

The tests that comprise the Freshwater Master Test Kit have changed, so this packet contains Material Safety Data Sheets that may not pertain to the kit in your possession.

# LIQUID NITRATE TEST SOLUTION #1

Chemwatch Material Safety Data Sheet  
Issue Date: 21-Oct-2005

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## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

### PRODUCT NAME

LIQUID NITRATE TEST SOLUTION #1

### STATEMENT OF HAZARDOUS NATURE

**CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.**

### SUPPLIER

Company: Aquarium Pharmaceuticals Incorporated  
Address:  
50 East Hamilton Street  
Chalfont  
PA, 18914  
USA  
Telephone: +1 215 822 8181

Company: Aquarium Pharmaceuticals Incorporated  
Address:  
PO Box 218  
Chalfont  
PA, 18914-0218  
USA  
Telephone: +1 215 822 8181  
Emergency Tel: +1800 222 1222 (US Only)

### PRODUCT USE

Nitrate test solution for product LR1800, 34 and 401M.

### SYNONYMS

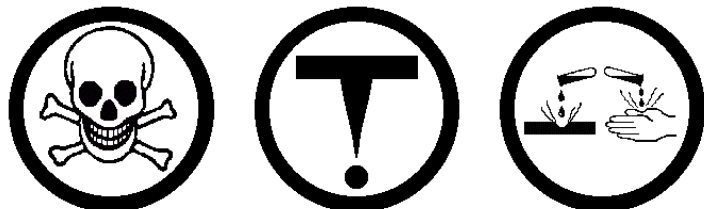
"Solution ID# 3306"

## Section 2 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
hydrochloric acid	7647-01-0	14 ap.
other ingredients, proprietary		N/S

## Section 3 - HAZARDS IDENTIFICATION

### CANADIAN WHMIS SYMBOLS



### EMERGENCY OVERVIEW

#### RISK

Harmful by inhalation.  
Irritating to eyes, respiratory system and skin.  
Cumulative effects may result following exposure\*.  
Eye contact may produce serious damage\*.

continued...

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Section 3 - HAZARDS IDENTIFICATION

Exposure may produce irreversible effects\*.

\*(limited evidence)

## POTENTIAL HEALTH EFFECTS

### ACUTE HEALTH EFFECTS

#### SWALLOWED

Ingestion of acidic corrosives may produce burns around and in the mouth, the throat and esophagus. Immediate pain and difficulties in swallowing and speaking may also be evident. Swelling of the epiglottis may make it difficult to breathe which may result in suffocation. More severe exposure may result in vomiting blood and thick mucus, shock, abnormally low blood pressure, fluctuating pulse, shallow respiration and clammy skin, inflammation of stomach wall, and rupture of esophageal tissue. Untreated shock may eventually result in kidney failure. Severe cases may result in perforation of the stomach and abdominal cavity with consequent infection, rigidity and fever. There may be severe narrowing of the esophageal or pyloric sphincters; this may occur immediately or after a delay of weeks to years. There may be coma and convulsions, followed by death due to infection of the abdominal cavity, kidneys or lungs.

#### EYE

This material can cause eye irritation and damage in some persons. If applied to the eyes, this material causes severe eye damage. Direct eye contact with acid corrosives may produce pain, tears, sensitivity to light and burns. Mild burns of the epithelia generally recover rapidly and completely. Severe burns produce long-lasting and possibly irreversible damage. The appearance of the burn may not be apparent for several weeks after the initial contact. The cornea may ultimately become deeply opaque resulting in blindness.

#### SKIN

Skin contact with acidic corrosives may result in pain and burns; these may be deep with distinct edges and may heal slowly with the formation of scar tissue. Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

#### INHALED

Inhalation of vapors or aerosols (mists, fumes), generated by the material

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Section 3 - HAZARDS IDENTIFICATION

during the course of normal handling, may be harmful.

There is some evidence to suggest that this material can cause, if inhaled once, irreversible damage of organs.

Corrosive acids can cause irritation of the respiratory tract, with coughing, choking and mucous membrane damage. There may be dizziness, headache, nausea and weakness. Swelling of the lungs can occur, either immediately or after a delay; symptoms of this include chest tightness, shortness of breath, frothy phlegm and cyanosis. Lack of oxygen can cause death hours after onset.

## CHRONIC HEALTH EFFECTS

Repeated or prolonged exposure to acids may result in the erosion of teeth, swelling and or ulceration of mouth lining. Irritation of airways to lung, with cough, and inflammation of lung tissue often occurs. Chronic exposure may inflame the skin or conjunctiva. Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure. There has been some concern that this material can cause cancer or mutations but there is not enough data to make an assessment.

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## Section 4 - FIRST AID MEASURES

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### SWALLOWED

- For advice, contact a Poisons Information Center or a doctor at once.
- Urgent hospital treatment is likely to be needed.
- If swallowed do NOT induce vomiting.
- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- Observe the patient carefully.
- Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.
- Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
- Transport to hospital or doctor without delay.

### EYE

If this product comes in contact with the eyes:

- Immediately hold eyelids apart and flush the eye continuously with running water.
- Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- Continue flushing until advised to stop by the Poisons Information Center or a doctor, or for at least 15 minutes.
- Transport to hospital or doctor without delay.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

### SKIN

If skin or hair contact occurs:

- Immediately flush body and clothes with large amounts of water, using safety shower if available.
- Quickly remove all contaminated clothing, including footwear.
- Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Center.
- Transport to hospital, or doctor.

continued...

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Section 4 - FIRST AID MEASURES

## INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Lay patient down. Keep warm and rested.
- Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
- Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
- Transport to hospital, or doctor, without delay.

## NOTES TO PHYSICIAN

- For acute or short term repeated exposures to strong acids:
- Airway problems may arise from laryngeal edema and inhalation exposure. Treat with 100% oxygen initially.
  - Respiratory distress may require cricothyroidotomy if endotracheal intubation is contraindicated by excessive swelling
  - Intravenous lines should be established immediately in all cases where there is evidence of circulatory compromise.
  - Strong acids produce a coagulation necrosis characterized by formation of a coagulum (eschar) as a result of the dessicating action of the acid on proteins in specific tissues.

## INGESTION:

- Immediate dilution (milk or water) within 30 minutes post ingestion is recommended.
- DO NOT attempt to neutralize the acid since exothermic reaction may extend the corrosive injury.
- Be careful to avoid further vomit since re-exposure of the mucosa to the acid is harmful. Limit fluids to one or two glasses in an adult.
- Charcoal has no place in acid management.
- Some authors suggest the use of lavage within 1 hour of ingestion.

## SKIN:

- Skin lesions require copious saline irrigation. Treat chemical burns as thermal burns with non-adherent gauze and wrapping.
- Deep second-degree burns may benefit from topical silver sulfadiazine.

## EYE:

- Eye injuries require retraction of the eyelids to ensure thorough irrigation of the conjunctival cul-de-sacs. Irrigation should last at least 20-30 minutes. DO NOT use neutralizing agents or any other additives. Several liters of saline are required.
  - Cycloplegic drops, (1% cyclopentolate for short-term use or 5% homatropine for longer term use) antibiotic drops, vasoconstrictive agents or artificial tears may be indicated dependent on the severity of the injury.
  - Steroid eye drops should only be administered with the approval of a consulting ophthalmologist).
- [Ellenhorn and Barceloux: Medical Toxicology].

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## Section 5 - FIRE FIGHTING MEASURES

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Flash Point (°F): Not Applicable  
Lower Explosive Limit (%): Not Applicable  
Upper Explosive Limit (%): Not Applicable  
Autoignition Temp (°F): Not Applicable

continued...

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Section 5 - FIRE FIGHTING MEASURES

## EXTINGUISHING MEDIA

- Water spray or fog.
- Foam.
- Dry chemical powder.
- BCF (where regulations permit).
- Carbon dioxide.

## FIRE FIGHTING

- Alert Emergency Responders and tell them location and nature of hazard.
  - Wear full body protective clothing with breathing apparatus.
  - Prevent, by any means available, spillage from entering drains or water course.
  - Use fire fighting procedures suitable for surrounding area.
  - DO NOT approach containers suspected to be hot.
  - Cool fire exposed containers with water spray from a protected location.
  - If safe to do so, remove containers from path of fire.
  - Equipment should be thoroughly decontaminated after use.
- When any large container (including road and rail tankers) is involved in a fire, consider evacuation by 2625 feet in all directions.

## GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

- Non combustible.
  - Not considered to be a significant fire risk.
  - Acids may react with metals to produce hydrogen, a highly flammable and explosive gas.
  - Heating may cause expansion or decomposition leading to violent rupture of rigid containers.
  - May emit corrosive, poisonous fumes. May emit acrid smoke.
- Decomposition may produce toxic fumes of, hydrogen chloride.

## FIRE INCOMPATIBILITY

None known.

## PERSONAL PROTECTION

- Glasses:  
Full face- shield.
- Gloves:  
PE/EVAL/PE Gloves.
- Respirator:  
Type B-P Filter of sufficient capacity

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## Section 6 - ACCIDENTAL RELEASE MEASURES

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### MINOR SPILLS

- Clean up all spills immediately.
- Avoid breathing vapors and contact with skin and eyes.
- Control personal contact by using protective equipment.
- Contain and absorb spill with sand, earth, inert material or vermiculite.
- Wipe up.
- Place in a suitable labeled container for waste disposal.

### MAJOR SPILLS

- Clear area of personnel and move upwind.
- Alert Emergency Responders and tell them location and nature of hazard.

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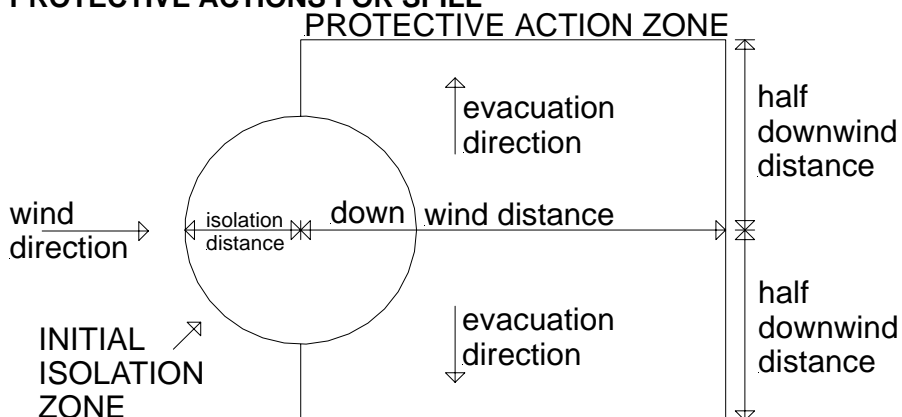
## Section 6 - ACCIDENTAL RELEASE MEASURES

- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Consider evacuation.
- Stop leak if safe to do so.
- Contain spill with sand, earth or vermiculite.
- Collect recoverable product into labeled containers for recycling.
- Neutralize/decontaminate residue.
- Collect solid residues and seal in labeled drums for disposal.
- Wash area and prevent runoff into drains.
- After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.
- If contamination of drains or waterways occurs, advise emergency services.

### EMERGENCY EXPOSURE LIMITS

Material	Revised IDLH Value (ppm)	Revised IDLH Value (mg/m <sup>3</sup> )
Hydrogen chloride	50	

### PROTECTIVE ACTIONS FOR SPILL



From IERG (Canada/Australia)

Isolation Distance	25 meters
Downwind Protection Distance	250 meters

### FOOTNOTES

- 1 PROTECTIVE ACTION ZONE is defined as the area in which people are at risk of harmful exposure. This zone assumes that random changes in wind direction confines the vapour plume to an area within 30 degrees on either side of the predominant wind direction, resulting in a crosswind protective action distance equal to the downwind protective action distance.
- 2 PROTECTIVE ACTIONS should be initiated to the extent possible, beginning with those closest to the spill and working away from the site in the downwind direction. Within the protective action zone a level of vapour concentration may exist resulting in nearly all unprotected persons becoming incapacitated and unable to take protective action and/or incurring serious or irreversible health effects.
- 3 INITIAL ISOLATION ZONE is determined as an area, including upwind of the incident, within which a high probability of localised wind reversal may expose nearly all persons without appropriate protection to life-threatening concentrations of the material.
- 4 SMALL SPILLS involve a leaking package of 200 litres (55 US gallons) or less, such as a drum (jerrican or box with inner containers). Larger packages leaking

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## Section 6 - ACCIDENTAL RELEASE MEASURES

less than 200 litres and compressed gas leaking from a small cylinder are also considered "small spills".

LARGE SPILLS involve many small leaking packages or a leaking package of greater than 200 litres, such as a cargo tank, portable tank or a "one-tonne" compressed gas cylinder.

5 Guide 154 is taken from the US DOT emergency response guide book.

6 IERG information is derived from CANUTEC - Transport Canada.

### ACUTE EXPOSURE GUIDELINE LEVELS (AEGL) (in ppm)

AEGL Type	5 min	10 min	30 min	60 min	4 hr	8 hr
AEGL 1		1.8	1.8	1.8	1.8	1.8
AEGL 2		100	43	22	11	11
AEGL 3		620	210	100	26	26

AEGL 1: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure.

AEGL 2: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.

AEGL 3: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience life-threatening health effects or death.

### EMERGENCY RESPONSE PLANNING GUIDELINES (ERPG)

The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour WITHOUT experiencing or developing

life-threatening health effects is:

hydrochloric acid 150 ppm

irreversible or other serious effects or symptoms which could impair an individual's ability to take protective action is:

hydrochloric acid 20 ppm

other than mild, transient adverse effects without perceiving a clearly defined odour is:

hydrochloric acid 3 ppm

The threshold concentration below which most people will experience no appreciable risk of health effects:

hydrochloric acid 0.5 ppm

American Industrial Hygiene Association (AIHA)

Ingredients considered according exceed the following cutoffs

Very Toxic (T+)  $\geq$  0.1% Toxic (T)  $\geq$  3.0%

R50  $\geq$  0.25% Corrosive (C)  $\geq$  5.0%

R51  $\geq$  2.5%

else  $\geq$  10%

where percentage is percentage of ingredient found in the mixture

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## Section 7 - HANDLING AND STORAGE

### PROCEDURE FOR HANDLING

- Avoid all personal contact, including inhalation.
  - Wear protective clothing when risk of exposure occurs.
  - Use in a well-ventilated area.
  - WARNING: To avoid violent reaction, ALWAYS add material to water and NEVER water to material.
  - Avoid smoking, naked lights or ignition sources.
  - Avoid contact with incompatible materials.
  - When handling, DO NOT eat, drink or smoke.
  - Keep containers securely sealed when not in use.
  - Avoid physical damage to containers.
  - Always wash hands with soap and water after handling.
  - Work clothes should be laundered separately.
  - Launder contaminated clothing before re-use.
  - Use good occupational work practice.
  - Observe manufacturer's storing and handling recommendations.
  - Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.
- DO NOT allow clothing wet with material to stay in contact with skin.

### RECOMMENDED STORAGE METHODS

- DO NOT use aluminum or galvanized containers.
- Check regularly for spills and leaks.

### STORAGE REQUIREMENTS

- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storing and handling recommendations.

## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

### EXPOSURE CONTROLS

US OSHA Permissible Exposure Levels (PELs)

Z	Material	TWA ppm	TWA mg/m <sup>3</sup>	STEL ppm	STEL mg/m <sup>3</sup>	Peak ppm	Peak mg/m <sup>3</sup>	Max excursion ppm	Max excursion mg/m <sup>3</sup>	Max excursion duration (mins)
Z1	Hydrogen chloride					5	7			

Source	Material	TWA ppm	TWA mg/m <sup>3</sup>	STEL ppm	STEL mg/m <sup>3</sup>	Peak ppm	Peak mg/m <sup>3</sup>
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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

US California Permissible Exposure Limits for Chemical Contaminants	Hydrogen chloride; muriatic acid	5	7		
US Minnesota Permissible Exposure Limits (PELs)	Hydrogen chloride	5	7		
US Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants	Hydrogen chloride	(C)5	(C)7		
US Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	Hydrogen chloride	5	7		
US Tennessee Occupational Exposure Limits - Limits For Air Contaminants	Hydrogen chloride	5	7		
US Idaho - Limits for Air Contaminants	Hydrogen chloride	5	7		
Canada Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	Hydrogen chloride				7.50000
Canada Yukon Permissible Concentrations for Airborne Contaminant Substances	Hydrogen chloride	5	7	-	-
US Washington Permissible exposure limits of air contaminants	Hydrogen chloride				5.0
Canadian British Columbia Occupational Exposure Limits (Revised 2003)	Hydrogen chloride				2
NIOSH Recommended Exposure Limits for Hazardous Agents in the Workplace	Hydrogen chloride				5
US California Permissible Exposure Limits for Chemical Contaminants	Hydrogen chloride; muriatic acid	5	7		
US Minnesota Permissible Exposure Limits (PELs)	Hydrogen chloride	5	7		
US Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants	Hydrogen chloride	(C)5	(C)7		
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US Tennessee Occupational Exposure Limits - Limits For Air Contaminants	Hydrogen chloride	5	7		
US Idaho - Limits for Air Contaminants	Hydrogen chloride	5	7		
Canada Saskatchewan Occupational Health and	Hydrogen chloride				7.50000

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

### Safety Regulations -

#### Contamination Limits

Canada Yukon Permissible Concentrations for Airborne Contaminant Substances	Hydrogen chloride	5	7	-	-
US Washington Permissible exposure limits of air contaminants	Hydrogen chloride				5.0
Canadian British Columbia Occupational Exposure Limits	Hydrogen chloride (Revised 2003)				2
NIOSH Recommended Exposure Limits for Hazardous Agents in the Workplace	Hydrogen chloride				5

### ODOUR SAFETY FACTOR (OSF)

OSF=1.3 (hydrochloric acid)

Exposed individuals are NOT reasonably expected to be warned, by smell, that the Exposure Standard is being exceeded.

Odor Safety Factor (OSF) is determined to fall into either Class C, D or E.

The Odor Safety Factor (OSF) is defined as:

OSF= Exposure Standard (TWA) ppm/ Odor Threshold Value (OTV) ppm

Classification into classes follows:

Class	OSF	Description
A	550	Over 90% of exposed individuals are aware by smell that the Exposure Standard (TLV-TWA for example) is being reached, even when distracted by working activities
B	26-550	Idem for 50-90% of persons being distracted
C	1-26	Idem for less than 50% of persons being distracted
D	0.18-1	0-50% of persons aware of being tested perceive by smell that the Exposure Standard is being reached
E	<0.18	Idem for less than 10% of persons aware of being tested

Amoore and Hautala \* have determined that it is only at an OSF value of 26 that 50% of distracted persons can detect the substance at the Exposure Standard value. In the case of alerted persons, an OSF of 26 means that 99% of them can detect the odor at the Exposure Standard value. It is ONLY for substances belonging to Class A and B that there is a reasonable chance of being warned in time, that the Exposure Standard is being exceeded. \* Journal Applied Toxicology: Vol 3, 1983, p272

NOTE: The use of the OSF may be inappropriate for mixtures where substances mask the odor of others.

continued...

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

### INGREDIENT DATA

#### HYDROCHLORIC ACID:

Odour Threshold Value: 0.262 ppm (detection), 10.06 ppm (recognition)

NOTE: Detector tubes for hydrochloric acid, measuring in excess of 1 ppm, are available commercially.

Hydrogen chloride is a strong irritant to the eyes, mucous membranes and skin. Chronic exposure produces a corrosive action on the teeth. Reports of respiratory irritation following short-term exposure at 5 ppm have led to the recommended TLV-C. There is no indication that skin contact with hydrogen chloride elicits systemic poisoning and a skin designation has not been applied.

Exposure of humans to hydrogen chloride at 50 to 100 ppm for 1 hour is reported to be barely tolerable; 35 ppm caused irritation of the throat on short exposure and 10 ppm was the maximal concentration for prolonged exposure. It has been stated that hydrogen chloride at concentrations of 5 ppm is immediately irritating.

-  
Toxic effects of hydrochloric acid

Concentration	Clinical effects
0.067 - 0.267 ppm	Reported range of odour thresholds and changes in respiratory pattern
5 ppm	No organic damage
10 ppm	Irritation; work undisturbed
10-50 ppm	Work difficult but possible
35 ppm	Short exposure irritation of the throat
50-100 ppm	Exposure for 1 h barely tolerable
1000-2000 ppm	Brief exposure dangerous; laryngospasm
1300-2000 ppm	Lethal after a few minutes

### PERSONAL PROTECTION

#### EYE

- Chemical goggles.
- Full face shield.
- Contact lenses pose a special hazard; soft contact lenses may absorb irritants and all lenses concentrate them.

