

Copper Reagent #1

R-0860

SDS Revision Date (mm/dd/yyyy): 10/29/2019

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## SAFETY DATA SHEET

### SECTION 1. IDENTIFICATION

Product identifier used on the label

: **Copper Reagent #1**

Other means of identification : R-0860

Recommended use of the chemical and restrictions on use

: Use as directed by manufacturer for purposes directly related to water testing.  
Recommended restrictions: None known.

Chemical family : Mixture.

Name, address, and telephone number of the supplier:

**Lowry & Associates, Div. of Chem-Aquascience, Inc.**

5-1151 Gorham Street  
Newmarket, ON, Canada  
L3Y 8Y1

Supplier's Telephone # : (905) 836-0505, Hours 09:00 to 16:30

24 Hr. Emergency Tel # : Not available.

Name, address, and telephone number of the manufacturer:

Refer to supplier

### SECTION 2. HAZARDS IDENTIFICATION

Classification of the chemical

Clear, colorless liquid. Odorless.

This material is classified as hazardous under U.S. OSHA regulations (29CFR 1910.1200) (Hazcom 2012) and Canadian WHMIS regulations (Hazardous Products Regulations) (WHMIS 2015).

Hazard classification:

Corrosive to Metals - Category 1

Skin Corrosion/Irritation - Category 1

Acute toxicity, oral - Category 4

Eye Damage/Irritation - Category 1

Specific target organ toxicity, single exposure - Category 3 respiratory tract irritation

Label elements

Hazard pictogram(s)



Signal Word

DANGER!

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*Hazard statement(s)*

May be corrosive to metals.  
 Harmful if swallowed.  
 Causes severe skin burns and eye damage.  
 May cause respiratory irritation.

*Precautionary statement(s)*

Keep only in original container.  
 Do not breathe mist.  
 Do not eat, drink or smoke when using this product.  
 Wash thoroughly after handling.  
 Use only outdoors or in a well-ventilated area.  
 Wear protective gloves/clothing and eye/face protection.

IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.  
 Call a POISON CENTER or doctor/physician if you feel unwell.  
 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.  
 Wash contaminated clothing before reuse.  
 If inhaled: Remove person to fresh air and keep comfortable for breathing.  
 Immediately call a POISON CENTER or doctor/physician.  
 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
 Immediately call a POISON CENTER or doctor/physician.  
 Absorb spillage to prevent material damage.

Store locked up.  
 Store in a well-ventilated place. Keep container tightly closed.  
 Store in corrosive resistant container with a resistant inner liner.

Dispose of contents/container in accordance with local regulation.

**Other hazards**

Other hazards which do not result in classification: Ingestion can cause irritation and corrosive action in the mouth, stomach and digestive tract.

**SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS**

Mixture

<u>Chemical name</u>	<u>Common name and synonyms</u>	<u>CAS #</u>	<u>Concentration (% by weight)</u>
Ammonium hydroxide	Ammonium water	1336-21-6	5.0 - 10.0
Citric acid monohydrate	Citric acid	5949-29-1	5.00

**SECTION 4. FIRST-AID MEASURES**

**Description of first aid measures**

- Ingestion* : Never give anything by mouth to an unconscious person. Do NOT induce vomiting. Have victim rinse mouth with water, then give one to two glasses of water to drink. Seek immediate medical attention/advice.
- Inhalation* : Immediately remove person to fresh air. If breathing is difficult, give oxygen by qualified medical personnel only. If breathing has stopped, give artificial respiration. Seek immediate medical attention/advice.

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*Skin contact* : Wear appropriate protective equipment. Remove/Take off immediately all contaminated clothing. Immediately flush skin with gently flowing, running water for at least 20 minutes. Do not rub area of contact. Obtain medical attention immediately. Wash contaminated clothing before reuse. Contaminated leather may require disposal.

*Eye contact* : Wear appropriate protective equipment. Protect unharmed eye. If in contact with eyes, immediately flush eyes with running water for at least 20 minutes. If contact lens is present, DO NOT delay flushing or attempt to remove the lens until flushing is done. Obtain medical attention immediately.

