guide. The burden of safe use of this material rests entirely with the user.

Emergency Contact:

Santa Cruz Biotechnology, Inc.
2145 Delaware Avenue
Santa Cruz, California 95060
800.457.3801 or 831.457.3800
or Luis Yanez 831.251.2170



The Power to Question

MATERIAL SAFETY DATA SHEET

PhosphoCruz™ Protein Purification System: PHOSPHATASE INHIBITOR COCKTAIL II
Date Printed: 09/24/2004

Section 1 - Product and Company Information

Product Name PHOSPHATASE INHIBITOR COCKTAIL II
Product Number SC-24964

Company Santa Cruz Biotechnology, Inc.
Street Address 2145 Delaware Avenue
City, State, Zip, Country Santa Cruz, CA 95060
Technical Phone: 800.457.3801 / 831.457.3800
Emergency Phone: 831.457.3800 x121/ 831.251.2170
Fax: 831.457.3801

Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
PHOSPHATASE INHIBITOR COCKTAIL II	None	No

Ingredient Name	CAS #	Percent	SARA 313
Information regarding the specific chemical identity of this material is being withheld as a trade secret of the manufacturer.	None		
SODIUM ORTHOVANADATE	13721-39-6		No
MOLYBDIC ACID SODIUM DIHYDRATE	10102-40-6		No

Synonyms protease inhibitor for phosphatase inhibition
(water soluble)

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Toxic.
Harmful by inhalation, in contact with skin and if swallowed.
Irritating to eyes, respiratory system and skin.

HMIS RATING

HEALTH: 2
FLAMMABILITY: 0
REACTIVITY: 0

NFPA RATING

HEALTH: 2
FLAMMABILITY: 0
REACTIVITY: 0

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

ORAL EXPOSURE

If swallowed, wash out mouth with water provided person is conscious. Call a physician.

INHALATION EXPOSURE

If inhaled, remove to fresh air. If breathing becomes difficult, call a physician.

DERMAL EXPOSURE

In case of contact, immediately wash skin with soap and copious amounts of water.

EYE EXPOSURE

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

Section 5 - Fire Fighting Measures

FLASH POINT

N/A

AUTOIGNITION TEMP

N/A

FLAMMABILITY

N/A

EXTINGUISHING MEDIA

Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

FIREFIGHTING

Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
Specific Hazard(s): Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Exercise appropriate precautions to minimize direct contact with skin or eyes and prevent inhalation of vapors.

METHODS FOR CLEANING UP

Absorb on sand or vermiculite and place in closed containers for disposal. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

HANDLING

User Exposure: Avoid inhalation. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

STORAGE

Suitable: Keep tightly closed.
Store at 2-8°C

Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS

Safety shower and eye bath. Mechanical exhaust required.

PERSONAL PROTECTIVE EQUIPMENT

Hand: Protective gloves.

Eye: Chemical safety goggles.

GENERAL HYGIENE MEASURES

Wash thoroughly after handling.

Section 9 - Physical/Chemical Properties

Appearance	Physical State: Clear liquid Color: Yellow	
Property	Value	At Temperature or Pressure
Molecular Weight	N/A	
pH	10	
BP/BP Range	N/A	
MP/MP Range	N/A	
Freezing Point	N/A	
Vapor Pressure	N/A	
Vapor Density	N/A	
Saturated Vapor Conc.	N/A	
SG/Density	N/A	
Bulk Density	N/A	
Odor Threshold	N/A	
Volatile%	N/A	
VOC Content	N/A	
Water Content	N/A	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	N/A	
Surface Tension	N/A	
Partition Coefficient	N/A	
Decomposition Temp.	N/A	
Flash Point	N/A	
Explosion Limits	N/A	
Flammability	N/A	
Autoignition Temp	N/A	
Refractive Index	N/A	
Optical Rotation	N/A	
Miscellaneous Data	N/A	
Solubility	N/A	

N/A = not available

Section 10 - Stability and Reactivity

STABILITY

Stable: Stable.

Materials to Avoid: Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide, Nitrogen oxides.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information

ROUTE OF EXPOSURE

Skin Contact: May cause skin irritation.

Skin Absorption: May be harmful if absorbed through the skin.

Eye Contact: May cause eye irritation.

Inhalation: May be harmful if inhaled. Material may be irritating to mucous membranes and upper respiratory tract.
Ingestion: May be harmful if swallowed.

SIGNS AND SYMPTOMS OF EXPOSURE

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Section 12 - Ecological Information

No data available.

Section 13 - Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION

Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT

Proper Shipping Name: None
Non-Hazardous for Transport: This substance is considered to be non-hazardous for transport.

IATA

Non-Hazardous for Air Transport: Non-hazardous for air transport.

Section 15 - Regulatory Information

EU ADDITIONAL CLASSIFICATION

S: 24/25 23

Safety Statements: Avoid contact with skin and eyes. Do not breathe vapor spray.

US CLASSIFICATION AND LABEL TEXT

Indication of Danger: Toxic.

Risk Statements: Harmful by inhalation, in contact with skin and if swallowed. Irritating to eyes, respiratory system and skin.

Safety Statements: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing and gloves.

UNITED STATES REGULATORY INFORMATION

SARA LISTED: No

CANADA REGULATORY INFORMATION

WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

DSL: No

NDSL: No

Section 16 - Other Information

DISCLAIMER

For R&D use only. Not for drug, household or other uses.

WARRANTY

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product.