#### HANDS/FEET

Elbow length PVC gloves.

When handling corrosive liquids, wear trousers or overalls outside of boots, to avoid spills entering boots.

#### OTHER

- Overalls.
- PVC Apron.
- PVC protective suit may be required if exposure severe.
- Eyewash unit.
- Ensure there is ready access to a safety shower.

#### RESPIRATOR

Selection of the Class and Type of respirator will depend upon the level of breathing zone contaminant and the chemical nature of the contaminant.

Protection Factors (defined as the ratio of contaminant outside and inside the

continued...

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

mask) may also be important.

Breathing Zone Level ppm (volume)	Maximum Protection Factor	Half-face Respirator	Full-Face Respirator
1000	10	B-1 P	-
1000	50	-	B-1 P
5000	50	Airline*	-
5000	100	-	B-2 P
10000	100	-	B-3 P
	100+		Airline* *

\* - Continuous Flow \*\* - Continuous-flow or positive pressure demand.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.

Use appropriate NIOSH-certified respirator based on informed professional judgement. In conditions where no reasonable estimate of exposure can be made, assume the exposure is in a concentration IDLH and use NIOSH-certified full face pressure demand SCBA with a minimum service life of 30 minutes, or a combination full facepiece pressure demand SAR with auxiliary self-contained air supply. Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.

## ENGINEERING CONTROLS

Local exhaust ventilation usually required. If risk of overexposure exists, wear an approved respirator. Correct fit is essential to obtain adequate protection an approved self contained breathing apparatus (SCBA) may be required in some situations. Provide adequate ventilation in warehouse or closed storage area.

## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

### PHYSICAL PROPERTIES

Liquid.  
Mixes with water.  
Corrosive.  
Acid.

Molecular Weight: Not Applicable  
Melting Range (°C): Not Available  
Solubility in water (g/L): Miscible  
pH (1% solution): Not Available  
Volatile Component (%vol): Not Available  
Relative Vapor Density (air=1): Not Available  
Lower Explosive Limit (%): Not Applicable  
Autoignition Temp (°C): Not Applicable  
State: Liquid

Boiling Range (°C): Not Available  
Specific Gravity (water=1): 1.155  
pH (as supplied): <1  
Vapor Pressure (kPa): Not Available  
Evaporation Rate: Not Available  
Flash Point (°C): Not Applicable  
Upper Explosive Limit (%): Not Applicable  
Decomposition Temp (°C): Not Available

### APPEARANCE

Yellow-orange highly acidic liquid with no odour; mixes with water.

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## Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

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### CONDITIONS CONTRIBUTING TO INSTABILITY

Contact with alkaline material liberates heat.

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerization will not occur.

### STORAGE INCOMPATIBILITY

Segregate from alkalis, oxidizing agents and chemicals readily decomposed by acids, i.e. cyanides, sulfides, carbonates.

Reacts with mild steel, galvanised steel / zinc producing hydrogen gas which may form an explosive mixture with air.

Avoid strong bases.

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## Section 11 - TOXICOLOGICAL INFORMATION

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### Liquid Nitrate Test Solution #1

Not available. Refer to individual constituents.

unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances

#### HYDROCHLORIC ACID:

##### TOXICITY

Unreported (man) LDLo: 81 mg/kg

Inhalation (human) LCLo: 1300 ppm/30 min

Inhalation (human) LCLo: 3000 ppm/5 min

Inhalation (rat) LC50: 3124 ppm/1h

Oral (rat) LD50: 900 mg/kg

The substance is classified by IARC as Group 3:

NOT classifiable as to its carcinogenicity to humans.

Evidence of carcinogenicity may be inadequate or limited in animal testing.

##### IRRITATION

Eye (rabbit): 5mg/30s - mild

##### MATERIAL

##### CARCINOGEN

##### SENSITIZER SKIN

##### MUTAGEN

##### REPROTOXIN

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Liquid Nitrate Test Solution

#1

hydrochloric acid

Listed

##### CARCINOGEN

ACGIH: hydrochloric acid: A4

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## Section 12 - ECOLOGICAL INFORMATION

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Prevent, by any means available, spillage from entering drains or water courses.

DO NOT discharge into sewer or waterways.

Refer to data for ingredients, which follows:

#### HYDROCHLORIC ACID:

Hazardous Air Pollutant: Yes

Fish LC50 (96hr.) (mg/l): 0.282

continued...

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Section 12 - ECOLOGICAL INFORMATION

## Ecotoxicity

Fish LC100 (24 h): trout 10 mg/l

TLm (96 h): mosquito fish 282 ppm (fresh water)

LC50 : goldfish 178 mg/l

Shrimp LC50 (48 h): 100 - 330 ppm (salt water)

Starfish LC50 (48 h): 100 - 330 mg/l

Cockle LC50 (48 h): 330 - 1000 mg/l

[Hach]

Hydrogen chloride in water dissociates almost completely, releasing hydrogen and chloride ions; the hydrogen ions are captured by water to produce hydronium ions.

Hydrochloric acid infiltrates soil, the rate dependent on moisture content. During soil transport, hydrochloric acid dissolves soil components.

Drinking water standard:

chloride: 400 mg/l (UK max.)

250 mg/l (WHO guideline)

DO NOT discharge into sewer or waterways.

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## Section 13 - DISPOSAL CONSIDERATIONS

---

### US EPA Waste Number & Descriptions

A. General Product Information

Corrosivity characteristic: use EPA hazardous waste number D002 (waste code C)

### Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.

- Recycle wherever possible.

- Consult manufacturer for recycling options or consult Waste Management Authority for disposal if no suitable treatment or disposal facility can be identified.

- Treat and neutralize at an approved treatment plant. Treatment should involve:

Neutralization with soda-ash or soda-lime followed by:

- Burial in a licensed land-fill or Incineration in a licensed apparatus (after admixture with suitable combustible material).

- Decontaminate empty containers with 5% aqueous sodium hydroxide or soda ash, followed by water. Observe all label safeguards until containers are cleaned and destroyed.

Puncture containers to prevent re-use and bury at an authorized landfill.

---

## Section 14 - TRANSPORTATION INFORMATION

---

Shipping Name: CORROSIVE LIQUID, ACIDIC,  
INORGANIC, N.O.S.

Hazard Class: 8

SubRisk: None

UN/NA Number: 3264

Packing Group: II

Labels Required: corrosive

Additional Shipping Information:

continued...

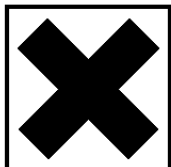
# LIQUID NITRATE TEST SOLUTION #1

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Section 14 - TRANSPORTATION INFORMATION

International Transport Regulations:  
IMO: 8

## Section 15 - REGULATORY INFORMATION



### RISK

Harmful by inhalation.  
Irritating to eyes, respiratory system and skin.

### US Federal Regulations

#### A. General Product Information

In addition to Federal and State regulation, local regulations may apply. Check with your local regulatory authorities.

#### B. Component Information

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 455 Appendix A) SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4):

-----  
hydrochloric acid (7647-01-0,14ap.% )  
SARA 313: form R reporting required for 1.0% de minimus concentration

CERCLA: final RQ = 5000 pounds (2270 kg)  
-----

Component	TSCA
hydrochloric acid	Y

### State Regulations

#### A. General Product Information

#### B. Component Information

The following components appear on one or more of the following state hazardous substance lists.

Component	CAS No	CA	FL	MA	MN	NJ	PA
hydrochloric acid	7647-01-0	Y	Y	Y	Y	Y	Y

Y=Yes this material appears on that state's hazardous substances list.

N=No this material does not appear on that state's hazardous substances list.

### Other Regulations

#### A. Component Information

CANADA

The following component(s) are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

continued...

# LIQUID NITRATE TEST SOLUTION #1

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Section 15 - REGULATORY INFORMATION

Component	CAS No	%	Min Conc.
hydrochloric acid	7647-01-0	14 ap.	1% item 845 (502)

All of this product's components are on the Canadian Domestic

## REGULATIONS

hydrochloric acid (CAS: 7647-01-0) is found on the following regulatory lists

- Canadian Domestic Substances List (DSL)
- US Toxic Substances Control Act (TSCA)
- US ACGIH Carcinogens Listing
- US SARA Section 302 Extremely Hazardous Substances
- Canada Prohibited Toxic Substances, Schedule 2, Concentration Limits (English)
- Canada Prohibited Toxic Substances - Schedule 2: Concentration Limits (French)
- US OSHA List of Highly Hazardous Chemicals, Toxics and Reactives
- US EPA Hazardous Substances
- US California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List
- US CERCLA List of Hazardous Substances and Reportable Quantities
- US CWA (Clean Water Act) - List of Hazardous Substances
- US CWA (Clean Water Act) - Reportable Quantities of Designated Hazardous Substances
- US Minnesota Hazardous Substance List
- US Oregon Hazardous Materials
- US EPA High Production Volume Chemicals Additional List
- US EPCRA Section 313 Chemical List For Reporting Year 2004
- US Food Additive Database
- US EPA List of Regulated Toxic Substances and Threshold Quantities for Accidental Release Prevention
- Canada Yukon Permissible Concentrations for Airborne Contaminant Substances
- US Connecticut Hazardous Air Pollutants
- Canadian Ingredient Disclosure List (SOR/88-64)
- US EPA High Production Volume Program Chemical List

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## Section 16 - OTHER INFORMATION

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# LIQUID NITRATE TEST SOLUTION #2

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## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

### PRODUCT NAME

LIQUID NITRATE TEST SOLUTION #2

### STATEMENT OF HAZARDOUS NATURE

**CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.**

### SUPPLIER

Company: Aquarium Pharmaceuticals Incorporated  
Address:  
50 East Hamilton Street  
Chalfont  
PA, 18914  
USA  
Telephone: +1 215 822 8181

Company: Aquarium Pharmaceuticals Incorporated  
Address:  
PO Box 218  
Chalfont  
PA, 18914-0218  
USA  
Telephone: +1 215 822 8181  
Emergency Tel: +1800 222 1222 (US Only)

### PRODUCT USE

Nitrate test solution for product LR1800, 34 and 401M.

### SYNONYMS

"Solution ID# 3307"

## Section 2 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
polyethylene glycol	25322-68-3	98
sulfanilamide	63-74-1	<5

## Section 3 - HAZARDS IDENTIFICATION

### CANADIAN WHMIS SYMBOLS



### EMERGENCY OVERVIEW

#### RISK

Exposure may produce irreversible effects\*.  
May affect fertility\*.  
May possibly be harmful to the fetus/ embryo\*.  
May produce discomfort of the eyes, respiratory tract and skin\*.

\*(limited evidence)

continued...

# LIQUID NITRATE TEST SOLUTION #2

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Section 3 - HAZARDS IDENTIFICATION

## POTENTIAL HEALTH EFFECTS

### ACUTE HEALTH EFFECTS

#### SWALLOWED

The material has NOT been classified as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence. The material may still be damaging to the health of the individual, following ingestion, especially where pre-existing organ (e.g. liver, kidney) damage is evident. Present definitions of harmful or toxic substances are generally based on doses producing mortality (death) rather than those producing morbidity (disease, ill-health). Gastrointestinal tract discomfort may produce nausea and vomiting. In an occupational setting however, unintentional ingestion is not thought to be cause for concern.

#### EYE

There is some evidence to suggest that this material can cause eye irritation and damage in some persons. Limited evidence or practical experience suggests, that the material may cause eye irritation in a substantial number of individuals. Prolonged eye contact may cause inflammation characterized by a temporary redness of the conjunctiva (similar to windburn). Eye drops with sulfonamides can cause local irritation, sensations of burning and stinging, blurred vision and loss of depth perception. The conjunctiva and cornea may become inflamed, and the cornea and lens may become clouded.

#### SKIN

There is some evidence to suggest that this material can cause inflammation of the skin on contact in some persons. Skin contact is not thought to have harmful health effects, however the material may still produce health damage following entry through wounds, lesions or abrasions. There is some evidence to suggest that the material may cause mild but significant inflammation of the skin either following direct contact or after a delay of some time. Repeated exposure can cause contact dermatitis which is characterized by redness, swelling and blistering. Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

#### INHALED

There is some evidence to suggest that this material, if inhaled, can irritate the throat and lungs of some persons. Although inhalation is not thought to produce harmful effects, the material may still produce health damage, especially where pre-existing organ (e.g. liver, kidney) damage is evident. Present definitions of harmful or toxic substances are generally confined to doses producing mortality (death) rather than those producing morbidity (disease, ill-health). There is some evidence to suggest that the material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage. Not normally a hazard due to non-volatile nature of product.

### CHRONIC HEALTH EFFECTS

There has been some concern that this material can cause cancer or mutations but

continued...

# LIQUID NITRATE TEST SOLUTION #2

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Section 3 - HAZARDS IDENTIFICATION

there is not enough data to make an assessment. There is some evidence to provide a presumption that human exposure to the material may result in impaired fertility on the basis of: some evidence in animal studies of impaired fertility in the absence of toxic effects, or evidence of impaired fertility occurring at around the same dose levels as other toxic effects but which is not a secondary non-specific consequence of other toxic effects. Prolonged oral treatment with sulfonamides has caused nausea, vomiting, diarrhea, abdominal pain, loss of appetite, inflammation of the mouth cavity, impaired folic acid absorption, exacerbation of porphyria, acidosis, liver damage with impaired blood clotting, jaundice and inflammation of the pancreas. Effects on the kidney include blood and crystals in the urine, painful and frequent urination or lack of urine with nitrogen retention. Nervous system symptoms include headache, drowsiness, trouble sleeping, dizziness, ringing in the ears, hearing loss, depression, hallucinations, inco-ordination, paralysis of muscles, numbness in the extremities, spinal cord damage and inflammation, convulsions and unconsciousness. Effects on the blood includes a change in blood cell distribution with loss of white blood cells and platelets, and anemia, which Africans seem to be more prone to developing than Europeans. Cyanosis can occur owing to complexes being formed by hemoglobin. Eye effects include inflamed cornea and conjunctiva with eyelid swelling and in severe cases, fear of the light. Allergies and cross-sensitivity is common, and can cause itches, wheals and sometimes a severe red rash with blisters that is often fatal. This class of drugs can scar the cornea and conjunctiva, swelling around the eyes, painful and inflamed joints, reduced sperm counts, pneumonia, fever, chills, hair loss, inflammation of vessels, lupus, reduced lung function, infertility, hypothyroidism and goiter, and increased urinary output. More seriously, the lungs may become permanently scarred and there may be irreversible damage to the nervous system and muscles. Inflammation of the skin has occurred after the drug is ingested and has traveled through the bloodstream. Skin effects often occur when there has been exposure in conjunction with UV light. Clothed areas are initially less likely to be affected but may be in later stages. Rarely there may be persistence of inflammation on light contact even after the drug has been removed.

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## Section 4 - FIRST AID MEASURES

---

### SWALLOWED

- Immediately give a glass of water.
- First aid is not generally required. If in doubt, contact a Poisons Information Center or a doctor.

### EYE

If this product comes in contact with the eyes:

- Wash out immediately with fresh running water.
- Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- If pain persists or recurs seek medical attention.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

### SKIN

If skin contact occurs:

- Immediately remove all contaminated clothing, including footwear
- Flush skin and hair with running water (and soap if available).

continued...

# LIQUID NITRATE TEST SOLUTION #2

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Section 4 - FIRST AID MEASURES

- Seek medical attention in event of irritation.

## INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Other measures are usually unnecessary.

## NOTES TO PHYSICIAN

Treat symptomatically.

In cases of recent sulfonamide overdose the stomach should be emptied by aspiration and lavage. If kidney function is adequate, a saline purgative, such as sodium sulfate, 30 g in 250 ml water, may be given to promote peristalsis and elimination of sulfonamide in the urine may be assisted by giving alkalis, such as sodium bicarbonate and increasing fluid intake. Severe crystalluria may require ureteric catheterization and irrigation with warm 2.5% sodium bicarbonate solution. Treatment should be continued until it can be assumed that the sulfonamide has been eliminated. The majority of sulfonamides are metabolized to acetylated derivatives which retain the toxicity of the parent compound and thus may indicate more active removal when adverse effects are very severe. Active measures may include forced diuresis, peritoneal dialysis and charcoal hemoperfusion.

[Martindale: The Extra Pharmacopoeia, 28th Ed.].

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## Section 5 - FIRE FIGHTING MEASURES

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Flash Point (°F): Not Applicable  
Lower Explosive Limit (%): Not Applicable  
Upper Explosive Limit (%): Not Applicable  
Autoignition Temp (°F): Not Applicable

### EXTINGUISHING MEDIA

- Water spray or fog.
- Foam.
- Dry chemical powder.
- BCF (where regulations permit).
- Carbon dioxide.

### FIRE FIGHTING

- Alert Emergency Responders and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Use water delivered as a fine spray to control fire and cool adjacent area.
- Avoid spraying water onto liquid pools.
- Do not approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.

### GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

- Combustible.
- Slight fire hazard when exposed to heat or flame.
- Heating may cause expansion or decomposition leading to violent rupture of containers.
- On combustion, may emit toxic fumes of carbon monoxide (CO).
- May emit acrid smoke.
- Mists containing combustible materials may be explosive.

continued...

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Section 5 - FIRE FIGHTING MEASURES

Combustion products include, carbon dioxide (CO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), sulfur oxides (SO<sub>x</sub>), other pyrolysis products typical of burning organic material.

May emit poisonous fumes.

May emit corrosive fumes.

## FIRE INCOMPATIBILITY

Avoid contamination with oxidizing agents i.e. nitrates, oxidizing acids, chlorine bleaches, pool chlorine etc. as ignition may result.

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## Section 6 - ACCIDENTAL RELEASE MEASURES

---

### MINOR SPILLS

- Remove all ignition sources.
- Clean up all spills immediately.
- Avoid breathing vapors and contact with skin and eyes.
- Control personal contact by using protective equipment.
- Contain and absorb spill with sand, earth, inert material or vermiculite.
- Wipe up.
- Place in a suitable labeled container for waste disposal.

### MAJOR SPILLS

Moderate hazard.

- Clear area of personnel and move upwind.
- Alert Emergency Responders and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or water course.
- No smoking, naked lights or ignition sources. Increase ventilation.
- Stop leak if safe to do so.
- Contain spill with sand, earth or vermiculite.
- Collect recoverable product into labeled containers for recycling.
- Absorb remaining product with sand, earth or vermiculite.
- Collect solid residues and seal in labeled drums for disposal.
- Wash area and prevent runoff into drains.
- If contamination of drains or waterways occurs, advise emergency services.

## ACUTE EXPOSURE GUIDELINE LEVELS (AEGLE) (in ppm)

AEGLE 1: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure.

AEGLE 2: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.

AEGLE 3: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience life-threatening health effects or death.

continued...

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## Section 6 - ACCIDENTAL RELEASE MEASURES

### EMERGENCY RESPONSE PLANNING GUIDELINES (ERPG)

The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour WITHOUT experiencing or developing

life-threatening health effects is:

polyethylene glycol 500 mg/m<sup>3</sup>

irreversible or other serious effects or symptoms which could impair an individual's ability to take protective action is:

polyethylene glycol 50 mg/m<sup>3</sup>

other than mild, transient adverse effects without perceiving a clearly defined odour is:

polyethylene glycol 30 mg/m<sup>3</sup>

The threshold concentration below which most people will experience no appreciable risk of health effects:

polyethylene glycol 10 mg/m<sup>3</sup>

American Industrial Hygiene Association (AIHA)

Ingredients considered according exceed the following cutoffs

Very Toxic (T+) >= 0.1%	Toxic (T) >= 3.0%
R50 >= 0.25%	Corrosive (C) >= 5.0%
R51 >= 2.5%	
else >= 10%	

where percentage is percentage of ingredient found in the mixture

## Section 7 - HANDLING AND STORAGE

### PROCEDURE FOR HANDLING

DO NOT USE brass or copper containers / stirrers.

- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- Prevent concentration in hollows and sumps.
- DO NOT enter confined spaces until atmosphere has been checked.
- Avoid smoking, naked lights or ignition sources.
- Avoid contact with incompatible materials.
- When handling, DO NOT eat, drink or smoke.
- Keep containers securely sealed when not in use.
- Avoid physical damage to containers.
- Always wash hands with soap and water after handling.
- Work clothes should be laundered separately.
- Use good occupational work practice.
- Observe manufacturer's storing and handling recommendations.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions.

DO NOT allow clothing wet with material to stay in contact with skin.

### RECOMMENDED STORAGE METHODS

- Metal can or drum
- Packing as recommended by manufacturer.
- Check all containers are clearly labeled and free from leaks.

continued...

# LIQUID NITRATE TEST SOLUTION #2

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Section 7 - HANDLING AND STORAGE

## STORAGE REQUIREMENTS

- Store in original containers.
- Keep containers securely sealed.
- No smoking, naked lights or ignition sources.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storing and handling recommendations.

## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

### EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m <sup>3</sup>	STEL ppm	STEL mg/m <sup>3</sup>	Peak ppm	Peak mg/m <sup>3</sup>
US AIHA Workplace Environmental Exposure Levels (WEELs)	Polyethylene Glycols		10				
No data available:	sulfanilamide as (CAS: 63-74-1)						

Not available. Refer to individual constituents.

### INGREDIENT DATA

#### POLYETHYLENE GLYCOL:

No exposure limits set by NOHSC or ACGIH.

For powdered forms:

Dusts not otherwise classified, as inspirable dust;

ES TWA: 10 mg/m<sup>3</sup>.

The polyethylene glycols are extremely low in oral toxicity, are not significantly irritating to the eyes or skin, and are not absorbed through the skin in toxic amounts. vapour pressures are extremely low and inhalation exposure is limited to mists. Based on experimental data and human experience, these substances do not present significant hazards to health in the workplace.

#### SULFANILAMIDE:

Dusts not otherwise classified, as inspirable dust;

ES TWA: 10 mg/m<sup>3</sup>.

Particulate (insoluble or poorly soluble \*) Not Otherwise Specified (P.N.O.C)

TLV TWA: 10 mg/m<sup>3</sup> Inhalable particulate

TLV TWA: 3 mg/m<sup>3</sup> Respirable particulate

OEL-Sweden, United Kingdom: 10 mg/m<sup>3</sup> total dust, 5 mg/m<sup>3</sup> respirable dust

These "dusts" have little adverse effect on the lungs and do not produce toxic effects or organic disease. Although there is no dust which does not evoke some cellular response at sufficiently high concentrations, the cellular response caused by P.N.O.C.s has the following characteristics:

- the architecture of the air spaces remain intact,
- scar tissue (collagen) is not synthesised to any degree,
- tissue reaction is potentially reversible.

Extensive concentrations of P.N.O.C.s may:

continued...

# LIQUID NITRATE TEST SOLUTION #2

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

- seriously reduce visibility,
- cause unpleasant deposits in the eyes, ears and nasal passages,
- contribute to skin or mucous membrane injury by chemical or mechanical action, per se, or by the rigorous skin cleansing procedures necessary for their removal. [ACGIH]

This limit does not apply:

- to brief exposures to higher concentrations
- nor does it apply to those substances that may cause physiological impairment at lower concentrations but for which a TLV has as yet to be determined.

This exposure standard applies to particles which

- are insoluble or poorly soluble\* in water or, preferably, in aqueous lung fluid (if data is available) and
- have a low toxicity (i.e.. are not cytotoxic, genotoxic, or otherwise chemically reactive with lung tissue, and do not emit ionizing radiation, cause immune sensitization, or cause toxic effects other than by inflammation or by a mechanism of lung overload)

\* Notice of intended change.

### PERSONAL PROTECTION

Glasses:

Chemical goggles.

Gloves:

PVC chemical resistant type.

Respirator:

### EYE

- Safety glasses with side shields.
- Chemical goggles.
- Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them. DO NOT wear contact lenses.

### HANDS/FEET

Wear chemical protective gloves, eg. PVC.

Wear safety footwear or safety gumboots, eg. Rubber.

### OTHER

- Overalls.
- P.V.C. apron.
- Barrier cream.
- Skin cleansing cream.
- Eye wash unit.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.

Use appropriate NIOSH-certified respirator based on informed professional judgement. In conditions where no reasonable estimate of exposure can be made, assume the exposure is in a concentration IDLH and use NIOSH-certified full face pressure demand SCBA with a minimum service life of 30 minutes, or a combination full facepiece pressure demand SAR with auxiliary self-contained air supply. Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.

continued...

# LIQUID NITRATE TEST SOLUTION #2

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

---

### ENGINEERING CONTROLS

General exhaust is adequate under normal operating conditions. Local exhaust ventilation may be required in special circumstances. If risk of overexposure exists, wear an approved respirator. An approved respirator (supplied air type) may be required in special circumstances. Correct fit is essential to ensure adequate protection. Provide adequate ventilation in warehouses and enclosed storage areas.

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## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

---

### PHYSICAL PROPERTIES

Liquid.  
Mixes with water.

Molecular Weight: Not Applicable  
Melting Range (°C): Not Available  
Solubility in water (g/L): Miscible  
pH (1% solution): Not Available  
Volatile Component (%vol): Not Available  
Relative Vapor Density (air=1): Not Available  
Lower Explosive Limit (%): Not Applicable  
Autoignition Temp (°C): Not Applicable  
State: Liquid

Boiling Range (°C): Not Available  
Specific Gravity (water=1): 1.127  
pH (as supplied): Not Available  
Vapor Pressure (kPa): Not Available  
Evaporation Rate: Not Available  
Flash Point (°C): Not Applicable  
Upper Explosive Limit (%): Not Applicable  
Decomposition Temp (°C): Not Available

### APPEARANCE

Translucent light gray liquid with no odor; mixes with water.

---

## Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

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### CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerization will not occur.

### STORAGE INCOMPATIBILITY

Avoid reaction with oxidizing agents.

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## Section 11 - TOXICOLOGICAL INFORMATION

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### Liquid Nitrate Test Solution #2

Not available. Refer to individual constituents.  
unless otherwise specified data extracted from RTECS - Register of Toxic Effects  
of Chemical Substances

### POLYETHYLENE GLYCOL:

#### TOXICITY

Oral (rat) LD50: 33750 mg/kg  
Eye (rabbit): 500mg/24h - mild.  
for molecular weights (200-8000) \*

#### IRRITATION

Skin (rabbit): 500mg/24h - mild.

continued...

# LIQUID NITRATE TEST SOLUTION #2

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## Section 11 - TOXICOLOGICAL INFORMATION

Oral (rat) LD50: 31000->50000 mg/kg  
Oral (mice) LD50: 38000->50000 mg/kg  
Oral (g.pig) LD50: 17000->50000 mg/kg  
Oral (rabbit) LD50: 14000->50000 mg/kg  
Intraperitoneal (mice) LD50: 3100-12900 mg/kg

\* AIHA WEEL Guides

### SULFANILAMIDE:

No significant acute toxicological data identified in literature search.

## Section 12 - ECOLOGICAL INFORMATION

DO NOT discharge into sewer or waterways.  
Refer to data for ingredients, which follows:

POLYETHYLENE GLYCOL:  
BOD 5 if unstated: 0-0.02,1%  
COD : 1.62-1.74,98%  
Toxicity Fish: TLm(96)>10000mg/L

## Section 13 - DISPOSAL CONSIDERATIONS

### Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.  
Puncture containers to prevent re-use and bury at an authorized landfill.

## Section 14 - TRANSPORTATION INFORMATION

DOT Information  
Shipping Name: None  
Hazard Class: None  
SubRisk: None  
UN/NA Number: None  
Packing Group: None  
Additional Shipping Information:  
International Transport Regulations:  
IMO: None

## Section 15 - REGULATORY INFORMATION

### RISK

#### US Federal Regulations

##### A. General Product Information

In addition to Federal and State regulation, local regulations may apply. Check with your local regulatory authorities.

##### B. Component Information

This material contains one or more of the following chemicals required

continued...

# LIQUID NITRATE TEST SOLUTION #2

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Section 15 - REGULATORY INFORMATION

to be identified under SARA Section 302 (40 CFR 455 Appendix A)  
SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4): None

Component TSCA  
polyethylene glycol Y  
sulfanilamide Y

## State Regulations

### A. General Product Information

### B. Component Information

The following components appear on one or more of the following state hazardous substance lists.

Component	CAS No	CA	FL	MA	MN	NJ	PA
polyethylene glycol	25322-68-3	N	N	N	Y	N	N
sulfanilamide	63-74-1	N	N	N	N	N	N

Y=Yes this material appears on that state's hazardous substances list.

N=No this material does not appear on that state's hazardous substances list.

## Other Regulations

### A. General Product Information

All components are listed in the European Inventory of New and Existing Chemical Substances (EINECS)

### B. Component Information

#### CANADA

The following component(s) are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

All of this product's components are on the Canadian Domestic

## REGULATIONS

polyethylene glycol (CAS: 25322-68-3) is found on the following regulatory lists

Canadian Domestic Substances List (DSL)

US Toxic Substances Control Act (TSCA)

US Minnesota Hazardous Substance List

US EPA High Production Volume Program Chemical List

US California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELs) - Respiratory

US Food Additive Database

sulfanilamide (CAS: 63-74-1) is found on the following regulatory lists

Canadian Domestic Substances List (DSL)

US Toxic Substances Control Act (TSCA)

US DOE Temporary Emergency Exposure Limits (TEELs)

US California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELs) - Respiratory

## Section 16 - OTHER INFORMATION

Reasonable care has been taken in the preparation of this information, but the author makes no warranty of merchantability or any other warranty, expressed or implied, with respect to this information. The author makes no representations

continued...

## LIQUID NITRATE TEST SOLUTION #2

Chemwatch Material Safety Data Sheet

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Section 16 - OTHER INFORMATION

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and assumes no liability for any direct, incidental or consequential damages resulting from its use. For additional technical information please call our toxicology department on +800 CHEMCALL.

Issue Date: Tue 4-Oct-2005

Print Date: Thu 6-Oct-2005

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# FRESHWATER PH INDICATOR SOLUTION

Chemwatch Material Safety Data Sheet  
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---

## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

---

### PRODUCT NAME

FRESHWATER PH INDICATOR SOLUTION

### STATEMENT OF HAZARDOUS NATURE

Not considered a hazardous substance according to OSHA 29  
CFR 1910.1200.

### SUPPLIER

Company: Aquarium Pharmaceuticals Incorporated  
Address:  
50 East Hamilton Street  
Chalfont  
PA, 18914  
USA  
Telephone: +1 215 822 8181

Company: Aquarium Pharmaceuticals Incorporated  
Address:  
PO Box 218  
Chalfont  
PA, 18914-0218  
USA  
Telephone: +1 215 822 8181  
Emergency Tel: +1800 222 1222 (US Only)

### PRODUCT USE

pH indicator solution for product 28.

### SYNONYMS

"Solution ID# 3320"

---

## Section 2 - COMPOSITION / INFORMATION ON INGREDIENTS

---

NAME	CAS RN	%
non hazardous ingredients		100

---

## Section 3 - HAZARDS IDENTIFICATION

---

### CANADIAN WHMIS SYMBOLS

None

### EMERGENCY OVERVIEW

#### RISK

### POTENTIAL HEALTH EFFECTS

#### ACUTE HEALTH EFFECTS

#### SWALLOWED

The material has NOT been classified as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence. The material may still be damaging to the health of the individual, following ingestion, especially where pre-existing organ (e.g. liver, kidney) damage is evident. Present definitions of harmful or toxic substances are generally based on doses producing mortality

continued...

# FRESHWATER PH INDICATOR SOLUTION

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Section 3 - HAZARDS IDENTIFICATION

(death) rather than those producing morbidity (disease, ill-health).  
Gastrointestinal tract discomfort may produce nausea and vomiting. In an occupational setting however, unintentional ingestion is not thought to be cause for concern.

## EYE

Although the liquid is not thought to be an irritant, direct contact with the eye may produce transient discomfort characterized by tearing or conjunctival redness (as with windburn).

## SKIN

The material is not thought to produce adverse health effects or skin irritation following contact (as classified using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.

## INHALED

The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.

## CHRONIC HEALTH EFFECTS

Long-term exposure to the product is not thought to produce chronic effects adverse to the health (as classified using animal models); nevertheless exposure by all routes should be minimized as a matter of course.

---

## Section 4 - FIRST AID MEASURES

---

### SWALLOWED

- Immediately give a glass of water.
- First aid is not generally required. If in doubt, contact a Poisons Information Center or a doctor.

### EYE

- If this product comes in contact with eyes:
- Wash out immediately with water.
  - If irritation continues, seek medical attention.
  - Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

### SKIN

- If skin or hair contact occurs:
- Flush skin and hair with running water (and soap if available).
  - Seek medical attention in event of irritation.

### INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Other measures are usually unnecessary.

### NOTES TO PHYSICIAN

Treat symptomatically.

continued...

# FRESHWATER PH INDICATOR SOLUTION

Chemwatch Material Safety Data Sheet  
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## Section 5 - FIRE FIGHTING MEASURES

---

Flash Point (°F): Not Applicable  
Lower Explosive Limit (%): Not Applicable  
Upper Explosive Limit (%): Not Applicable  
Autoignition Temp (°F): Not Applicable

### EXTINGUISHING MEDIA

- There is no restriction on the type of extinguisher which may be used.  
Use extinguishing media suitable for surrounding area.

### FIRE FIGHTING

- Use water delivered as a fine spray to control fire and cool adjacent area.  
- DO NOT approach containers suspected to be hot.  
- Cool fire exposed containers with water spray from a protected location.  
- If safe to do so, remove containers from path of fire.  
- Equipment should be thoroughly decontaminated after use.

### GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

- Non combustible.  
- Not considered to be a significant fire risk.  
- Expansion or decomposition on heating may lead to violent rupture of containers.  
- Decomposes on heating and may produce toxic/ irritating fumes.  
- May emit acrid smoke.

### FIRE INCOMPATIBILITY

Avoid contamination with oxidizing agents i.e. nitrates, oxidizing acids, chlorine bleaches, pool chlorine etc. as ignition may result.

---

## Section 6 - ACCIDENTAL RELEASE MEASURES

---

### MINOR SPILLS

- Clean up all spills immediately.  
- Avoid breathing vapors and contact with skin and eyes.  
- Control personal contact by using protective equipment.  
- Contain and absorb spill with sand, earth, inert material or vermiculite.  
- Wipe up.  
- Place in a suitable labeled container for waste disposal.

### MAJOR SPILLS

- Clear area of personnel and move upwind.  
- Alert Emergency Responders and tell them location and nature of hazard.  
- Control personal contact by using protective equipment.  
- Prevent spillage from entering drains, sewers or water courses.  
- Recover product wherever possible.  
- Put residues in labeled containers for disposal.  
- If contamination of drains or waterways occurs, advise emergency services.

## ACUTE EXPOSURE GUIDELINE LEVELS (AEGLE) (in ppm)

AEGLE 1: The airborne concentration of a substance above which it is predicted

continued...

# FRESHWATER PH INDICATOR SOLUTION

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## Section 6 - ACCIDENTAL RELEASE MEASURES

---

that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure.

AEGL 2: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.

AEGL 3: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience life-threatening health effects or death.

---

## Section 7 - HANDLING AND STORAGE

---

### PROCEDURE FOR HANDLING

- Limit all unnecessary personal contact.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- When handling DO NOT eat, drink or smoke.
- Always wash hands with soap and water after handling.
- Avoid physical damage to containers.
- Use good occupational work practice.
- Observe manufacturer's storing and handling recommendations.

### RECOMMENDED STORAGE METHODS

- Polyethylene or polypropylene container.
- Packing as recommended by manufacturer
- Check all containers are clearly labeled and free from leaks.

### STORAGE REQUIREMENTS

- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storing and handling recommendations.

---

## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

---

### EXPOSURE CONTROLS

Not available. Refer to individual constituents.

### PERSONAL PROTECTION

Glasses:

Chemical goggles.

Gloves:

When handling larger quantities:

General purpose rubber glove.

Respirator:

continued...

# FRESHWATER PH INDICATOR SOLUTION

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

---

### EYE

- Safety glasses with side shields
- Chemical goggles.
- Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them.

### HANDS/FEET

Wear general protective gloves, e.g.. light weight rubber gloves.

### OTHER

No special equipment needed when handling small quantities.

#### OTHERWISE:

- Overalls.
- Barrier cream.
- Eyewash unit.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.

Use appropriate NIOSH-certified respirator based on informed professional judgement. In conditions where no reasonable estimate of exposure can be made, assume the exposure is in a concentration IDLH and use NIOSH-certified full face pressure demand SCBA with a minimum service life of 30 minutes, or a combination full facepiece pressure demand SAR with auxiliary self-contained air supply. Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.

## ENGINEERING CONTROLS

General exhaust is adequate under normal operating conditions. If risk of overexposure exists, wear an approved respirator. Correct fit is essential to obtain adequate protection. Provide adequate ventilation in warehouse or closed storage areas.

---

## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

---

### PHYSICAL PROPERTIES

Liquid.  
Mixes with water.

Molecular Weight: Not Applicable  
Melting Range (°C): Not Available  
Solubility in water (g/L): Miscible  
pH (1% solution): Not Available  
Volatile Component (%vol): Not Available  
Relative Vapor Density (air=1): Not Available  
Lower Explosive Limit (%): Not Applicable  
Autoignition Temp (°C): Not Applicable  
State: Liquid

Boiling Range (°C): Not Available  
Specific Gravity (water=1): 0.997  
pH (as supplied): 4.5-5.8  
Vapor Pressure (kPa): Not Available  
Evaporation Rate: Not Available  
Flash Point (°C): Not Applicable  
Upper Explosive Limit (%): Not Applicable  
Decomposition Temp (°C): Not Available

### APPEARANCE

Orange brown odorless liquid; mixes with water.

continued...

# FRESHWATER PH INDICATOR SOLUTION

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---

## Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

---

### CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerization will not occur.

### STORAGE INCOMPATIBILITY

- Avoid contamination of water, foodstuffs, feed or seed.
- Avoid reaction with oxidizing agents.

---

## Section 11 - TOXICOLOGICAL INFORMATION

---

### Freshwater pH Indicator Solution

Not available. Refer to individual constituents.  
unless otherwise specified data extracted from RTECS - Register of Toxic Effects  
of Chemical Substances

---

## Section 12 - ECOLOGICAL INFORMATION

---

---

## Section 13 - DISPOSAL CONSIDERATIONS

---

### Disposal Instructions

- All waste must be handled in accordance with local, state and federal regulations.
- Recycle wherever possible.
- Consult manufacturer for recycling options or consult Waste Management Authority for disposal if no suitable treatment or disposal facility can be identified.
- Dispose of by: Burial in a licensed land-fill or Incineration in a licensed apparatus (after admixture with suitable combustible material)
- Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.

---

## Section 14 - TRANSPORTATION INFORMATION

---

DOT Information  
Shipping Name: None  
Hazard Class: None  
SubRisk: None  
UN/NA Number: None  
Packing Group: None  
Additional Shipping Information:  
International Transport Regulations:  
IMO: None

continued...

# FRESHWATER PH INDICATOR SOLUTION

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---

## Section 15 - REGULATORY INFORMATION

---

### RISK

#### US Federal Regulations

##### A. General Product Information

In addition to Federal and State regulation, local regulations may apply. Check with your local regulatory authorities.

##### B. Component Information

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 455 Appendix A)

SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4): None

-----  
Component TSCA

#### State Regulations

##### A. General Product Information

##### B. Component Information

The following components appear on one or more of the following state hazardous substance lists.

Component CAS No CA FL MA MN NJ PA

Y=Yes this material appears on that state's hazardous substances list.

N=No this material does not appear on that state's hazardous substances list.

#### Other Regulations

##### A. General Product Information

All components are listed in the European Inventory of New and Existing Chemical Substances (EINECS)

##### B. Component Information

CANADA

All of this product's components are on the Canadian Domestic

---

## Section 16 - OTHER INFORMATION

---

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# HIGH RANGE PH TEST SOLUTION

Chemwatch Material Safety Data Sheet  
Issue Date: Mon 3-Oct-2005

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---

## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

---

### PRODUCT NAME

HIGH RANGE PH TEST SOLUTION

### STATEMENT OF HAZARDOUS NATURE

Not considered a hazardous substance according to OSHA 29  
CFR 1910.1200.