### Most important symptoms and effects, both acute and delayed

: Causes severe skin irritation. Symptoms may include redness, blistering, pain and swelling. Causes serious eye damage. Symptoms may include severe pain, blurred vision, redness and corrosive damage. May cause respiratory irritation. Symptoms may include coughing, choking and wheezing. Could result in pulmonary edema (fluid accumulation). Symptoms of pulmonary edema (chest pain, shortness of breath) may be delayed. Ingestion may cause severe burns to the mucous membranes of the digestive tract. Symptoms may include abdominal pain, vomiting, burns, perforations and bleeding.

### Indication of any immediate medical attention and special treatment needed

: Immediate medical attention is required. Causes chemical burns. Treat symptomatically.

## SECTION 5. FIRE-FIGHTING MEASURES

### Extinguishing media

#### *Suitable extinguishing media*

: Use media suitable to the surrounding fire such as water fog or fine spray, alcohol foams, carbon dioxide and dry chemical. May react with water. Use water spray with caution.

#### *Unsuitable extinguishing media*

: Use water spray with caution. Do not use a solid water stream as it may scatter and spread fire.

### Special hazards arising from the substance or mixture / Conditions of flammability

: Not considered flammable. Closed containers may rupture if exposed to excess heat or flame due to a build-up of internal pressure.

### Flammability classification (OSHA 29 CFR 1910.106)

: Not flammable.

### Hazardous combustion products

: Chlorine ;Ammonia.

### Special protective equipment and precautions for firefighters

#### *Protective equipment for fire-fighters*

: Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA.

#### *Special fire-fighting procedures*

: Do not enter without wearing specialized protective equipment suitable for the situation. Firefighter's normal protective clothing (Bunker Gear) will not provide adequate protection. A full-body encapsulating chemical protective suit with positive pressure self-contained breathing apparatus (NIOSH approved or equivalent) may be necessary.

## SECTION 6. ACCIDENTAL RELEASE MEASURES

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### Personal precautions, protective equipment and emergency procedures

- : Restrict access to area until completion of clean-up. Ensure clean-up is conducted by trained personnel only. All persons dealing with clean-up should wear the appropriate protective equipment including self-contained breathing apparatus. Refer to Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION, for additional information on acceptable personal protective equipment.

### Environmental precautions

- : Ensure spilled product does not enter drains, sewers, waterways, or confined spaces. If necessary, dike well ahead of the spill to prevent runoff into drains, sewers, or any natural waterway or drinking supply.

### Methods and material for containment and cleaning up

- : Remove all sources of ignition. Ventilate area of release. Stop the spill at source if it is safe to do so. Dike for water control. Contain and absorb spilled liquid with non-combustible, inert absorbent material (e.g. sand), then place absorbent material into a container for later disposal (see Section 13). Notify the appropriate authorities as required.

### Special spill response procedures

- : If a spill/release in excess of the EPA reportable quantity is made into the environment, immediately notify the national response center in the United States (phone: 1-800-424-8802).  
 US CERCLA Reportable quantity (RQ): Ammonium hydroxide (1000 lbs / 454 kg).

## SECTION 7. HANDLING AND STORAGE

### Precautions for safe handling

- : Wear protective gloves/clothing and eye/face protection. Use only in well-ventilated areas. Do not breathe fumes or mists. Do not eat, drink or smoke when using this product. Avoid contact with skin, eyes and clothing. Wash thoroughly after handling. Keep away from heat and flame. Keep away from incompatibles. Keep containers tightly closed when not in use. Keep only in original container.

### Conditions for safe storage

- : Store in a well-ventilated place. Keep container tightly closed. Store locked up. Keep away from incompatibles. Storage area should be clearly identified, clear of obstruction and accessible only to trained and authorized personnel. Inspect periodically for damage or leaks. Store in corrosion-resistant containers. Avoid contact with aluminum.

### Incompatible materials

- : Acids; Water; Metals (e.g. tin, aluminum, zinc and alloys containing these metals); Halogenated compounds; Nitrogen compounds.

## SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

<b>Exposure Limits:</b>				
<b>Chemical Name</b>	<b>ACGIH TLV</b>		<b>OSHA PEL</b>	
	<b>TWA</b>	<b>STEL</b>	<b>PEL</b>	<b>STEL</b>
Ammonium hydroxide	25 ppm (Ammonia)	35 ppm (Ammonia)	50 ppm (Ammonia)	N/Av
Citric acid monohydrate	N/Av	N/Av	N/Av	N/Av

### Exposure controls

#### Ventilation and engineering measures

- : Use only in well-ventilated areas. Use general or local exhaust ventilation to maintain air concentrations below recommended exposure limits.

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- Respiratory protection** : Respiratory protection is required if the concentrations exceed the TLV. NIOSH-approved respirators are recommended. A self contained breathing apparatus should be used in emergency situations or instances where exposure levels are not known. Seek advice from respiratory protection specialists. Respirators should be selected based on the form and concentration of contaminants in air, and in accordance with OSHA (29 CFR 1910.134) or CSA Z94.4-02.
- Skin protection** : Wear protective gloves/clothing. Advice should be sought from glove suppliers. Wear chemically protective gloves (impervious), boots, aprons, and gauntlets to prevent prolonged or repeated skin contact.
- Eye / face protection** : Wear eye/face protection. Chemical splash goggles must be worn when handling this material. A full face shield may also be necessary.
- Other protective equipment** : An eyewash station and safety shower should be made available in the immediate working area. Other equipment may be required depending on workplace standards.
- General hygiene considerations** : Do not breathe fumes or mists. Do not ingest. Avoid contact with skin, eyes and clothing. Do not eat, drink, smoke or use cosmetics while working with this product. Upon completion of work, wash hands before eating, drinking, smoking or use of toilet facilities. Remove soiled clothing and wash it thoroughly before reuse.

### SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance** : Colourless liquid.
- Odour** : No odour.
- Odour threshold** : Not applicable.
- pH** : 9.5
- Melting Point/Freezing point** : Not available.
- Initial boiling point and boiling range** : 100°C (212°F)
- Flash point** : Not applicable.
- Flashpoint (Method)** : Not applicable.
- Evaporation rate (BuAe = 1)** : N/Av
- Flammability (solid, gas)** : Not applicable.
- Lower flammable limit (% by vol.)** : Not applicable.
- Upper flammable limit (% by vol.)** : Not applicable.
- Oxidizing properties** : None known.
- Explosive properties** : Not explosive
- Vapour pressure** : 17 mmHg
- Vapour density** : 0.6
- Relative density / Specific gravity** : 1.0
- Solubility in water** : Soluble.
- Other solubility(ies)** : Not available.
- Partition coefficient: n-octanol/water or Coefficient of water/oil distribution** : N/Av (dissociates)
- Auto-ignition temperature** : N/Av
- Decomposition temperature** : Not available.
- Viscosity** : N/Av
- Volatiles (% by weight)** : 96%
- Volatile organic Compounds (VOC's)** : N/Av

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### Absolute pressure of container

: N/Ap

### Flame projection length

: N/Ap

### Other physical/chemical comments

: None known or reported by the manufacturer.

## SECTION 10. STABILITY AND REACTIVITY

**Reactivity** : Not normally reactive. May be corrosive to metals. Contact with most metals will generate flammable hydrogen gas. Contact with water will generate considerable heat.

**Chemical stability** : Material is stable under normal conditions.

### Possibility of hazardous reactions

: Hazardous polymerization does not occur.

**Conditions to avoid** : Avoid heat and open flame. Keep away from incompatibles. Keep container tightly closed when not in use. Avoid contact with water.

**Incompatible materials** : See Section 7 (Handling and Storage) for further details.

### Hazardous decomposition products

: None known, refer to hazardous combustion products in Section 5.

## SECTION 11. TOXICOLOGICAL INFORMATION

### Information on likely routes of exposure:

**Routes of entry inhalation** : YES

**Routes of entry skin & eye** : YES

**Routes of entry Ingestion** : YES

### Routes of exposure skin absorption

: NO

### Potential Health Effects:

#### Signs and symptoms of short-term (acute) exposure

##### *Sign and symptoms Inhalation*

: May cause severe irritation to the nose, throat and respiratory tract. Symptoms may include coughing, choking and wheezing. Could result in pulmonary edema (fluid accumulation). Symptoms of pulmonary edema (chest pain, shortness of breath) may be delayed.

##### *Sign and symptoms ingestion*

: Harmful if swallowed. May cause severe irritation and corrosive damage in the mouth, throat and stomach. Symptoms may include abdominal pain, vomiting, burns, perforations, bleeding and eventually death.

##### *Sign and symptoms skin*

: This material is classified as hazardous under U.S. OSHA regulations (29CFR 1910.1200) (Hazcom 2012) and Canadian WHMIS regulations (Hazardous Products Regulations) (WHMIS 2015). Classification: Skin Irritation - Category 1 Causes severe skin burns and eye damage.

##### *Sign and symptoms eyes*

: This material is classified as hazardous under U.S. OSHA regulations (29CFR 1910.1200) (Hazcom 2012) and Canadian WHMIS regulations (Hazardous Products Regulations) (WHMIS 2015). Classification: Eye Damage/Irritation - Category 1 Causes serious eye damage.

#### Potential Chronic Health Effects

: Chronic skin contact with low concentrations may cause dermatitis.

#### Mutagenicity

: Not expected to be mutagenic in humans.

#### Carcinogenicity

: No components are listed as carcinogens by ACGIH, IARC, OSHA or NTP.

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### Reproductive effects & Teratogenicity

: Not expected to have other reproductive effects.

### Sensitization to material

: Not expected to be a skin or respiratory sensitizer.

### Specific target organ effects

: This material is classified as hazardous under U.S. OSHA regulations (29CFR 1910.1200) (Hazcom 2012) and Canadian WHMIS regulations (Hazardous Products Regulations) (WHMIS 2015). Classification: Specific target organ toxicity, single exposure - Category 3 (respiratory) May cause respiratory irritation. Not classified as specific target organ toxicity-repeated exposure.

### Medical conditions aggravated by overexposure

: Pre-existing skin, eye and respiratory disorders.

### Synergistic materials

: Not available.

### Toxicological data

: There is no available data for the product itself, only for the ingredients. See below for individual ingredient acute toxicity data. The calculated ATE values for this mixture are: ATE oral = 1400 mg/kg

<u>Chemical name</u>	<u>LC<sub>50</sub>(4hr)</u> <u>inh, rat</u>	<u>LD<sub>50</sub></u>	
		<u>(Oral, rat)</u>	<u>(Rabbit, dermal)</u>
Ammonium hydroxide	3670 ppm (rat) (Ammonia) 2115 ppm (mouse) (Ammonia)	350 mg/kg	N/Av
Citric acid monohydrate	N/Av	N/Av	N/Av

### Other important toxicological hazards

: To the best of our knowledge, the toxicological properties of this material have not been thoroughly investigated.

## SECTION 12. ECOLOGICAL INFORMATION

### Ecotoxicity

: The ecological characteristics of this product have not been fully investigated. The product should not be allowed to enter drains or water courses, or be deposited where it can affect ground or surface waters.

### Ecotoxicity data:

<u>Ingredients</u>	<u>CAS #</u>	<u>Toxicity to Fish</u>		
		<u>LC50 / 96h</u>	<u>NOEC / 21 day</u>	<u>M Factor</u>
Ammonium hydroxide	1336-21-6	8.2 mg/L (Fathead minnow)	N/Av	None.
Citric acid monohydrate	5949-29-1	N/Av	N/Av	None.

<u>Ingredients</u>	<u>CAS #</u>	<u>Toxicity to Daphnia</u>		
		<u>EC50 / 48h</u>	<u>NOEC / 21 day</u>	<u>M Factor</u>
Ammonium hydroxide	1336-21-6	0.66 mg/L (Daphnia magna)	N/Av	1
Citric acid monohydrate	5949-29-1	N/Av	N/Av	None.