### SUPPLIER

Company: Aquarium Pharmaceuticals Incorporated  
Address:  
50 East Hamilton Street  
Chalfont  
PA, 18914  
USA  
Telephone: +1 215 822 8181

Company: Aquarium Pharmaceuticals Incorporated  
Address:  
PO Box 218  
Chalfont  
PA, 18914-0218  
USA  
Telephone: +1 215 822 8181  
Emergency Tel: +1800 222 1222 (US Only)

### PRODUCT USE

pH test solution for product 27, 34 and 401M.

### SYNONYMS

"Solution ID# 3339"

---

## Section 2 - COMPOSITION / INFORMATION ON INGREDIENTS

---

NAME	CAS RN	%
m-cresol purple	2303-01-7	N/S^

---

## Section 3 - HAZARDS IDENTIFICATION

---

### CANADIAN WHMIS SYMBOLS

None

### EMERGENCY OVERVIEW

#### RISK

### POTENTIAL HEALTH EFFECTS

#### ACUTE HEALTH EFFECTS

#### SWALLOWED

The material has NOT been classified as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence. The material may still be damaging to the health of the individual, following ingestion, especially where pre-existing organ (e.g. liver, kidney) damage is evident. Present definitions of harmful or toxic substances are generally based on doses producing mortality

continued...

# HIGH RANGE PH TEST SOLUTION

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Section 3 - HAZARDS IDENTIFICATION

(death) rather than those producing morbidity (disease, ill-health).  
Gastrointestinal tract discomfort may produce nausea and vomiting. In an occupational setting however, unintentional ingestion is not thought to be cause for concern.

## EYE

Although the liquid is not thought to be an irritant, direct contact with the eye may produce transient discomfort characterized by tearing or conjunctival redness (as with windburn).

## SKIN

The material is not thought to produce adverse health effects or skin irritation following contact (as classified using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.

## INHALED

The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.

## CHRONIC HEALTH EFFECTS

Long-term exposure to the product is not thought to produce chronic effects adverse to the health (as classified using animal models); nevertheless exposure by all routes should be minimized as a matter of course.

---

## Section 4 - FIRST AID MEASURES

---

### SWALLOWED

- Immediately give a glass of water.
- First aid is not generally required. If in doubt, contact a Poisons Information Center or a doctor.

### EYE

- If this product comes in contact with eyes:
- Wash out immediately with water.
  - If irritation continues, seek medical attention.
  - Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

### SKIN

- If skin or hair contact occurs:
- Flush skin and hair with running water (and soap if available).
  - Seek medical attention in event of irritation.

### INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Other measures are usually unnecessary.

### NOTES TO PHYSICIAN

Treat symptomatically.

continued...

# HIGH RANGE PH TEST SOLUTION

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---

## Section 5 - FIRE FIGHTING MEASURES

---

Flash Point (°F): Not Applicable  
Lower Explosive Limit (%): Not Applicable  
Upper Explosive Limit (%): Not Applicable  
Autoignition Temp (°F): Not Applicable

### EXTINGUISHING MEDIA

- There is no restriction on the type of extinguisher which may be used.  
Use extinguishing media suitable for surrounding area.

### FIRE FIGHTING

- Use water delivered as a fine spray to control fire and cool adjacent area.
- DO NOT approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.
- Equipment should be thoroughly decontaminated after use.

### GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

- Non combustible.
- Not considered to be a significant fire risk.
- Expansion or decomposition on heating may lead to violent rupture of containers.
- Decomposes on heating and may produce toxic/ irritating fumes.
- May emit acrid smoke.

### FIRE INCOMPATIBILITY

None known.

---

## Section 6 - ACCIDENTAL RELEASE MEASURES

---

### MINOR SPILLS

- Clean up all spills immediately.
- Avoid breathing vapors and contact with skin and eyes.
- Control personal contact by using protective equipment.
- Contain and absorb spill with sand, earth, inert material or vermiculite.
- Wipe up.
- Place in a suitable labeled container for waste disposal.

### MAJOR SPILLS

- Clear area of personnel and move upwind.
- Alert Emergency Responders and tell them location and nature of hazard.
- Control personal contact by using protective equipment.
- Prevent spillage from entering drains, sewers or water courses.
- Recover product wherever possible.
- Put residues in labeled containers for disposal.
- If contamination of drains or waterways occurs, advise emergency services.

## ACUTE EXPOSURE GUIDELINE LEVELS (AEG) (in ppm)

AEG 1: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could

continued...

# HIGH RANGE PH TEST SOLUTION

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## Section 6 - ACCIDENTAL RELEASE MEASURES

---

experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure.

AEGL 2: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.

AEGL 3: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience life-threatening health effects or death.

---

## Section 7 - HANDLING AND STORAGE

---

### PROCEDURE FOR HANDLING

- Limit all unnecessary personal contact.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- When handling DO NOT eat, drink or smoke.
- Always wash hands with soap and water after handling.
- Avoid physical damage to containers.
- Use good occupational work practice.
- Observe manufacturer's storing and handling recommendations.

### RECOMMENDED STORAGE METHODS

- Polyethylene or polypropylene container.
- Packing as recommended by manufacturer
- Check all containers are clearly labeled and free from leaks.

### STORAGE REQUIREMENTS

- Store in original containers.
  - Keep containers securely sealed.
  - Store in a cool, dry, well-ventilated area.
  - Store away from incompatible materials and foodstuff containers.
  - Protect containers against physical damage and check regularly for leaks.
  - Observe manufacturer's storing and handling recommendations.
- 

## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

---

### EXPOSURE CONTROLS

Not available. Refer to individual constituents.

### PERSONAL PROTECTION

Glasses:

Chemical goggles.

Gloves:

When handling larger quantities:

General purpose rubber glove.

Respirator:

continued...

# HIGH RANGE PH TEST SOLUTION

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CD 2005/3 Page 5 of 8

## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

---

### EYE

- Safety glasses with side shields
- Chemical goggles.
- Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them.

### HANDS/FEET

Wear general protective gloves, e.g.. light weight rubber gloves.

### OTHER

No special equipment needed when handling small quantities.

OTHERWISE:

- Overalls.
- Barrier cream.
- Eyewash unit.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.

Use appropriate NIOSH-certified respirator based on informed professional judgement. In conditions where no reasonable estimate of exposure can be made, assume the exposure is in a concentration IDLH and use NIOSH-certified full face pressure demand SCBA with a minimum service life of 30 minutes, or a combination full facepiece pressure demand SAR with auxiliary self-contained air supply. Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.

## ENGINEERING CONTROLS

General exhaust is adequate under normal operating conditions. If risk of overexposure exists, wear an approved respirator. Correct fit is essential to obtain adequate protection. Provide adequate ventilation in warehouse or closed storage areas.

---

## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

---

### PHYSICAL PROPERTIES

Liquid.  
Mixes with water.

Molecular Weight: Not Applicable  
Melting Range (°C): Not Available  
Solubility in water (g/L): Miscible  
pH (1% solution): Not Available  
Volatile Component (%vol): Not Available  
Relative Vapor Density (air=1): Not Available  
Lower Explosive Limit (%): Not Applicable  
Autoignition Temp (°C): Not Applicable  
State: Liquid

Boiling Range (°C): Not Available  
Specific Gravity (water=1): 0.997 approx.  
pH (as supplied): 7.6-8.4  
Vapor Pressure (kPa): Not Available  
Evaporation Rate: Not Available  
Flash Point (°C): Not Applicable  
Upper Explosive Limit (%): Not Applicable  
Decomposition Temp (°C): Not Available

### APPEARANCE

Purple red solution with a mild odor; mixes with water.

continued...

# HIGH RANGE PH TEST SOLUTION

Chemwatch Material Safety Data Sheet  
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---

## Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

---

### CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerization will not occur.

### STORAGE INCOMPATIBILITY

Avoid contamination of water, foodstuffs, feed or seed. None known.

---

## Section 11 - TOXICOLOGICAL INFORMATION

---

### High Range pH Test Solution

Not available. Refer to individual constituents.

unless otherwise specified data extracted from RTECS - Register of Toxic Effects  
of Chemical Substances

---

## Section 12 - ECOLOGICAL INFORMATION

---

---

## Section 13 - DISPOSAL CONSIDERATIONS

---

### Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.

- Recycle wherever possible.
- Consult manufacturer for recycling options or consult Waste Management Authority for disposal if no suitable treatment or disposal facility can be identified.
- Dispose of by: Burial in a licensed land-fill or Incineration in a licensed apparatus (after admixture with suitable combustible material)
- Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.

---

## Section 14 - TRANSPORTATION INFORMATION

---

DOT Information

Shipping Name: None

Hazard Class: None

SubRisk: None

UN/NA Number: None

Packing Group: None

Additional Shipping Information:

International Transport Regulations:

IMO: None

continued...

# HIGH RANGE PH TEST SOLUTION

Chemwatch Material Safety Data Sheet  
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---

## Section 15 - REGULATORY INFORMATION

---

### RISK

#### US Federal Regulations

##### A. General Product Information

In addition to Federal and State regulation, local regulations may apply. Check with your local regulatory authorities.

##### B. Component Information

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 455 Appendix A)

SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4): None

-----  
Component            TSCA  
m-cresol purple      Y

#### State Regulations

##### A. General Product Information

##### B. Component Information

The following components appear on one or more of the following state hazardous substance lists.

Component	CAS No	CA	FL	MA	MN	NJ	PA
m-cresol purple	2303-01-7	N	N	N	N	N	N

Y=Yes this material appears on that state's hazardous substances list.

N=No this material does not appear on that state's hazardous substances list.

#### Other Regulations

##### A. General Product Information

All components are listed in the European Inventory of New and Existing Chemical Substances (EINECS)

##### B. Component Information

CANADA

All of this product's components are on the Canadian Domestic

---

## Section 16 - OTHER INFORMATION

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Issue Date: Mon 3-Oct-2005

Print Date: Thu 6-Oct-2005

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continued...

# HIGH RANGE PH TEST SOLUTION

Chemwatch Material Safety Data Sheet

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Section 16 - OTHER INFORMATION

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# FRESHWATER/SALTWATER NITRITE TEST SOLUTION

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## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

---

### PRODUCT NAME

FRESHWATER/SALTWATER NITRITE TEST SOLUTION

### STATEMENT OF HAZARDOUS NATURE

**CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.**

### SUPPLIER

Company: Aquarium Pharmaceuticals Inc  
Address:  
PO Box 218  
Chalfont  
PA, 18914- 0218  
USA  
Telephone: +1 215 822 8181  
Emergency Tel: +1800 222 1222 (US Only)

Company: Aquarium Pharmaceuticals Inc  
Address:  
50 East Hamilton Street  
Chalfont  
PA, 18914  
USA  
Telephone: +1 215 822 8181  
Fax: +1 215 822 1906

### PRODUCT USE

Nitrate test solution for products 26, 34 and 401M.

### SYNONYMS

"Solution ID# 3317"

---

## Section 2 - HAZARDS IDENTIFICATION

---

### CANADIAN WHMIS SYMBOLS

None

### EMERGENCY OVERVIEW

#### RISK

### POTENTIAL HEALTH EFFECTS

#### ACUTE HEALTH EFFECTS

#### SWALLOWED

The material has NOT been classified by EC Directives or other classification systems as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence. The material may still be damaging to the health of the individual, following ingestion, especially where pre-existing organ (e.g liver, kidney) damage is evident. Present definitions of harmful or toxic substances are generally based on doses producing mortality rather than those producing morbidity (disease, ill-health). Gastrointestinal tract discomfort may produce nausea and vomiting. In an occupational setting however, ingestion of insignificant quantities is not thought to be cause for concern.

#### EYE

Although the liquid is not thought to be an irritant (as classified by EC Directives), direct contact with the eye may produce transient discomfort characterised by tearing or conjunctival redness (as with windburn).

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Section 2 - HAZARDS IDENTIFICATION

## SKIN

The material is not thought to produce adverse health effects or skin irritation following contact (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.

## INHALED

The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.

Not normally a hazard due to non-volatile nature of product.

Inhalation hazard is increased at higher temperatures.

## CHRONIC HEALTH EFFECTS

Long-term exposure to the product is not thought to produce chronic effects adverse to health (as classified by EC Directives using animal models); nevertheless exposure by all routes should be minimised as a matter of course.

---

## Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
polyethylene glycol	25322-68-3	<95
hydrochloric acid	7647-01-0	0.97

---

## Section 4 - FIRST AID MEASURES

### SWALLOWED

- Immediately give a glass of water.
- First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor.

### EYE

If this product comes in contact with eyes:

- Wash out immediately with water.
- If irritation continues, seek medical attention.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

### SKIN

If skin or hair contact occurs:

- Flush skin and hair with running water (and soap if available).
- Seek medical attention in event of irritation.

### INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Other measures are usually unnecessary.

### NOTES TO PHYSICIAN

Treat symptomatically.

continued...

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## Section 5 - FIRE FIGHTING MEASURES

---

Flash Point (°F): Not Applicable  
Lower Explosive Limit (%): Not Applicable  
Upper Explosive Limit (%): Not Applicable  
Autoignition Temp (°F): Not Applicable

### EXTINGUISHING MEDIA

- Water spray or fog.
- Foam.
- Dry chemical powder.
- BCF (where regulations permit).
- Carbon dioxide.

### FIRE FIGHTING

- Alert Fire Brigade and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Use water delivered as a fine spray to control fire and cool adjacent area.
- Avoid spraying water onto liquid pools.
- DO NOT approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.

### GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

- Combustible.
- Slight fire hazard when exposed to heat or flame.
- Heating may cause expansion or decomposition leading to violent rupture of containers.
- On combustion, may emit toxic fumes of carbon monoxide (CO).
- May emit acrid smoke.
- Mists containing combustible materials may be explosive.

Combustion products include: carbon dioxide (CO<sub>2</sub>), hydrogen chloride, other pyrolysis products typical of burning organic material, phosgene.

### FIRE INCOMPATIBILITY

Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result.

### PERSONAL PROTECTION

Glasses:  
Safety Glasses.  
Chemical goggles.  
Gloves:  
When handling larger quantities:  
General purpose rubber glove.  
Respirator:  
Type B- P Filter of sufficient capacity

---

## Section 6 - ACCIDENTAL RELEASE MEASURES

---

### MINOR SPILLS

- Remove all ignition sources.
- Clean up all spills immediately.
- Avoid breathing vapours and contact with skin and eyes.
- Control personal contact by using protective equipment.
- Contain and absorb spill with sand, earth, inert material or vermiculite.
- Wipe up.

continued...

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## Section 6 - ACCIDENTAL RELEASE MEASURES

---

- Place in a suitable labelled container for waste disposal.

### MAJOR SPILLS

Moderate hazard.

- Clear area of personnel and move upwind.
- Alert Fire Brigade and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or water course.
- No smoking, naked lights or ignition sources.
- Increase ventilation.
- Stop leak if safe to do so.
- Contain spill with sand, earth or vermiculite.
- Collect recoverable product into labelled containers for recycling.
- Absorb remaining product with sand, earth or vermiculite.
- Collect solid residues and seal in labelled drums for disposal.
- Wash area and prevent runoff into drains.
- If contamination of drains or waterways occurs, advise emergency services.

---

## Section 7 - HANDLING AND STORAGE

---

### PROCEDURE FOR HANDLING

DO NOT USE brass or copper containers / stirrers.

- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- Prevent concentration in hollows and sumps.
- DO NOT enter confined spaces until atmosphere has been checked.
- Avoid smoking, naked lights or ignition sources.
- Avoid contact with incompatible materials.
- When handling, DO NOT eat, drink or smoke.
- Keep containers securely sealed when not in use.
- Avoid physical damage to containers.
- Always wash hands with soap and water after handling.
- Work clothes should be laundered separately.
- Use good occupational work practice.
- Observe manufacturer's storing and handling recommendations.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions.

### RECOMMENDED STORAGE METHODS

- Metal can or drum
- Packaging as recommended by manufacturer.
- Check all containers are clearly labelled and free from leaks.

### STORAGE REQUIREMENTS

- Store in original containers.
- Keep containers securely sealed.
- No smoking, naked lights or ignition sources.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storing and handling recommendations.

continued...

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

### EXPOSURE CONTROLS

Z	US OSHA Permissible Exposure Levels ( PELs)											
	Material	TWA ppm	TWA mg/m <sup>3</sup>	STEL ppm	STEL mg/m <sup>3</sup>	Peak ppm	Peak mg/m <sup>3</sup>	Max excursion ppm	Max excursion mg/m <sup>3</sup>	Max excursion duration (mins)	TWA F/CC	
Z1	Hydrogen chloride					5	7					
Source	Material	TWA ppm	TWA mg/m <sup>3</sup>	STEL ppm	STEL mg/m <sup>3</sup>	Peak ppm	Peak mg/m <sup>3</sup>	Peak ppm	Peak mg/m <sup>3</sup>	TWA F/CC		
Canada - Saskatchewan Occupational Health and Safety Regulation	polyethylene glycol (Respirable size+)		3		6							
Canada - Saskatchewan Occupational Health and Safety Regulation	polyethylene glycol (Particulates, NOC++)		10		20							
Canada - British Columbia Occupational Exposure Limits	polyethylene glycol (Particles Insoluble or Poorly Soluble) Not Otherwise Classified (PNOC))		10									
US - Minnesota Permissible Exposure Limits (PELs)	hydrochloric acid (Hydrogen chloride)							5	7			
Canada - Ontario Occupational	hydrochloric acid (Hydrogen							2				

continued...

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Source	Material	TWA ppm	TWA mg/m <sup>3</sup>	STEL ppm	STEL mg/m <sup>3</sup>	Peak ppm	Peak mg/m <sup>3</sup>	TWA F/CC
al	chloride)							
Exposure								
Limits								
Canada -	hydrochlor					5	7, 5	
Quebec	ic acid							
Occupation	(Chlorure							
al	d'							
Exposure	hydrogène)							
Limits								
(French)								
US -	hydrochlor	(C)5	(C)7					
Vermont	ic acid							
Permissibl	(Hydrogen							
e Exposure	chloride)							
Limits								
Table Z-								
1- A								
Transition								
al Limits								
for Air								
Contaminan								
ts								
US -	hydrochlor					5	7	
Vermont	ic acid							
Permissibl	(Hydrogen							
e Exposure	chloride)							
Limits								
Table Z-								
1- A Final								
Rule								
Limits for								
Air								
Contaminan								
ts								
US -	hydrochlor					5	7	
Tennessee	ic acid							
Occupation	(Hydrogen							
al	chloride)							
Exposure								
Limits -								
Limits For								
Air								
Contaminan								
ts								
US -	hydrochlor					5	7	
California	ic acid							
Permissibl	(Hydrogen							
e Exposure	chloride;							
Limits for	muriatic							
Chemical	acid)							
Contaminan								
ts								
US - Idaho	hydrochlor					5	7	
- Limits	ic acid							
for Air	(Hydrogen							

continued...

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Source	Material	TWA ppm	TWA mg/m <sup>3</sup>	STEL ppm	STEL mg/m <sup>3</sup>	Peak ppm	Peak mg/m <sup>3</sup>	TWA F/CC
Contaminants								
US - Hawaii Air Contaminant Limits	hydrochloric acid (Hydrogen chloride)					5	7	
US OSHA Permissible Exposure Levels (PELs) - Table Z1	hydrochloric acid (Hydrogen chloride)					5	7	
Canada - Saskatchewan Occupational Health and Safety Regulations - Contaminant Limits	hydrochloric acid (Hydrogen chloride)						7.5	
Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances	hydrochloric acid (Hydrogen chloride)	5	7	-	-			
US - Washington Permissible exposure limits of air contaminants	hydrochloric acid (Hydrogen chloride)					5.0		
Canada - Alberta Occupational Exposure Limits	hydrochloric acid (Hydrogen chloride)					5	7.5	
Canada - British Columbia Occupational Exposure Limits (Revised 2003))	hydrochloric acid (Hydrogen chloride)					2		
US NIOSH Recommended	hydrochloric acid					5	7	

continued...