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<u>Ingredients</u>	<u>CAS #</u>	<u>Toxicity to Algae</u>		
		<u>EC50 / 96h or 72h</u>	<u>NOEC / 96h or 72h</u>	<u>M Factor</u>
Ammonium hydroxide	1336-21-6	N/Av	N/Av	None.
Citric acid monohydrate	5949-29-1	N/Av	N/Av	None.

**Persistence and degradability**

: The methods for determining biodegradability are not applicable to inorganic substances.

**Bioaccumulation potential**

: No data is available on the product itself.

<u>Components</u>	<u>Partition coefficient n-octanol/water (log Kow)</u>	<u>Bioconcentration factor (BCF)</u>
Ammonium hydroxide (CAS 1336-21-6)	N/Av	N/Av
Citric acid monohydrate (CAS 5949-29-1)	N/Av	N/Av

**Mobility in soil**

: No data is available on the product itself.

**Other Adverse Environmental effects**

: No data is available on the product itself.

### SECTION 13. DISPOSAL CONSIDERATIONS

**Handling for Disposal**

: Handle waste according to recommendations in Section 7.

**Methods of Disposal**

: Dispose in accordance with all applicable federal, state, provincial and local regulations.

**RCRA**

: If this product, as supplied, becomes a waste in the United States, it may meet the criteria of a hazardous waste as defined under RCRA, Title 40 CFR 261. It is the responsibility of the waste generator to determine the proper waste identification and disposal method. For disposal of unused or waste material, check with local, state and federal environmental agencies.



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### SECTION 14. TRANSPORT INFORMATION

Regulatory Information	UN Number	UN proper shipping name	Transport hazard class(es)	Packing Group	Label
TDG	UN2672	AMMONIA SOLUTION	8	III	
<b>TDG Additional information</b>	May be shipped as a Limited Quantity when transported in containers no larger than 5 L (1.3 gallons); in packages not exceeding 30 kg (66 pounds) gross mass.				
49CFR/DOT	UN2672	AMMONIA SOLUTION	8	III	
<b>49CFR/DOT Additional information</b>	Refer to 49 CFR Section 173.154.				
ICAO/IATA	UN2672	Ammonia solution	8	III	
<b>ICAO/IATA Additional information</b>	Refer to ICAO/IATA Packing Instruction				
IMDG	UN2672	AMMONIA SOLUTION	8	III	
<b>IMDG Additional information</b>	Consult the IMDG regulations for exceptions.				

**Special precautions for user** : None reported by the manufacturer.

**Environmental hazards** : This product does not meet the criteria for an environmentally hazardous mixture, according to the IMDG Code. See ECOLOGICAL INFORMATION, Section 12.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**

: Not available.

### SECTION 15 - REGULATORY INFORMATION

#### US Federal Information:

Components listed below are present on the following U.S. Federal chemical lists:

Ingredients	CAS #	TSCA Inventory	CERCLA Reportable Quantity(RQ) (40 CFR 117.302):	SARA TITLE III: Sec. 302, Extremely Hazardous Substance, 40 CFR 355:	SARA TITLE III: Sec. 313, 40 CFR 372, Specific Toxic Chemical	
					Toxic Chemical	de minimus Concentration
Ammonium hydroxide	1336-21-6	Yes	1000 lb/ 454 kg	N/Ap	No	N/Ap
Citric acid monohydrate	5949-29-1	NL	N/Ap	N/Av	No	N/Ap

SARA TITLE III: Sec. 311 and 312, SDS Requirements, 40 CFR 370 Hazard Classes: Immediate (Acute) health hazard Under SARA Sections 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

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### US State Right to Know Laws:

The following chemicals are specifically listed by individual States:

<u>Ingredients</u>	CAS #	California Proposition 65		State "Right to Know" Lists					
		Listed	Type of Toxicity	CA	MA	MN	NJ	PA	RI
Ammonium hydroxide	1336-21-6	No	N/Ap	Yes	Yes	No	Yes	Yes	No
Citric acid monohydrate	5949-29-1	No	N/Ap	No	No	No	No	No	No

### Canadian Information:

WHMIS information: Refer to Section 2 for a WHMIS Classification for this product.

Canadian Environmental Protection Act (CEPA) information: All ingredients listed appear on the Domestic Substances List (DSL).

### International Information:

Components listed below are present on the following International Inventory list:

<u>Ingredients</u>	CAS #	European EINECs	Australia AICS	Philippines PICCS	Japan ENCS	Korea KECI/KECL	China IECSC	NewZealand IOC
Ammonium hydroxide	1336-21-6	215-647-6	Present	Present	(1)-314	KE-01688	Present	HSR001526, HSR001517, HSR001516, HSR001563 (dilution)
Citric acid monohydrate	5949-29-1	N/Av	Present	Present	(2)-1318	No data available.	Present	HSR003688

## SECTION 16. OTHER INFORMATION

### Legend

: ACGIH: American Conference of Governmental Industrial Hygienists  
 CA: California  
 CAS: Chemical Abstract Services  
 CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act of 1980  
 CFR: Code of Federal Regulations  
 CSA: Canadian Standards Association  
 DOT: Department of Transportation  
 EPA: Environmental Protection Agency  
 HMIS: Hazardous Materials Identification System  
 HSDB: Hazardous Substances Data Bank  
 IARC: International Agency for Research on Cancer  
 IATA: International Air Transport Association  
 ICAO: International Civil Aviation Organisation  
 IMDG: International Maritime Dangerous Goods  
 Inh: Inhalation  
 LC: Lethal Concentration  
 LD: Lethal Dose  
 MA: Massachusetts  
 MN: Minnesota  
 N/Ap: Not Applicable  
 N/Av: Not Available  
 NFPA: National Fire Protection Association  
 NIOSH: National Institute of Occupational Safety and Health

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NJ: New Jersey  
 NTP: National Toxicology Program  
 OSHA: Occupational Safety and Health Administration  
 PA: Pennsylvania  
 PEL: Permissible exposure limit  
 RCRA: Resource Conservation and Recovery Act  
 RI: Rhode Island  
 RTECS: Registry of Toxic Effects of Chemical Substances  
 SARA: Superfund Amendments and Reauthorization Act  
 STEL: Short Term Exposure Limit  
 TDG: Canadian Transportation of Dangerous Goods Act & Regulations  
 TLV: Threshold Limit Values  
 TWA: Time Weighted Average  
 WHMIS: Workplace Hazardous Materials Identification System

- References** :
1. ACGIH, Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices for 2018.
  2. International Agency for Research on Cancer Monographs, searched 2019.
  3. Canadian Centre for Occupational Health and Safety, CCIInfoWeb databases, 2019 (Chempendium, HSDB and RTECs).
  4. Safety Data Sheets from manufacturer.
  5. US EPA Title III List of Lists - June 2019 version.
  6. California Proposition 65 List - June 2019 version.
  7. OECD - The Global Portal to Information on Chemical Substances - eChemPortal, 2019.

**Preparation Date (mm/dd/yyyy)**

: 12/27/2015

**Reviewed Date SDS (dd/mm/yyyy)**

: 29/10/2019

**Revision No.**

: 2

**Revision Information**

: (M)SDS sections updated : All

**Other special considerations for handling**

: Provide adequate information, instruction and training for operators.

<p><b><u>Prepared for:</u></b>          Lowry &amp; Associates, Div. of Chem-Aquascience, Inc.          5-1151 Gorham Street          Newmarket, ON L3Y 8Y1  <a href="http://www.lowryassociates.ca">www.lowryassociates.ca</a></p>	
<p><b><u>Prepared by:</u></b>          ICC The Compliance Center Inc.          Telephone: (888) 442-9628 (U.S.): (888) 977-4834 (Canada)  <a href="http://www.thecompliancecenter.com">http://www.thecompliancecenter.com</a></p>	

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