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Source	Material	TWA ppm	TWA mg/m <sup>3</sup>	STEL ppm	STEL mg/m <sup>3</sup>	Peak ppm	Peak mg/m <sup>3</sup>	TWA F/CC
d Exposure Limits (RELs)	(Hydrogen chloride)							
US ACGIH Threshold Limit Values (TLV)	hydrochloric acid (Hydrogen chloride)					2		

### EMERGENCY EXPOSURE LIMITS

Material	Revised IDLH Value (mg/m <sup>3</sup> )	Revised IDLH Value (ppm)
hydrochloric acid		50

### ODOR SAFETY FACTOR (OSF)

OSF=1.3 (hydrochloric acid)  
 Exposed individuals are NOT reasonably expected to be warned, by smell, that the Exposure Standard is being exceeded.  
 Odour Safety Factor (OSF) is determined to fall into either Class C, D or E.  
 The Odour Safety Factor (OSF) is defined as:  
 $OSF = \frac{\text{Exposure Standard (TWA) ppm}}{\text{Odour Threshold Value (OTV) ppm}}$   
 Classification into classes follows:

Class	OSF	Description
A	550	Over 90% of exposed individuals are aware by smell that the Exposure Standard (TLV- TWA for example) is being reached, even when distracted by working activities
B	26- 550	As " A" for 50- 90% of persons being distracted
C	1- 26	As " A" for less than 50% of persons being distracted
D	0.18- 1	10- 50% of persons aware of being tested perceive by smell that the Exposure Standard is being reached
E	<0.18	As " D" for less than 10% of persons aware of being tested

### MATERIAL DATA

#### INGREDIENT DATA

POLYETHYLENE GLYCOL:

For powdered forms:

The polyethylene glycols are extremely low in oral toxicity, are not significantly irritating to the eyes or skin, and are not absorbed through the skin in toxic amounts. vapour pressures are extremely low and inhalation exposure is limited to mists. Based on experimental data and human experience, these substances do not present significant hazards to health in the workplace.

continued...

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

### HYDROCHLORIC ACID:

Odour Threshold Value: 0.262 ppm (detection), 10.06 ppm (recognition)

NOTE: Detector tubes for hydrochloric acid, measuring in excess of 1 ppm, are available commercially.

Hydrogen chloride is a strong irritant to the eyes, mucous membranes and skin. Chronic exposure produces a corrosive action on the teeth. Reports of respiratory irritation following short-term exposure at 5 ppm have led to the recommended TLV-C. There is no indication that skin contact with hydrogen chloride elicits systemic poisoning and a skin designation has not been applied.

Exposure of humans to hydrogen chloride at 50 to 100 ppm for 1 hour is reported to be barely tolerable; 35 ppm caused irritation of the throat on short exposure and 10 ppm was the maximal concentration for prolonged exposure. It has been stated that hydrogen chloride at concentrations of 5 ppm is immediately irritating.

-

Toxic effects of hydrochloric acid

Concentration

Clinical effects

0.067 - 0.267 ppm

Reported range of odour thresholds and

changes in respiratory pattern

5 ppm

No organic damage

10 ppm

Irritation; work undisturbed

10-50 ppm

Work difficult but possible

35 ppm

Short exposure irritation of the throat

50-100 ppm

Exposure for 1 h barely tolerable

1000-2000 ppm

Brief exposure dangerous; laryngospasm

1300-2000 ppm

Lethal after a few minutes

## PERSONAL PROTECTION

### EYE

- Safety glasses with side shields
- Chemical goggles.
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59].

### HANDS/FEET

Wear general protective gloves, eg. light weight rubber gloves.

Suitability and durability of glove type is dependent on usage. Factors such as:

- frequency and duration of contact,
- chemical resistance of glove material,
- glove thickness and
- dexterity,

are important in the selection of gloves.

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

### OTHER

No special equipment needed when handling small quantities.

#### OTHERWISE:

- Overalls.
- Barrier cream.
- Eyewash unit.

### RESPIRATOR

Selection of the Class and Type of respirator will depend upon the level of breathing zone contaminant and the chemical nature of the contaminant. Protection Factors (defined as the ratio of contaminant outside and inside the mask) may also be important.

Breathing Zone Level ppm (volume)	Maximum Protection Factor	Half- face Respirator	Full- Face Respirator
1000	10	B- AUS P	-
1000	50	-	B- AUS P
5000	50	Airline *	-
5000	100	-	B- 2 P
10000	100	-	B- 3 P
	100+		Airline**

\* - Continuous Flow

\*\* - Continuous-flow or positive pressure demand.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.

Use appropriate NIOSH-certified respirator based on informed professional judgement. In conditions where no reasonable estimate of exposure can be made, assume the exposure is in a concentration IDLH and use NIOSH-certified full face pressure demand SCBA with a minimum service life of 30 minutes, or a combination full facepiece pressure demand SAR with auxiliary self-contained air supply. Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.

## ENGINEERING CONTROLS

General exhaust is adequate under normal operating conditions. If risk of overexposure exists, wear SAA approved respirator. Correct fit is essential to obtain adequate protection. Provide adequate ventilation in warehouse or closed storage areas.

## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

### PHYSICAL PROPERTIES

Liquid.

Mixes with water.

Molecular Weight: Not Applicable

Melting Range (°F): Not Available

Solubility in water (g/L): Miscible

pH (1% solution): Not Available

Volatile Component (%vol): Not Available

Relative Vapor Density (air=1): Not Available

Lower Explosive Limit (%): Not Applicable

Autoignition Temp (°F): Not Applicable

State: Liquid

Boiling Range (°F): Not Available

Specific Gravity (water= 1): 1.128

pH (as supplied): Not Available

Vapor Pressure (mmHg): Not Available

Evaporation Rate: Not Available

Flash Point (°F): Not Applicable

Upper Explosive Limit (%): Not Applicable

Decomposition Temp (°F): Not Available

Viscosity: Not Available

### APPEARANCE

Blue-green solution with no odour; mixes with water.

continued...

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## Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

### CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerisation will not occur.

### STORAGE INCOMPATIBILITY

Avoid contamination of water, foodstuffs, feed or seed.  
Avoid reaction with oxidising agents.

## Section 11 - TOXICOLOGICAL INFORMATION

### Freshwater/Saltwater Nitrite Test Solution

#### TOXICITY AND IRRITATION

The material may be irritating to the eye, with prolonged contact causing inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis. The material may cause skin irritation after prolonged or repeated exposure and may produce a contact dermatitis (nonallergic). This form of dermatitis is often characterised by skin redness (erythema) and swelling epidermis. Histologically there may be intercellular oedema of the spongy layer (spongiosis) and intracellular oedema of the epidermis.

#### POLYETHYLENE GLYCOL:

##### TOXICITY

Oral (rat) LD50: 33750 mg/kg

for molecular weights (200-8000) \*  
Oral (rat) LD50: 31000->50000 mg/kg  
Oral (mice) LD50: 38000->50000 mg/kg  
Oral (g.pig) LD50: 17000->50000 mg/kg  
Oral (rabbit) LD50: 14000->50000 mg/kg  
Intraperitoneal (mice) LD50: 3100-12900 mg/kg

##### IRRITATION

Skin (rabbit): 500mg/24h - mild.  
Eye (rabbit): 500mg/24h - mild.

\* AIHA WEEL Guides

#### HYDROCHLORIC ACID:

##### TOXICITY

Unreported (man) LDLo: 81 mg/kg  
Inhalation (human) LCLo: 1300 ppm/30 min  
Inhalation (human) LCLo: 3000 ppm/5 min  
Inhalation (rat) LC50: 3124 ppm/1h  
Oral (rat) LD50: 900 mg/kg

##### IRRITATION

Eye (rabbit): 5mg/30s - Mild

The substance is classified by IARC as Group 3:  
NOT classifiable as to its carcinogenicity to humans.  
Evidence of carcinogenicity may be inadequate or limited in animal testing.

MATERIAL	CARCINOGEN	SENSITIZER	SKIN	MUTAGEN	REPROTOXIN
hydrochloric acid	ACGIH:A4				

#### CARCINOGEN

ACGIH: hydrochloric acid: A4

continued...

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## Section 12 - ECOLOGICAL INFORMATION

---

No data for Freshwater/Saltwater Nitrite Test Solution.  
Refer to data for ingredients, which follows:

POLYETHYLENE GLYCOL:  
BOD 5 if unstated: 0-0.02,1%  
COD: 1.62-1.74,98%  
Toxicity Fish: TLm(96)>10000mg/L

HYDROCHLORIC ACID:  
Hazardous Air Pollutant: Yes  
Fish LC50 (96hr.) (mg/l): 0.282

Prevent, by any means available, spillage from entering drains or water courses.

DO NOT discharge into sewer or waterways.

Ecotoxicity

Fish LC100 (24 h): trout 10 mg/l

TLm (96 h): mosquito fish 282 ppm (fresh water)

LC50: goldfish 178 mg/l

Shrimp LC50 (48 h): 100 - 330 ppm (salt water)

Starfish LC50 (48 h): 100 - 330 mg/l

Cockle LC50 (48 h): 330 - 1000 mg/l

[Hach]

Hydrogen chloride in water dissociates almost completely, releasing hydrogen and chloride ions; the hydrogen ions are captured by water to produce hydronium ions.

Hydrochloric acid infiltrates soil, the rate dependent on moisture content. During soil transport, hydrochloric acid dissolves soil components.

Drinking water standard:

chloride: 400 mg/l (UK max.)

250 mg/l (WHO guideline)

---

## Section 13 - DISPOSAL CONSIDERATIONS

---

### Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.

DO NOT allow wash water from cleaning or process equipment to enter drains.

It may be necessary to collect all wash water for treatment before disposal.

In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first. Where in doubt contact the responsible authority.

- Recycle wherever possible or consult manufacturer for recycling options.
- Consult State Land Waste Authority for disposal.
- Bury or incinerate residue at an approved site.
- Recycle containers if possible, or dispose of in an authorised landfill.

Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.

A Hierarchy of Controls seems to be common - the user should investigate:

- Reduction,
- Reuse
- Recycling
- Disposal (if all else fails)

continued...

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Section 13 - DISPOSAL CONSIDERATIONS

This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. If it has been contaminated, it may be possible to reclaim the product by filtration, distillation or some other means. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.

## Section 14 - TRANSPORTATION INFORMATION

NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS:UN, IATA,  
IMDG

## Section 15 - REGULATORY INFORMATION

### REGULATIONS

#### US EPCRA Section 313 Chemical List For Reporting Year 2004

Ingredient	CAS	% de minimus concentration
hydrochloric acid	7647- 01- 0	1.0

#### US CERCLA List of Hazardous Substances and Reportable Quantities

Ingredient	CAS	RQ (Pounds)	RQ (KG)
hydrochloric acid	7647- 01- 0	5000	2270

polyethylene glycol (CAS: 25322-68-3) is found on the following regulatory lists;

- Canada - British Columbia Occupational Exposure Limits
- Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits
- Canada Domestic Substances List (DSL)
- IMO MARPOL 73/78 (Annex II) - List of Other Liquid Substances
- US - Minnesota Hazardous Substance List
- US Cosmetic Ingredient Review (CIR) Cosmetic ingredients found safe, with qualifications
- US DOE Temporary Emergency Exposure Limits (TEELs)
- US DOT Coast Guard Bulk Hazardous Materials - List of Flammable and Combustible Bulk Liquid Cargoes
- US EPA High Production Volume Program Chemical List
- US Food Additive Database
- US Premarket Notifications for Food Contact Substances
- US Toxic Substances Control Act (TSCA) - Inventory

hydrochloric acid (CAS: 7647-01-0) is found on the following regulatory lists;

- Canada - Alberta Ambient Air Quality Objectives
- Canada - Alberta Occupational Exposure Limits
- Canada - British Columbia Occupational Exposure Limits
- Canada - Ontario Occupational Exposure Limits
- Canada - Quebec Occupational Exposure Limits (French)
- Canada - Saskatchewan Industrial Hazardous Substances
- Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits
- Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances
- Canada Controlled Drugs and Substances Act Schedule VI
- Canada Domestic Substances List (DSL)
- Canada Environmental Quality Guidelines (EQGs) Water: Community
- Canada Ingredient Disclosure List (SOR/88-64)
- Canada National Pollutant Release Inventory (NPRI)
- Canada Prohibited Toxic Substances - Schedule 2: Concentration Limits (French)

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Section 15 - REGULATORY INFORMATION

Canada Prohibited Toxic Substances, Schedule 2, Concentration Limits (English)  
CODEX General Standard for Food Additives (GSFA) - Additives Permitted for Use in Food in General, Unless Otherwise Specified, in Accordance with GMP  
IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk  
International Agency for Research on Cancer (IARC) Carcinogens  
International Council of Chemical Associations (ICCA) - High Production Volume List  
International Maritime Dangerous Goods Requirements (IMDG Code) - Goods Forbidden for Transport  
Mexico Maximum Permissible Exposure Limits  
OECD Representative List of High Production Volume (HPV) Chemicals  
United Nations List of Precursors and Chemicals Frequently used in the Illicit Manufacture of Narcotic Drugs and Psychotropic Substances Under International Control - Table II  
US - Arizona Ambient Air Quality Guidelines  
US - California Air Toxics "Hot Spots" List (Assembly Bill 2588) Substances for which emissions must be quantified  
US - California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List  
US - California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELs)  
US - California OEHHA/ARB - Chronic Reference Exposure Levels and Target Organs (CRELs)  
US - California Permissible Exposure Limits for Chemical Contaminants  
US - California Toxic Air Contaminant List Category II  
US - Connecticut Hazardous Air Pollutants  
US - Hawaii Air Contaminant Limits  
US - Idaho - Limits for Air Contaminants  
US - Minnesota Hazardous Substance List  
US - Minnesota Permissible Exposure Limits (PELs)  
US - New Jersey Right to Know Hazardous Substances  
US - New Jersey Right to Know Hazardous Substances (Spanish)  
US - Oregon Hazardous Materials  
US - Rhode Island Hazardous Substance List  
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants  
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants  
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants  
US - Washington Permissible exposure limits of air contaminants  
US - Wisconsin Hazardous Air Contaminants With Acceptable Ambient Concentrations  
US - Wyoming List of Highly Hazardous Chemicals, Toxics and Reactives  
US ACGIH Carcinogens Listing  
US ACGIH Threshold Limit Values (TLV)  
US AIHA Emergency Response Planning Guides (ERPGs)  
US CAA (Clean Air Act) 112 (r) List of Regulated Toxic & Flammable Substances and Threshold Quantities for Accidental Release Prevention  
US CERCLA List of Hazardous Substances and Reportable Quantities  
US Clean Air Act - Hazardous Air Pollutants  
US CWA (Clean Water Act) - List of Hazardous Substances  
US CWA (Clean Water Act) - Reportable Quantities of Designated Hazardous Substances  
US Department of Transportation (DOT) List of Hazardous Substances and Reportable Quantities - Hazardous Substances Other Than Radionuclides  
US DOE Temporary Emergency Exposure Limits (TEELs)  
US Drug Enforcement Administration (DEA) List II or Essential Chemicals  
US Drug Enforcement Administration (DEA) Thresholds for Regulated Transactions in List II Chemicals  
US EPA Acute Exposure Guideline Levels (AEGs) - Final  
US EPA Hazardous Substances  
US EPA High Production Volume Chemicals Additional List  
US EPA High Production Volume Program Chemical List

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US EPA List of Regulated Toxic Substances and Threshold Quantities for Accidental Release Prevention  
US EPCRA Section 313 Chemical List For Reporting Year 2004  
US Food Additive Database  
US NFPA 45 Fire Protection for Laboratories Using Chemicals - Flammability Characteristics of Common Compressed and Liquefied Gases  
US NIOSH Recommended Exposure Limits (RELs)  
US OSHA List of Highly Hazardous Chemicals, Toxics and Reactives  
US OSHA Permissible Exposure Levels (PELs) - Table Z1  
US SARA Section 302 Extremely Hazardous Substances  
US Toxic Substances Control Act (TSCA) - Inventory  
WHO Guidelines for Drinking-water Quality - Chemicals for which guideline values have not been established

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## Section 16 - OTHER INFORMATION

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Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

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## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

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### PRODUCT NAME

LIQUID AMMONIA TEST SOLUTION #1

### STATEMENT OF HAZARDOUS NATURE

**CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.**

### SUPPLIER

Company: Aquarium Pharmaceuticals Inc  
Address:  
PO Box 218  
Chalfont  
PA, 18914- 0218  
USA  
Telephone: +1 215 822 8181  
Emergency Tel: +1800 222 1222 (US Only)

Company: Aquarium Pharmaceuticals Inc  
Address:  
50 East Hamilton Street  
Chalfont  
PA, 18914  
USA  
Telephone: +1 215 822 8181  
Fax: +1 215 822 1906

### PRODUCT USE

Ammonia test solution for product LR8600, 34 and 401M.

### SYNONYMS

"Solution ID# 3335A"

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## Section 2 - HAZARDS IDENTIFICATION

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### CANADIAN WHMIS SYMBOLS



### EMERGENCY OVERVIEW

#### RISK

Ingestion may produce health damage\*.  
Cumulative effects may result following exposure\*.  
Possible respiratory sensitizer\*.  
Possible skin sensitizer\*.  
May be harmful to the fetus/ embryo\*.

### POTENTIAL HEALTH EFFECTS

#### ACUTE HEALTH EFFECTS

#### SWALLOWED

Accidental ingestion of the material may be damaging to the health of the individual.  
Large oral doses of salicylates may cause mild burning pain in the throat, stomach and

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usually prompt vomiting. Several hours may elapse before the development of deep and rapid breathing, lassitude, anorexia, nausea, vomiting, thirst and occasional diarrhoea. Common derivatives of salicylic acid produce substantially the same toxic syndrome, ("salicylism"). Major signs and symptoms arise from stimulation and terminal depression of the central nervous system. Stimulation produces vomiting, hyperpnea (abnormal increase in rate and depth of respiration), headache, tinnitus (ringing in the ears) confusion, bizarre behaviour or mania, generalised convulsions. Death is due to respiratory failure or cardiovascular collapse. Severe sensory disturbances such as deafness and dimness of vision are common. Less common features include sweating, skin eruptions, gastrointestinal and other hemorrhages, renal failure and pancreatitis. A tendency to bleed may be manifest by blood in the vomitus (haematemesis), bloody stools (melena) or purplish-red spots (petechiae) on the skin. Many of the toxic effects detailed here are due to or aggravated by severe disturbance of acid-base balance with the chief cause being prolonged hyperventilation from central stimulation. An assessment of acute salicylate intoxication based on dose suggests; 500 mg/mg: Potentially lethal.

## EYE

Although the liquid is not thought to be an irritant (as classified by EC Directives), direct contact with the eye may produce transient discomfort characterised by tearing or conjunctival redness (as with windburn).

## SKIN

The material is not thought to produce adverse health effects or skin irritation following contact (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.

Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

## INHALED

The material is not thought to produce either adverse health effects or irritation of the respiratory tract following inhalation (as classified by EC Directives using animal models). Nevertheless, adverse systemic effects have been produced following exposure of animals by at least one other route and good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting. Not normally a hazard due to non-volatile nature of product. Inhalation hazard is increased at higher temperatures.

## CHRONIC HEALTH EFFECTS

Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.

Limited evidence shows that inhalation of the material is capable of inducing a sensitisation reaction in a significant number of individuals at a greater frequency than would be expected from the response of a normal population.

Pulmonary sensitisation, resulting in hyperactive airway dysfunction and pulmonary allergy may be accompanied by fatigue, malaise and aching. Significant symptoms of exposure may persist for extended periods, even after exposure ceases. Symptoms can be activated by a variety of nonspecific environmental stimuli such as automobile exhaust, perfumes and passive smoking.

There exists limited evidence that shows that skin contact with the material is capable either of inducing a sensitisation reaction in a significant number of individuals, and/or of producing positive response in experimental animals.

There is some evidence that human exposure to the material may result in developmental toxicity. This evidence is based on animal studies where effects have been observed in the absence of marked maternal toxicity, or at around the same dose levels as other toxic effects but which are not secondary non-specific consequences of the other toxic effects. Chronic exposure to the salicylates (o-hydroxybenzoates) may produce metabolic and central system disturbances or damage to the kidneys. Persons with pre-existing skin

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disorders, eye problems or impaired kidney function may be more susceptible to the effects of these substances. Certain individuals (atopics), notably asthmatics, exhibit significant hyper-sensitivity to salicylic acid derivatives. Reactions include urticaria and other skin eruptions, rhinitis and severe (even fatal) bronchospasm and dyspnea. Chronic exposure to the p-hydroxybenzoates (parabens) is associated with hypersensitivity reactions following application of these to the skin. Hypersensitivity reactions have also been reported following parenteral or oral administration. Cross-sensitivity occurs between the p-hydroxybenzoates. Hypersensitivity reactions may include by acute bronchospasm, hives (urticaria), deep dermal wheals (angioneurotic oedema), running nose (rhinitis) and blurred vision. Anaphylactic shock and skin rash (non-thrombocytopenic purpura) may also occur. Any individual may be predisposed to such anti-body mediated reaction if other chemical agents have caused prior sensitisation (cross-sensitivity).

## Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
polyethylene glycol	25322-68-3	<90
sodium salicylate	54-21-7	<10

## Section 4 - FIRST AID MEASURES

### SWALLOWED

- If swallowed do NOT induce vomiting.
- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- Observe the patient carefully.
- Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.
- Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
- Seek medical advice.

### EYE

If this product comes in contact with the eyes:

- Wash out immediately with fresh running water.
- Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- If pain persists or recurs seek medical attention.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

### SKIN

If skin contact occurs:

- Immediately remove all contaminated clothing, including footwear.
- Flush skin and hair with running water (and soap if available).
- Seek medical attention in event of irritation.

### INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Other measures are usually unnecessary.

### NOTES TO PHYSICIAN

Treat symptomatically.

for salicylate intoxication:

- Pending gastric lavage, use emetics such as syrup of Ipecac or delay gastric emptying and absorption by swallowing a slurry of activated charcoal. Do not give ipecac after

continued...

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charcoal.

- Gastric lavage with water or perhaps sodium bicarbonate solution (3%-5%). Mild alkali delays salicylate absorption from the stomach and perhaps slightly from the duodenum.
- Saline catharsis with sodium or magnesium sulfate (15-30 gm in water).
- Take an immediate blood sample for an appraisal of the patient's acid-base status. A pH determination on an anaerobic sample of arterial blood is best. An analysis of the plasma salicylate concentration should be made at the same time. Laboratory controls are almost essential for the proper management of severe salicylism.
- In the presence of an established acidosis, alkali therapy is essential, but at least in an adult, alkali should be withheld until its need is demonstrated by chemical analysis. The intensity of treatment depends on the intensity of acidosis. In the presence of vomiting, intravenous sodium bicarbonate is the most satisfactory of all alkali therapy.
- Correct dehydration and hypoglycaemia (if present) by the intravenous administration of glucose in water or in isotonic saline. The administration of glucose may also serve to remedy ketosis which is often seen in poisoned children.
- Even in patients without hypoglycaemia, infusions of glucose adequate to produce distinct hyperglycaemia are recommended to prevent glucose depletion in the brain. This recommendation is based on impressive experimental data in animals.
- Renal function should be supported by correcting dehydration and incipient shock. Overhydration is not justified. An alkaline urine should be maintained by the administration of alkali if necessary with care to prevent a severe systemic alkalosis. As long as urine remains alkaline (pH above 7.5), administration of an osmotic diuretic such as mannitol or perhaps THAM is useful, but one must be careful to avoid hypokalaemia. Supplements of potassium chloride should be included in parenteral fluids.
- Small doses of barbiturates, diazepam, paraldehyde, or perhaps other sedatives (but probably not morphine) may be required to suppress extreme restlessness and convulsions.
- For hyperpyrexia, use sponge baths.

The presence of petechiae or other signs of haemorrhagic tendency calls for a large Vitamin K dose and perhaps ascorbic acid. Minor transfusions may be necessary since bleeding in salicylism is not always due to a prothrombin effect.

· Haemodialysis and haemoperfusion have proved useful in salicylate poisoning, as have peritoneal dialysis and exchange transfusions, but alkaline diuretic therapy is probably sufficient except in fulminating cases.

[GOSSELIN, et.al.: Clinical Toxicology of Commercial Products]

The mechanism of the toxic effect involves metabolic acidosis, respiratory alkalosis, hypoglycaemia, and potassium depletion. Salicylate poisoning is characterised by extreme acid-base disturbances, electrolyte disturbances and decreased levels of consciousness.

There are differences between acute and chronic toxicity and a varying clinical picture which is dependent on the age of the patient and their kidney function. The major feature of poisoning is metabolic acidosis due to "uncoupling of oxidative phosphorylation" which produces an increased metabolic rate, increased oxygen consumption, increased formation of carbon dioxide, increased heat production and increased utilisation of glucose. Direct stimulation of the respiratory centre leads to hyperventilation and respiratory alkalosis. This leads to compensatory increased renal excretion of bicarbonate which contributes to the metabolic acidosis which may coexist or develop subsequently.

Hypoglycaemia may occur as a result of increased glucose demand, increased rates of tissue glycolysis, and impaired rate of glucose synthesis. NOTE: Tissue glucose levels may be lower than plasma levels. Hyperglycaemia may occur due to increased glycogenolysis. Potassium depletion occurs as a result of increased renal excretion as well as intracellular movement of potassium.

Salicylates competitively inhibit vitamin K dependent synthesis of factors II, VII, IX, X and in addition, may produce a mild dose dependent hepatitis. Salicylates are bound to albumin. The extent of protein binding is concentration dependent (and falls with higher blood levels). This, and the effects of acidosis, decreasing ionisation, means that the volume of distribution increases markedly in overdose as does CNS penetration. The extent of protein binding (50-80%) and the rate of metabolism are concentration dependent. Hepatic clearance has zero order kinetics and thus the therapeutic half-life of 2-4.5 hours but the half-life in overdose is 18-36 hours. Renal excretion is the most important

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route in overdose. Thus when the salicylate concentrations are in the toxic range there is increased tissue distribution and impaired clearance of the drug.  
HyperTox 3.0 <http://www.ozemail.com.au/-ouad/SALI0001.HTA>.

## Section 5 - FIRE FIGHTING MEASURES

Flash Point (°F): Not Applicable  
Lower Explosive Limit (%): Not Applicable  
Upper Explosive Limit (%): Not Applicable  
Autoignition Temp (°F): Not Applicable

### EXTINGUISHING MEDIA

- Water spray or fog.
- Foam.
- Dry chemical powder.
- BCF (where regulations permit).
- Carbon dioxide.

### FIRE FIGHTING

- Alert Fire Brigade and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Use water delivered as a fine spray to control fire and cool adjacent area.
- Avoid spraying water onto liquid pools.
- DO NOT approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.

### GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

- Combustible.
- Slight fire hazard when exposed to heat or flame.
- Heating may cause expansion or decomposition leading to violent rupture of containers.
- On combustion, may emit toxic fumes of carbon monoxide (CO).
- May emit acrid smoke.
- Mists containing combustible materials may be explosive.

Combustion products include: carbon dioxide (CO<sub>2</sub>), other pyrolysis products typical of burning organic material.

May emit poisonous fumes.

May emit corrosive fumes.

### FIRE INCOMPATIBILITY

Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result.

### PERSONAL PROTECTION

Glasses:

Safety Glasses.

Chemical goggles.

Gloves:

PVC chemical resistant type.

Respirator:

continued...

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## Section 6 - ACCIDENTAL RELEASE MEASURES

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### MINOR SPILLS

- Remove all ignition sources.
- Clean up all spills immediately.
- Avoid breathing vapours and contact with skin and eyes.
- Control personal contact by using protective equipment.
- Contain and absorb spill with sand, earth, inert material or vermiculite.
- Wipe up.
- Place in a suitable labelled container for waste disposal.

### MAJOR SPILLS

Moderate hazard.

- Clear area of personnel and move upwind.
- Alert Fire Brigade and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or water course.
- No smoking, naked lights or ignition sources.
- Increase ventilation.
- Stop leak if safe to do so.
- Contain spill with sand, earth or vermiculite.
- Collect recoverable product into labelled containers for recycling.
- Absorb remaining product with sand, earth or vermiculite.
- Collect solid residues and seal in labelled drums for disposal.
- Wash area and prevent runoff into drains.
- If contamination of drains or waterways occurs, advise emergency services.

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## Section 7 - HANDLING AND STORAGE

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### PROCEDURE FOR HANDLING

DO NOT allow clothing wet with material to stay in contact with skin.

DO NOT USE brass or copper containers / stirrers.

- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- Prevent concentration in hollows and sumps.
- DO NOT enter confined spaces until atmosphere has been checked.
- Avoid smoking, naked lights or ignition sources.
- Avoid contact with incompatible materials.
- When handling, DO NOT eat, drink or smoke.
- Keep containers securely sealed when not in use.
- Avoid physical damage to containers.
- Always wash hands with soap and water after handling.
- Work clothes should be laundered separately.
- Use good occupational work practice.
- Observe manufacturer's storing and handling recommendations.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions.

### RECOMMENDED STORAGE METHODS

- Metal can or drum
- Packaging as recommended by manufacturer.
- Check all containers are clearly labelled and free from leaks.

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## STORAGE REQUIREMENTS

- Store in original containers.
- Keep containers securely sealed.
- No smoking, naked lights or ignition sources.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storing and handling recommendations.

## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

### EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m <sup>3</sup>	STEL ppm	STEL mg/m <sup>3</sup>	Peak ppm	Peak mg/m <sup>3</sup>	TWA F/CC
Canada - Saskatchewan Occupational Health and Safety Regulations - Contaminant Limits	polyethylene glycol (Respirable size+)		3		6			
Canada - Saskatchewan Occupational Health and Safety Regulations - Contaminant Limits	polyethylene glycol (Particulates, NOC++)		10		20			
Canada - British Columbia Occupational Exposure Limits	polyethylene glycol (Particles Insoluble or Poorly Soluble) Not Otherwise Classified (PNOC))		10					

The following materials had no OELs on our records

- sodium salicylate: CAS:54- 21- 7

### MATERIAL DATA

Not available. Refer to individual constituents.

### INGREDIENT DATA

POLYETHYLENE GLYCOL:

continued...

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

For powdered forms:

The polyethylene glycols are extremely low in oral toxicity, are not significantly irritating to the eyes or skin, and are not absorbed through the skin in toxic amounts. vapour pressures are extremely low and inhalation exposure is limited to mists. Based on experimental data and human experience, these substances do not present significant hazards to health in the workplace.

SODIUM SALICYLATE:

CEL TWA: 5 mg/m<sup>3</sup> [as analogue for aspirin]

### PERSONAL PROTECTION

#### EYE

- Safety glasses with side shields.
- Chemical goggles.
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59].

#### HANDS/FEET

Wear chemical protective gloves, eg. PVC.

Wear safety footwear or safety gumboots, eg. Rubber.

NOTE: The material may produce skin sensitisation in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact.

Suitability and durability of glove type is dependent on usage. Factors such as:

- frequency and duration of contact,
- chemical resistance of glove material,
- glove thickness and
- dexterity,

are important in the selection of gloves.

#### OTHER

- Overalls.
- P.V.C. apron.
- Barrier cream.
- Skin cleansing cream.
- Eye wash unit.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.

Use appropriate NIOSH-certified respirator based on informed professional judgement. In conditions where no reasonable estimate of exposure can be made, assume the exposure is in a concentration IDLH and use NIOSH-certified full face pressure demand SCBA with a minimum service life of 30 minutes, or a combination full facepiece pressure demand SAR with auxiliary self-contained air supply. Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

### ENGINEERING CONTROLS

General exhaust is adequate under normal operating conditions. If risk of overexposure exists, wear SAA approved respirator. Correct fit is essential to obtain adequate protection. Provide adequate ventilation in warehouse or closed storage areas.

## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

### PHYSICAL PROPERTIES

Liquid.  
Mixes with water.

Molecular Weight: Not Applicable

Melting Range (°F): Not Available

Solubility in water (g/L): Miscible

pH (1% solution): Not Available

Volatile Component (%vol): Not Available

Relative Vapor Density (air=1): Not Available

Lower Explosive Limit (%): Not Applicable

Autoignition Temp (°F): Not Applicable

State: Liquid

Boiling Range (°F): Not Available

Specific Gravity (water= 1): 1.152

pH (as supplied): 8.3

Vapor Pressure (mmHg): Not Available

Evaporation Rate: Not Available

Flash Point (°F): Not Applicable

Upper Explosive Limit (%): Not Applicable

Decomposition Temp (°F): Not Available

Viscosity: Not Available

### APPEARANCE

Reddish-orange liquid with a mild odour; mixes with water.

## Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

### CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerisation will not occur.

### STORAGE INCOMPATIBILITY

Avoid reaction with oxidising agents.

## Section 11 - TOXICOLOGICAL INFORMATION

### Liquid Ammonia Test Solution #1

### TOXICITY AND IRRITATION

The material may be irritating to the eye, with prolonged contact causing inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

The material may cause skin irritation after prolonged or repeated exposure and may produce a contact dermatitis (nonallergic). This form of dermatitis is often characterised by skin redness (erythema) and swelling epidermis. Histologically there may be intercellular oedema of the spongy layer (spongiosis) and intracellular oedema of the epidermis.

POLYETHYLENE GLYCOL:

TOXICITY

Oral (rat) LD50: 33750 mg/kg

for molecular weights (200-8000) \*

IRRITATION

Skin (rabbit): 500mg/24h - mild.

Eye (rabbit): 500mg/24h - mild.

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Section 11 - TOXICOLOGICAL INFORMATION

Oral (rat) LD50: 31000->50000 mg/kg  
Oral (mice) LD50: 38000->50000 mg/kg  
Oral (g.pig) LD50: 17000->50000 mg/kg  
Oral (rabbit) LD50: 14000->50000 mg/kg  
Intraperitoneal (mice) LD50: 3100-12900 mg/kg

\* AIHA WEEL Guides

## SODIUM SALICYLATE:

### TOXICITY

Oral (human) LDLo: 700 mg/kg

Oral (rat) LD50: 1200 mg/kg

Intraperitoneal (rat) LD50: 542 mg/kg

Subcutaneous (rat) LD50: 980 mg/kg

Exposure to the material for prolonged periods may cause physical defects in the developing embryo (teratogenesis).

### IRRITATION

Nil Reported

## Section 12 - ECOLOGICAL INFORMATION

DO NOT discharge into sewer or waterways.  
Refer to data for ingredients, which follows:

### POLYETHYLENE GLYCOL:

BOD 5 if unstated: 0-0.02,1%

COD: 1.62-1.74,98%

Toxicity Fish: TLm(96)>10000mg/L

## Section 13 - DISPOSAL CONSIDERATIONS

### Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.

DO NOT allow wash water from cleaning or process equipment to enter drains.

It may be necessary to collect all wash water for treatment before disposal.

In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first. Where in doubt contact the responsible authority.

- Recycle wherever possible or consult manufacturer for recycling options.
- Consult State Land Waste Authority for disposal.
- Bury or incinerate residue at an approved site.
- Recycle containers if possible, or dispose of in an authorised landfill.

Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.

A Hierarchy of Controls seems to be common - the user should investigate:

- Reduction,
- Reuse
- Recycling
- Disposal (if all else fails)

This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. If it has been contaminated, it may be possible to reclaim the product by filtration, distillation or some other means. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.

continued...

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## Section 14 - TRANSPORTATION INFORMATION

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NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS:UN, IATA,  
IMDG

---

## Section 15 - REGULATORY INFORMATION

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### REGULATIONS

polyethylene glycol (CAS: 25322-68-3) is found on the following regulatory lists;  
Canada - British Columbia Occupational Exposure Limits  
Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits  
Canada Domestic Substances List (DSL)  
IMO MARPOL 73/78 (Annex II) - List of Other Liquid Substances  
US - Minnesota Hazardous Substance List  
US Cosmetic Ingredient Review (CIR) Cosmetic ingredients found safe, with qualifications  
US DOE Temporary Emergency Exposure Limits (TEELs)  
US DOT Coast Guard Bulk Hazardous Materials - List of Flammable and Combustible Bulk Liquid Cargoes  
US EPA High Production Volume Program Chemical List  
US Food Additive Database  
US Premarket Notifications for Food Contact Substances  
US Toxic Substances Control Act (TSCA) - Inventory

sodium salicylate (CAS: 54-21-7) is found on the following regulatory lists;  
Canada Domestic Substances List (DSL)  
Canada Environmental Quality Guidelines (EQGs) Water: Aquatic life  
IMO MARPOL 73/78 (Annex II) - List of Other Liquid Substances  
US - California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List  
US Cosmetic Ingredient Review (CIR) Cosmetic ingredients found safe, with qualifications  
US DOE Temporary Emergency Exposure Limits (TEELs)  
US EPA High Production Volume Program Chemical List  
US Toxic Substances Control Act (TSCA) - Inventory

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## Section 16 - OTHER INFORMATION

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### LIMITED EVIDENCE

Ingestion may produce health damage\*.  
Cumulative effects may result following exposure\*.  
Possible respiratory sensitiser\*.  
Possible skin sensitiser\*.  
May be harmful to the foetus/ embryo\*.  
\* (limited evidence).

### EXPOSURE STANDARD FOR MIXTURES

"Worst Case" computer-aided prediction of spray/ mist or fume/ dust components and concentration:

Composite Exposure Standard for Mixture (TWA) :5 mg/m<sup>3</sup>.

Operations which produce a spray/mist or fume/dust, introduce particulates to the breathing zone.

If the breathing zone concentration of ANY of the components listed below is exceeded,

continued...

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Section 16 - OTHER INFORMATION

"Worst Case" considerations deem the individual to be overexposed.

Component	Breathing Zone ppm	Breathing Zone mg/m <sup>3</sup>	Mixture Conc (%)
-----------	--------------------	----------------------------------	------------------

Component	Breathing Zone (mg/m <sup>3</sup> )	Mixture Conc (%)
sodium salicylate	5.0000	10.0

*Reasonable care has been taken in the preparation of this information, but the author makes no warranty of merchantability or any other warranty, expressed or implied, with respect to this information. The author makes no representations and assumes no liability for any direct, incidental or consequential damages resulting from its use. CHEMTREC: (800) 424- 9300*

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# LIQUID AMMONIA TEST SOLUTION #2

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## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

### PRODUCT NAME

LIQUID AMMONIA TEST SOLUTION #2

### STATEMENT OF HAZARDOUS NATURE

**CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.**

### SUPPLIER

Company: Aquarium Pharmaceuticals Incorporated  
Address:  
50 East Hamilton Street  
Chalfont  
PA, 18914  
USA  
Telephone: +1 215 822 8181

Company: Aquarium Pharmaceuticals Incorporated  
Address:  
PO Box 218  
Chalfont  
PA, 18914-0218  
USA  
Telephone: +1 215 822 8181  
Emergency Tel: +1800 222 1222 (US Only)

### PRODUCT USE

Ammonia test solution for product LR8600, 34 and 401M.

### SYNONYMS

"Solution ID# 3335B"

## Section 2 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
sodium hydroxide	1310-73-2	<10
sodium hypochlorite	7681-52-9	<1

## Section 3 - HAZARDS IDENTIFICATION

### CANADIAN WHMIS SYMBOLS



### EMERGENCY OVERVIEW

#### RISK

Causes severe burns.  
Risk of serious damage to eyes.  
Harmful to aquatic organisms.  
Ingestion may produce health damage\*.  
\*(limited evidence)

continued...

# LIQUID AMMONIA TEST SOLUTION #2

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Section 3 - HAZARDS IDENTIFICATION

Cumulative effects may result following exposure\*.

## POTENTIAL HEALTH EFFECTS

### ACUTE HEALTH EFFECTS

#### SWALLOWED

Accidental ingestion of the material may be damaging to the health of the individual.

The material can produce severe chemical burns within the oral cavity and gastrointestinal tract following ingestion.

Ingestion of alkaline corrosives may produce burns around the mouth, ulcerations and swellings of the mucous membranes, profuse saliva production, with an inability to speak or swallow. Both the esophagus and stomach may experience burning pain; vomiting and diarrhea may follow. Epiglottal swelling may result in respiratory distress and asphyxia; shock can occur. Narrowing of the esophagus, stomach or stomach valve may occur immediately or after a long delay (weeks to years). Severe exposure can perforate the esophagus or stomach leading to infections of the chest or abdominal cavity, with low chest pain, abdominal stiffness and fever. All of the above can cause death.

#### EYE

The material can produce severe chemical burns to the eye following direct contact. Vapors or mists may be extremely irritating.

If applied to the eyes, this material causes severe eye damage.

Direct eye contact with corrosive bases can cause pain and burns. There may be swelling, epithelium destruction, clouding of the cornea and inflammation of the iris. Mild cases often resolve; severe cases can be prolonged with complications such as persistent swelling, scarring, permanent cloudiness, bulging of the eye, cataracts, eyelids glued to the eyeball and blindness.

#### SKIN

The material can produce severe chemical burns following direct contact with the skin.

Skin contact with alkaline corrosives may produce severe pain and burns; brownish stains may develop. The corroded area may be soft, gelatinous and necrotic; tissue destruction may be deep.

Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

#### INHALED

If inhaled, this material can irritate the throat and lungs of some persons.

Inhaling corrosive bases may irritate the respiratory tract. Symptoms include cough, choking, pain and damage to the mucous membrane. In severe cases, lung swelling may develop, sometimes after a delay of hours to days. There may be low blood pressure, a weak and rapid pulse, and crackling sounds.

#### CHRONIC HEALTH EFFECTS

Repeated or prolonged exposure to corrosives may result in the erosion of teeth, inflammatory and ulcerative changes in the mouth and necrosis (rarely) of the jaw. Bronchial irritation, with cough, and frequent attacks of bronchial pneumonia may ensue. Gastrointestinal disturbances may also occur. Chronic exposures may result in dermatitis and/or conjunctivitis. Substance

continued...

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Section 3 - HAZARDS IDENTIFICATION

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accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure.

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## Section 4 - FIRST AID MEASURES

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### SWALLOWED

- For advice, contact a Poisons Information Center or a doctor at once.
- Urgent hospital treatment is likely to be needed.
- If swallowed do NOT induce vomiting.
- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- Observe the patient carefully.
- Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.
- Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
- Transport to hospital or doctor without delay.

### EYE

If this product comes in contact with the eyes:

- Immediately hold eyelids apart and flush the eye continuously with running water.
- Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- Continue flushing until advised to stop by the Poisons Information Center or a doctor, or for at least 15 minutes.
- Transport to hospital or doctor without delay.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

### SKIN

If skin or hair contact occurs:

- Immediately flush body and clothes with large amounts of water, using safety shower if available.
- Quickly remove all contaminated clothing, including footwear.
- Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Center.
- Transport to hospital, or doctor.

### INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Lay patient down. Keep warm and rested.
- Prosthesis such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
- Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
- Transport to hospital, or doctor, without delay.

### NOTES TO PHYSICIAN

For acute or short-term repeated exposures to highly alkaline materials:

- Respiratory stress is uncommon but present occasionally because of soft tissue edema.
- Unless endotracheal intubation can be accomplished under direct vision,

continued...

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Section 4 - FIRST AID MEASURES

cricothyroidotomy or tracheotomy may be necessary.  
- Oxygen is given as indicated.  
- The presence of shock suggests perforation and mandates an intravenous line and fluid administration.  
- Damage due to alkaline corrosives occurs by liquefaction necrosis whereby the saponification of fats and solubilization of proteins allow deep penetration into the tissue.  
Alkalis continue to cause damage after exposure.

### INGESTION:

- Milk and water are the preferred diluents  
No more than 2 glasses of water should be given to an adult.  
- Neutralizing agents should never be given since exothermic heat reaction may compound injury.  
\* Catharsis and emesis are absolutely contra-indicated.  
\* Activated charcoal does not absorb alkali.  
\* Gastric lavage should not be used.

Supportive care involves the following:

- Withhold oral feedings initially.  
- If endoscopy confirms transmucosal injury start steroids only within the first 48 hours.  
- Carefully evaluate the amount of tissue necrosis before assessing the need for surgical intervention.  
- Patients should be instructed to seek medical attention whenever they develop difficulty in swallowing (dysphagia).

### SKIN AND EYE:

- Injury should be irrigated for 20-30 minutes.  
- Eye injuries require saline. [Ellenhorn & Barceloux: Medical Toxicology].

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## Section 5 - FIRE FIGHTING MEASURES

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Flash Point (°F): Not Applicable  
Lower Explosive Limit (%): Not Applicable  
Upper Explosive Limit (%): Not Applicable  
Autoignition Temp (°F): Not Applicable

### EXTINGUISHING MEDIA

- Water spray or fog.  
- Foam.  
- Dry chemical powder.  
- BCF (where regulations permit).  
- Carbon dioxide.

### FIRE FIGHTING

- Alert Emergency Responders and tell them location and nature of hazard.  
- Wear full body protective clothing with breathing apparatus.  
- Prevent, by any means available, spillage from entering drains or water course.  
- Use fire fighting procedures suitable for surrounding area.  
- DO NOT approach containers suspected to be hot.  
- Cool fire exposed containers with water spray from a protected location.  
- If safe to do so, remove containers from path of fire.  
- Equipment should be thoroughly decontaminated after use.

continued...

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Section 5 - FIRE FIGHTING MEASURES

When any large container (including road and rail tankers) is involved in a fire, consider evacuation by 2625 feet in all directions.

## GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

- Non combustible.
  - Not considered to be a significant fire risk, however containers may burn.
- May emit corrosive fumes.

## FIRE INCOMPATIBILITY

None known.

## Section 6 - ACCIDENTAL RELEASE MEASURES

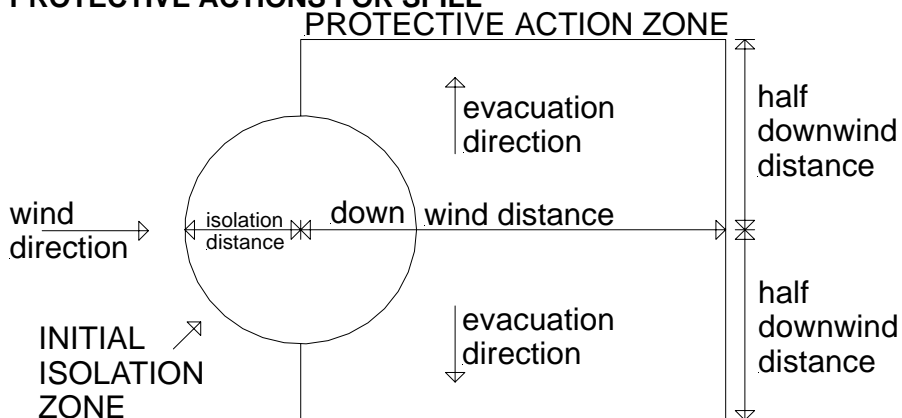
### MINOR SPILLS

- Clean up all spills immediately.
- Avoid breathing vapors and contact with skin and eyes.
- Control personal contact by using protective equipment.
- Contain and absorb spill with sand, earth, inert material or vermiculite.
- Wipe up.
- Place in a suitable labeled container for waste disposal.

### MAJOR SPILLS

- Clear area of personnel and move upwind.
- Alert Emergency Responders and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Consider evacuation.
- Stop leak if safe to do so.
- Contain spill with sand, earth or vermiculite.
- Collect recoverable product into labeled containers for recycling.
- Neutralize/decontaminate residue.
- Collect solid residues and seal in labeled drums for disposal.
- Wash area and prevent runoff into drains.
- After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.
- If contamination of drains or waterways occurs, advise emergency services.

### PROTECTIVE ACTIONS FOR SPILL



From IERG (Canada/Australia)

continued...

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## Section 6 - ACCIDENTAL RELEASE MEASURES

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Isolation Distance	25 meters
Downwind Protection Distance	250 meters

### FOOTNOTES

- 1 PROTECTIVE ACTION ZONE is defined as the area in which people are at risk of harmful exposure. This zone assumes that random changes in wind direction confines the vapour plume to an area within 30 degrees on either side of the predominant wind direction, resulting in a crosswind protective action distance equal to the downwind protective action distance.
- 2 PROTECTIVE ACTIONS should be initiated to the extent possible, beginning with those closest to the spill and working away from the site in the downwind direction. Within the protective action zone a level of vapour concentration may exist resulting in nearly all unprotected persons becoming incapacitated and unable to take protective action and/or incurring serious or irreversible health effects.
- 3 INITIAL ISOLATION ZONE is determined as an area, including upwind of the incident, within which a high probability of localised wind reversal may expose nearly all persons without appropriate protection to life-threatening concentrations of the material.
- 4 SMALL SPILLS involve a leaking package of 200 litres (55 US gallons) or less, such as a drum (jerrican or box with inner containers). Larger packages leaking less than 200 litres and compressed gas leaking from a small cylinder are also considered "small spills".  
LARGE SPILLS involve many small leaking packages or a leaking package of greater than 200 litres, such as a cargo tank, portable tank or a "one-tonne" compressed gas cylinder.
- 5 Guide 154 is taken from the US DOT emergency response guide book.
- 6 IERG information is derived from CANUTEC - Transport Canada.

### ACUTE EXPOSURE GUIDELINE LEVELS (AEGL) (in ppm)

AEGL 1: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure.

AEGL 2: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.

AEGL 3: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience life-threatening health effects or death.

### EMERGENCY RESPONSE PLANNING GUIDELINES (ERPG)

The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour WITHOUT experiencing or developing

life-threatening health effects is:

sodium hydroxide	50 mg/m <sup>3</sup>
sodium hypochlorite	500 mg/m <sup>3</sup>

irreversible or other serious effects or symptoms which could impair an individual's ability to take protective action is:

continued...

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Section 6 - ACCIDENTAL RELEASE MEASURES

sodium hydroxide 5 mg/m<sup>3</sup>  
sodium hypochlorite 500 mg/m<sup>3</sup>

other than mild, transient adverse effects  
without perceiving a clearly defined odour is:

sodium hydroxide 0.5 mg/m<sup>3</sup>  
sodium hypochlorite 75 mg/m<sup>3</sup>

The threshold concentration below which most people  
will experience no appreciable risk of health effects:

sodium hydroxide 0.5 mg/m<sup>3</sup>  
sodium hypochlorite 25 mg/m<sup>3</sup>

American Industrial Hygiene Association (AIHA)

Ingredients considered according exceed the following cutoffs

Very Toxic (T+) >= 0.1%	Toxic (T) >= 3.0%
R50 >= 0.25%	Corrosive (C) >= 5.0%
R51 >= 2.5%	
else >= 10%	

where percentage is percentage of ingredient found in the mixture

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## Section 7 - HANDLING AND STORAGE

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### PROCEDURE FOR HANDLING

- Avoid all personal contact, including inhalation.
  - Wear protective clothing when risk of exposure occurs.
  - Use in a well-ventilated area.
  - WARNING: To avoid violent reaction, ALWAYS add material to water and NEVER water to material.
  - Avoid smoking, naked lights or ignition sources.
  - Avoid contact with incompatible materials.
  - When handling, DO NOT eat, drink or smoke.
  - Keep containers securely sealed when not in use.
  - Avoid physical damage to containers.
  - Always wash hands with soap and water after handling.
  - Work clothes should be laundered separately.
  - Launder contaminated clothing before re-use.
  - Use good occupational work practice.
  - Observe manufacturer's storing and handling recommendations.
  - Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.
- DO NOT allow clothing wet with material to stay in contact with skin.

### RECOMMENDED STORAGE METHODS

- Lined metal can, Lined metal pail/drum
- Plastic pail
- Polyliner drum
- Packing as recommended by manufacturer.
- Check all containers are clearly labeled and free from leaks.

For low viscosity materials

- Drums and jerricans must be of the non-removable head type.
- Where a can is to be used as an inner package, the can must have a screwed enclosure.

continued...

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Section 7 - HANDLING AND STORAGE

For materials with a viscosity of at least 2680 cSt. (23 deg. C) and solids (between 15 C deg. and 40 deg C.):

- Removable head packaging;
- Cans with friction closures and
- low pressure tubes and cartridges may be used.

Where combination packages are used, and the inner packages are of glass, porcelain or stoneware, there must be sufficient inert cushioning material in contact with inner and outer packages unless the outer packaging is a close fitting molded plastic box and the substances are not incompatible with the plastic.

## STORAGE REQUIREMENTS

- Store in original containers.
  - Keep containers securely sealed.
  - Store in a cool, dry, well-ventilated area.
  - Store away from incompatible materials and foodstuff containers.
  - Protect containers against physical damage and check regularly for leaks.
  - Observe manufacturer's storing and handling recommendations.
- DO NOT store near acids, or oxidizing agents.  
Protect containers against physical damage.  
Check regularly for spills and leaks.  
No smoking, naked lights, heat or ignition sources.

## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

### EXPOSURE CONTROLS

US OSHA Permissible Exposure Levels ( PELs)

Z	Material	TWA ppm	TWA mg/m <sup>3</sup>	STEL ppm	STEL mg/m <sup>3</sup>	Peak ppm	Peak mg/m <sup>3</sup>	Max excursion ppm	Max excursion mg/m <sup>3</sup>	Max excursion duration (mins)
Z1	Sodium hydroxide		2							

Source	Material	TWA ppm	TWA mg/m <sup>3</sup>	STEL ppm	STEL mg/m <sup>3</sup>	Peak ppm	Peak mg/m <sup>3</sup>
US California Permissible Exposure Limits for Chemical Contaminants	Sodium hydroxide; caustic soda					--	2
US Minnesota Permissible Exposure Limits (PELs)	Sodium hydroxide						2
US Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants	Sodium hydroxide		2				
US Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	Sodium hydroxide						2

continued...

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

US Tennessee Occupational Exposure Limits - Limits For Air Contaminants	Sodium hydroxide				2
Canada Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	Sodium hydroxide				2.00000
Canada Yukon Permissible Concentrations for Airborne Contaminant Substances	Sodium hydroxide	-	2	-	-
US Washington Permissible exposure limits of air contaminants	Sodium hydroxide				2
Canadian British Columbia Occupational Exposure Limits	Sodium hydroxide				2
NIOSH Recommended Exposure Limits for Hazardous Agents in the Workplace	Sodium hydroxide				2
US AIHA Workplace Environmental Exposure Levels (WEELs)	Sodium Hypochlorite				2
No data available: sodium hypochlorite as (CAS: 10022-70-5)					

Not available. Refer to individual constituents.

### EXPOSURE STANDARDS FOR MIXTURE

"Worst Case" computer-aided prediction of vapour components/concentrations:

"Worst Case" computer-aided prediction of vapour components/concentrations:  
 Composite Exposure Standard for Mixture (TWA) (mg/m<sup>3</sup>): 1.5 mg/m<sup>3</sup>

"Worst Case" computer-aided prediction of vapour components/concentrations:  
 Composite Exposure Standard for Mixture (TWA) (mg/m<sup>3</sup>):

If the breathing zone concentration of ANY of the components listed below is exceeded, "Worst Case" considerations deem the individual to be overexposed.  
 Component Breathing Zone ppm Breathing Zone mg/m<sup>3</sup> Mixture Conc: (%)

Component	Breathing zone (ppm)	Breathing Zone (mg/m <sup>3</sup> )	Mixture Conc (%)
sodium hypochlorite	0.50	1.5000	1.0

### INGREDIENT DATA

#### SODIUM HYDROXIDE:

The TLV-C is recommended based on concentrations that produce noticeable but not excessive, ocular and upper respiratory tract irritation.

#### SODIUM HYPOCHLORITE:

available chlorine, as chlorine  
 TLV TWA: 0.5 ppm, 1.5 mg/m<sup>3</sup>; STEL: 1 ppm, 2.9 mg/m<sup>3</sup>  
 ES Peak: 1 ppm, 3 mg/m<sup>3</sup>  
 CEL TWA: 2 mg/m<sup>3</sup> (compare WEEL TWA)

The odour threshold is likely to be similar to that of chlorine, 0.3 ppm.  
 Acute, subchronic, and chronic toxicity studies have shown no significant treatment related effects. High concentrations may produce moderate to

continued...

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

severe eye irritation, but not permanent injury. High doses also appear to be embryotoxic. Since nearly all sodium hypochlorite is handled as aqueous solution, airborne exposure is likely to be as an aerosol, or mist. Sodium hypochlorite dissociates in water to form free hypochlorous acid in equilibrium. The toxic effects are likely to be similar to those of chlorine or sodium hydroxide.

### PERSONAL PROTECTION

Glasses:  
Full face- shield.  
Gloves:  
PE/EVAL/PE Gloves.  
Respirator:  
Type B-P Filter of sufficient capacity

### EYE

- Chemical goggles.
- Full face shield.
- Contact lenses pose a special hazard; soft contact lenses may absorb irritants and all lenses concentrate them.

### HANDS/FEET

Elbow length PVC gloves.  
When handling corrosive liquids, wear trousers or overalls outside of boots, to avoid spills entering boots.

### OTHER

- Overalls.
- PVC Apron.
- PVC protective suit may be required if exposure severe.
- Eyewash unit.
- Ensure there is ready access to a safety shower.

### RESPIRATOR

Selection of the Class and Type of respirator will depend upon the level of breathing zone contaminant and the chemical nature of the contaminant. Protection Factors (defined as the ratio of contaminant outside and inside the mask) may also be important.

Breathing Zone Level ppm (volume)	Maximum Protection Factor	Half-face Respirator	Full-Face Respirator
1000	10	B-1 P-	-
1000	50	-	B-1 P-
5000	50	Airline*	-
5000	100	-	B-2 P-
10000	100	-	B-3 P-
	100+		Airline* *

\* - Continuous Flow \*\* - Continuous-flow or positive pressure demand.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.

Use appropriate NIOSH-certified respirator based on informed professional judgement. In conditions where no reasonable estimate of exposure can be made, assume the exposure is in a concentration IDLH and use NIOSH-certified

continued...

# LIQUID AMMONIA TEST SOLUTION #2

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

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full face pressure demand SCBA with a minimum service life of 30 minutes, or a combination full facepiece pressure demand SAR with auxiliary self-contained air supply. Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.

### ENGINEERING CONTROLS

Local exhaust ventilation usually required. If risk of overexposure exists, wear an approved respirator. Correct fit is essential to obtain adequate protection an approved self contained breathing apparatus (SCBA) may be required in some situations. Provide adequate ventilation in warehouse or closed storage area.

---

## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

---

### PHYSICAL PROPERTIES

Liquid.  
Mixes with water.  
Corrosive.  
Alkaline.

Molecular Weight: Not Applicable  
Melting Range (°C): Not Available  
Solubility in water (g/L): Miscible  
pH (1% solution): Not Available  
Volatile Component (%vol): Not Available  
Relative Vapor Density (air=1): Not Available  
Lower Explosive Limit (%): Not Applicable  
Autoignition Temp (°C): Not Applicable  
State: Liquid

Boiling Range (°C): Not Available  
Specific Gravity (water=1): 1.099  
pH (as supplied): 13.3-13.9  
Vapor Pressure (kPa): Not Available  
Evaporation Rate: Not Available  
Flash Point (°C): Not Applicable  
Upper Explosive Limit (%): Not Applicable  
Decomposition Temp (°C): Not Available

### APPEARANCE

Clear alkaline liquid with a chlorine odor; mixes with water.

---

## Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

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### CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerization will not occur.

### STORAGE INCOMPATIBILITY

Avoid strong acids.

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## Section 11 - TOXICOLOGICAL INFORMATION

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### Liquid Ammonia Test Solution #2

Not available. Refer to individual constituents.  
unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances

continued...

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Section 11 - TOXICOLOGICAL INFORMATION

## SODIUM HYDROXIDE:

### TOXICITY

Skin (rabbit): 500 mg/24h SEVERE  
Eye (rabbit): 0.05 mg/24h SEVERE  
Eye(rabbit):1 mg/24h SEVERE  
Eye(rabbit):1 mg/30s rinsed-SEVERE

### IRRITATION

## SODIUM HYPOCHLORITE:

### TOXICITY

Oral (mouse) LD50: 5800 mg/kg  
Oral (woman) TDLo: 1000 mg/kg  
as sodium hypochlorite pentahydrate  
Oral (rat) LD50: 8910 mg/kg  
Eye (rabbit): 100 mg - moderate

### IRRITATION

Eye (rabbit): 10 mg - Moderate

Skin (rabbit): 500 mg/24h-moderate

The substance is classified by IARC as Group 3:

NOT classifiable as to its carcinogenicity to humans.

Evidence of carcinogenicity may be inadequate or limited in animal testing.

## Section 12 - ECOLOGICAL INFORMATION

Prevent, by any means available, spillage from entering drains or water courses.

DO NOT discharge into sewer or waterways.

Refer to data for ingredients, which follows:

### SODIUM HYDROXIDE:

Toxicity Fish: LC50(96)43mg/L

### SODIUM HYPOCHLORITE:

The material is classified as an ecotoxin\* because the Fish LC50 (96 hours) is less than or equal to 0.1 mg/l

\* Classification of Substances as Ecotoxic (Dangerous to the Environment)

Appendix 8, Table 1

Compiler's Guide for the Preparation of International Chemical Safety Cards:

1993 Commission of the European Communities.

## Section 13 - DISPOSAL CONSIDERATIONS

### US EPA Waste Number & Descriptions

#### A. General Product Information

Corrosivity characteristic: use EPA hazardous waste number D002 (waste code C)

### Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.

- Recycle wherever possible.
- Consult manufacturer for recycling options or consult Waste Management Authority for disposal if no suitable treatment or disposal facility can be identified.
- Treat and neutralize at an approved treatment plant.
- Treatment should involve: Neutralization with suitable dilute acid followed

continued...

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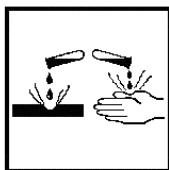
## Section 13 - DISPOSAL CONSIDERATIONS

by: Burial in a licensed land-fill or Incineration in a licensed apparatus (after admixture with suitable combustible material).  
- Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.  
Puncture containers to prevent re-use and bury at an authorized landfill.

## Section 14 - TRANSPORTATION INFORMATION

DOT Information  
Shipping Name: CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.  
Hazard Class: 8  
SubRisk: None  
UN/NA Number: 3266  
Packing Group: II  
Labels Required: corrosive  
Additional Shipping Information:  
International Transport Regulations:  
IMO: 3266

## Section 15 - REGULATORY INFORMATION



### RISK

Causes severe burns.  
Risk of serious damage to eyes.  
Harmful to aquatic organisms.

### US Federal Regulations

#### A. General Product Information

In addition to Federal and State regulation, local regulations may apply. Check with your local regulatory authorities.

#### B. Component Information

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 455 Appendix A) SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4):

-----  
sodium hydroxide (1310-73-2, <10% )  
CERCLA: final RQ = 1000 pounds (454 kg)

-----  
sodium hypochlorite (7681-52-9, <1% )  
CERCLA: final RQ = 100 pounds (45.4 kg)

Component

TSCA

continued...

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Section 15 - REGULATORY INFORMATION

sodium hydroxide Y  
sodium hypochlorite Y

## State Regulations

### A. General Product Information

### B. Component Information

The following components appear on one or more of the following state hazardous substance lists.

Component	CAS No	CA	FL	MA	MN	NJ	PA
sodium hydroxide	1310-73-2	Y	Y	Y	Y	Y	Y
sodium hypochlorite	7681-52-9	Y	N	Y	Y	N	Y

Y=Yes this material appears on that state's hazardous substances list.

N=No this material does not appear on that state's hazardous substances list.

## Other Regulations

### A. General Product Information

All components are listed in the European Inventory of New and Existing Chemical Substances (EINECS)

### B. Component Information

#### CANADA

The following component(s) are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS No	%	Min Conc.
sodium hydroxide	1310-73-2	<10	1% item 1442 (998)
sodium hypochlorite	7681-52-9	<1	1% item 1443 (1013)

All of this product's components are on the Canadian Domestic

## REGULATIONS

sodium hydroxide (CAS: 1310-73-2) is found on the following regulatory lists

Canadian Domestic Substances List (DSL)

US Toxic Substances Control Act (TSCA)

US EPA Hazardous Substances

US California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List

US CWA (Clean Water Act) - List of Hazardous Substances

US CWA (Clean Water Act) - Reportable Quantities of Designated Hazardous Substances

US Minnesota Hazardous Substance List

US EPA High Production Volume Chemicals Additional List

US Food Additive Database

Canada Yukon Permissible Concentrations for Airborne Contaminant Substances

US Connecticut Hazardous Air Pollutants

Canadian Ingredient Disclosure List (SOR/88-64)

sodium hypochlorite (CAS: 7681-52-9) is found on the following regulatory lists

Canadian Domestic Substances List (DSL)

US Toxic Substances Control Act (TSCA)

US California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List

US CWA (Clean Water Act) - List of Hazardous Substances

US CWA (Clean Water Act) - Reportable Quantities of Designated Hazardous Substances

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Section 15 - REGULATORY INFORMATION

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US Minnesota Hazardous Substance List  
Canadian Ingredient Disclosure List (SOR/88-64)  
US AIHA Workplace Environmental Exposure Levels (WEELs)  
US Food Additive Database  
US EPA Hazardous Substances  
Canadian National Pollutant Release Inventory (NPRI)  
US EPA High Production Volume Chemicals Additional List  
sodium hypochlorite (CAS: 10022-70-5) is found on the following regulatory lists  
Canadian Domestic Substances List (DSL)  
US Toxic Substances Control Act (TSCA)  
US California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List  
US CWA (Clean Water Act) - List of Hazardous Substances  
US CWA (Clean Water Act) - Reportable Quantities of Designated Hazardous Substances  
US Minnesota Hazardous Substance List  
Canadian Ingredient Disclosure List (SOR/88-64)  
US DOE Temporary Emergency Exposure Limits (TEELs)  
US AIHA Workplace Environmental Exposure Levels (WEELs)  
US Food Additive Database  
US EPA Hazardous Substances  
Canadian National Pollutant Release Inventory (NPRI)  
US EPA High Production Volume Chemicals Additional List

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### Section 16 - OTHER INFORMATION

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# GENERAL HARDNESS (GH) TEST SOLUTION

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## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

### PRODUCT NAME

GENERAL HARDNESS (GH) TEST SOLUTION

### STATEMENT OF HAZARDOUS NATURE

**CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.**

### SUPPLIER

Company: Aquarium Pharmaceuticals Incorporated  
Address:  
50 East Hamilton Street  
Chalfont  
PA, 18914  
USA  
Telephone: +1 215 822 8181

Company: Aquarium Pharmaceuticals Incorporated  
Address:  
PO Box 218  
Chalfont  
PA, 18914-0218  
USA  
Telephone: +1 215 822 8181  
Emergency Tel: +1800 222 1222 (US Only)

### PRODUCT USE

Hardness test solution for products 58 and 34.

### SYNONYMS

"Solution ID# 3338"

## Section 2 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
triethanolamine	102-71-6	10-30
EDTA tetrasodium salt	64-02-8	1-5
water	7732-18-5	>60

## Section 3 - HAZARDS IDENTIFICATION

### CANADIAN WHMIS SYMBOLS



### EMERGENCY OVERVIEW

#### RISK

Irritating to eyes.  
Harmful by inhalation, in contact with skin and if swallowed.  
Cumulative effects may result following exposure\*.

continued...

# GENERAL HARDNESS (GH) TEST SOLUTION

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Section 3 - HAZARDS IDENTIFICATION

Possible skin sensitizer\*.  
Exposure may produce irreversible effects\*.

\*(limited evidence)

## POTENTIAL HEALTH EFFECTS

### ACUTE HEALTH EFFECTS

#### SWALLOWED

Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.

There is some evidence to suggest that this material can cause, if swallowed once, irreversible damage of organs.

#### EYE

This material can cause eye irritation and damage in some persons.

#### SKIN

Skin contact with the material may be harmful; systemic effects may result following absorption.

The material is not thought to be a skin irritant (as classified using animal models). Temporary discomfort, however, may result from prolonged dermal exposures. Good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.

There is some evidence to suggest that this material, on a single contact with skin, can cause irreversible damage of organs.

Toxic effects may result from skin absorption.

Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

#### INHALED

Harmful by inhalation.

The material is not thought to produce respiratory irritation (as classified using animal models). Nevertheless inhalation of the material, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress.

Inhalation of vapors or aerosols (mists, fumes), generated by the material during the course of normal handling, may be harmful.

There is some evidence to suggest that this material can cause, if inhaled once, irreversible damage of organs.

#### CHRONIC HEALTH EFFECTS

Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure. There has been some concern that this material can cause cancer or mutations but there is not enough data to make an assessment. There is limited evidence that, skin contact with this product is more likely to cause a sensitization reaction in some persons compared to the general population. Prolonged or chronic exposure to alkanolamines may result in liver, kidney or nervous system injury. Repeated inhalation may aggravate asthma and inflammatory or fibrotic pulmonary disease. Results of repeated exposure tests with diethanolamine (DEA) in laboratory animals include anaemia (rats) and effects on the kidneys (rats and mice) and liver (mice). DEA produces nervous system injury in dogs and rats. Heart and salivary gland lesions have also been seen in mice treated cutaneously with DEA

continued...

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Section 3 - HAZARDS IDENTIFICATION

and in mice receiving DEA in drinking water. Rats given high doses of DEA developed anaemia and testicular lesions. Exaggerated doses of DEA produced heart and nervous system effects in other animals. Changes in other organs were judged to be secondary due to the poor health of animals subjected to extremely high doses of DEA. Rats, rabbits and guinea pigs exposed to high vapour concentrations of volatile monoethanolamine (MEA) (up to 1250 ppm) for periods of up to 5 weeks developed pulmonary, hepatic and renal lesions. Dogs, rats and guinea pigs exposed to 100 ppm MEA for 30 days, became apathetic and developed poor appetites. Animal tests also indicate that inhalation exposure to MEA may result in nervous system injury. All species exposed to airborne MEA experienced dermal effects, varying from ulceration to hair loss probably resulting from contact with the cage. An increased incidence of skeletal variations, suggestive of a slight developmental delay was seen in the foetuses of rats given 1500 mg/kg/day DEA cutaneously; this also produced significant maternal toxicity. No foetal malformations, however, were seen in rats nor in rabbits receiving identical treatment. The foetus of rats given high doses of MEA by gavage, showed an increased rate of embryofoetal death, growth retardation, and some malformations including hydronephrosis and hydroureter. The high doses required to produce these effects bring into question the relevance of this finding to humans. There is some evidence that embryofoetotoxicity and teratogenicity does not occur in rats when MEA is administered by dermal application to the mother. The National Toxicology Program (NTP) concluded that there is clear evidence of liver tumours and some evidence of kidney tumours in mice exposed dermally to DEA over their lifetime. Chronic skin painting studies in mice of both sexes produced liver tumours and an increased incidence of kidney tumours in male mice. The significance of these findings to humans is unclear as DEA is neither genotoxic, mutagenic nor clastogenic, and did not induce tumours in rats or transgenic mice similarly treated. Alkanolamines (especially those containing a secondary amine moiety) may react with nitrites or other nitrosating agents to form carcinogenic N-nitrosamines. Alkanolamines are metabolised by biosynthetic routes to ethanolamine and choline and incorporated into phospholipids. They are excreted predominantly unchanged with a half-life of approximately one week. In the absence of sodium nitrite, no conversion to carcinogenic N-nitrosamines was observed. Diethanolamine competitively inhibits the cellular uptake of choline, in vitro, and hepatic changes in choline homeostasis, consistent with choline deficiency, are observed in vivo. Many amines are potent skin and respiratory sensitisers and certain individuals especially those described as "atopic" (i.e. those predisposed to asthma and other allergic responses) may show allergic reactions when chronically exposed to alkanolamines. In a study with coconut diethanolamide, the National Toxicology Program (Technical Report Series 479), showed clear evidence of carcinogenic activity in male B6C3F1 mice based on increased incidences of hepatic and renal tubule neoplasms and in female B6C3F1 mice based on increased incidences of hepatic neoplasms. There was equivocal evidence of carcinogenic activity in female F344/N rats based on a marginal increase in the incidence of renal tube neoplasms. These increases were associated with the concentration of free diethanolamine present as a contaminant in the diethanolamine condensate. Exposure to rats to coconut oil diethanolamine condensate by dermal application in ethanol for 2 years resulted in epidermal hyperplasia, sebaceous gland hyperplasia, hyperkeratosis and parakeratosis in males and females and ulcer in females at the site of application. There were increases in the incidences of chronic inflammation, epithelial hyperplasia, and epithelial ulcer in the forestomach of female rats. The severity of nephropathy in dosed female rats were increased. Exposure of mice to coconut oil diethanolamine condensate by dermal application for 2 years resulted in increased incidences of eosinophilic foci of the liver in males. Increased incidences of epidermal hyperplasia, sebaceous gland hyperplasia, and

continued...

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Section 3 - HAZARDS IDENTIFICATION

hyperkeratosis in males and females, ulcer in males, and parakeratosis and inflammation in females at the site of application and of follicular cell hyperplasia in the thyroid gland of males and females, were chemical related. Injection of EDTA and its salts can cause severe kidney damage with tissue death and internal bleeding, bone marrow depression and critically low levels of calcium.

## Section 4 - FIRST AID MEASURES

### SWALLOWED

- IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY.
- Where Medical attention is not immediately available or where the patient is more than 15 minutes from a hospital or unless instructed otherwise:
- For advice, contact a Poisons Information Center or a doctor.
- Urgent hospital treatment is likely to be needed.
- If conscious, give water to drink.
- INDUCE vomiting with fingers down the back of the throat, ONLY IF CONSCIOUS. Lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- NOTE: Wear a protective glove when inducing vomiting by mechanical means.
- In the mean time, qualified first-aid personnel should treat the patient following observation and employing supportive measures as indicated by the patient's condition.
- If the services of a medical officer or medical doctor are readily available, the patient should be placed in his/her care and a copy of the MSDS should be provided. Further action will be the responsibility of the medical specialist.
- If medical attention is not available on the worksite or surroundings send the patient to a hospital together with a copy of the MSDS.

### EYE

- If this product comes in contact with the eyes:
- Wash out immediately with fresh running water.
  - Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
  - If pain persists or recurs seek medical attention.
  - Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

### SKIN

- If skin contact occurs:
- Immediately remove all contaminated clothing, including footwear
  - Flush skin and hair with running water (and soap if available).
  - Seek medical attention in event of irritation.

### INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Lay patient down. Keep warm and rested.
- Prosthesis such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
- Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
- Transport to hospital, or doctor.

continued...

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Section 4 - FIRST AID MEASURES

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## NOTES TO PHYSICIAN

Treat symptomatically.

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## Section 5 - FIRE FIGHTING MEASURES

Flash Point (°F): Not Applicable  
Lower Explosive Limit (%): Not Applicable  
Upper Explosive Limit (%): Not Applicable  
Autoignition Temp (°F): Not Applicable

### EXTINGUISHING MEDIA

The product contains a substantial proportion of water, therefore there are no restrictions on the type of extinguishing media which may be used. Choice of extinguishing media should take into account surrounding areas. Though the material is non-combustible, evaporation of water from the mixture, caused by the heat of nearby fire, may produce floating layers of combustible substances.

In such an event consider:

- foam
- dry chemical powder
- carbon dioxide.

### FIRE FIGHTING

- Alert Emergency Responders and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves for fire only.
- Prevent, by any means available, spillage from entering drains or water course.
- Use fire fighting procedures suitable for surrounding area.
- Do not approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.
- Equipment should be thoroughly decontaminated after use.

### GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

- Non combustible.
- Not considered to be a significant fire risk.
- Expansion or decomposition on heating may lead to violent rupture of containers.
- Decomposes on heating and may produce toxic fumes of carbon monoxide (CO).
- May emit acrid smoke.

Decomposition may produce toxic fumes of, carbon dioxide (CO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), other pyrolysis products typical of burning organic material.

May emit poisonous fumes.

May emit corrosive fumes.

### FIRE INCOMPATIBILITY

None known.

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## Section 6 - ACCIDENTAL RELEASE MEASURES

### MINOR SPILLS

- Clean up all spills immediately.
- Avoid breathing vapors and contact with skin and eyes.

continued...

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## Section 6 - ACCIDENTAL RELEASE MEASURES

- Control personal contact by using protective equipment.
- Contain and absorb spill with sand, earth, inert material or vermiculite.
- Wipe up.
- Place in a suitable labeled container for waste disposal.

### MAJOR SPILLS

Moderate hazard.

- Clear area of personnel and move upwind.
- Alert Emergency Responders and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or water course.
- Stop leak if safe to do so.
- Contain spill with sand, earth or vermiculite.
- Collect recoverable product into labeled containers for recycling.
- Neutralize/decontaminate residue.
- Collect solid residues and seal in labeled drums for disposal.
- Wash area and prevent runoff into drains.
- After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.
- If contamination of drains or waterways occurs, advise emergency services.

### ACUTE EXPOSURE GUIDELINE LEVELS (AEGLE) (in ppm)

AEGLE 1: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure.

AEGLE 2: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.

AEGLE 3: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience life-threatening health effects or death.

### EMERGENCY RESPONSE PLANNING GUIDELINES (ERPG)

The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour WITHOUT experiencing or developing

life-threatening health effects is:

triethanolamine	500 mg/m <sup>3</sup>
water	500 mg/m <sup>3</sup>

irreversible or other serious effects or symptoms which could impair an individual's ability to take protective action is:

triethanolamine	20 mg/m <sup>3</sup>
water	500 mg/m <sup>3</sup>

other than mild, transient adverse effects without perceiving a clearly defined odour is:

triethanolamine	5 mg/m <sup>3</sup>
water	500 mg/m <sup>3</sup>

continued...

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## Section 6 - ACCIDENTAL RELEASE MEASURES

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The threshold concentration below which most people will experience no appreciable risk of health effects:

triethanolamine	5 mg/m <sup>3</sup>
water	500 mg/m <sup>3</sup>

American Industrial Hygiene Association (AIHA)

Ingredients considered according exceed the following cutoffs

Very Toxic (T+) >= 0.1%	Toxic (T) >= 3.0%
R50 >= 0.25%	Corrosive (C) >= 5.0%
R51 >= 2.5%	
else >= 10%	

where percentage is percentage of ingredient found in the mixture

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## Section 7 - HANDLING AND STORAGE

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### PROCEDURE FOR HANDLING

DO NOT allow clothing wet with material to stay in contact with skin.

DO NOT USE brass or copper containers / stirrers.

Alkanolamines and iron may produced unstable complexes. Monoethanolamine (MEA) and iron form a trisethanolamino-iron complex. This material may spontaneously decompose at temperatures between 130 and 160 degrees C. and is suspected of causing a fire in a nearly empty storage tank containing a "heel" of MEA in contact with carbon steel coils. If steam coil heating is used, low pressure steam in stainless steel coils should be considered. Drum heating should also be reviewed and, where possible, temperatures should be maintained below 130 degrees C.

- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- Avoid contact with moisture.
- Avoid contact with incompatible materials.
- When handling, DO NOT eat, drink or smoke.
- Keep containers securely sealed when not in use.
- Avoid physical damage to containers.
- Always wash hands with soap and water after handling.
- Work clothes should be laundered separately. Launder contaminated clothing before re-use.
- Use good occupational work practice.
- Observe manufacturer's storing and handling recommendations.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.

### RECOMMENDED STORAGE METHODS

- Polyethylene or polypropylene container.
- Packing as recommended by manufacturer
- Check all containers are clearly labeled and free from leaks.

### STORAGE REQUIREMENTS

- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry, well-ventilated area.

continued...

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Section 7 - HANDLING AND STORAGE

- Store away from incompatible materials and foodstuff containers.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storing and handling recommendations.

## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

### EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m <sup>3</sup>	STEL ppm	STEL mg/m <sup>3</sup>	Peak ppm	Peak mg/m <sup>3</sup>
US California Permissible Exposure Limits for Chemical Contaminants	Triethanolamine	--	5				
Canada Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	Triethanolamine		5		10		
Canadian British Columbia Occupational Exposure Limits	Triethanolamine		5				
No data available:	EDTA tetrasodium salt as (CAS: 64-02-8) / (CAS: 10378-23-1) / (CAS: 13235-36-4)						
No data available:	water as (CAS: 7732-18-5)						

### ODOUR SAFETY FACTOR (OSF)

OSF=0.77 (triethanolamine)

Exposed individuals are NOT reasonably expected to be warned, by smell, that the Exposure Standard is being exceeded.

Odor Safety Factor (OSF) is determined to fall into either Class C, D or E.

The Odor Safety Factor (OSF) is defined as:

OSF= Exposure Standard (TWA) ppm/ Odor Threshold Value (OTV) ppm

Classification into classes follows:

Class	OSF	Description
A	550	Over 90% of exposed individuals are aware by smell that the Exposure Standard (TLV-TWA for example) is being reached, even when distracted by working activities
B	26-550	Idem for 50-90% of persons being distracted
C	1-26	Idem for less than 50% of persons being distracted
D	0.18-1	0-50% of persons aware of being tested perceive by smell that the Exposure Standard is being reached
E	<0.18	Idem for less than 10% of persons aware of being tested

Amoore and Hautala \* have determined that it is only at an OSF value of 26 that

continued...

# GENERAL HARDNESS (GH) TEST SOLUTION

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

50% of distracted persons can detect the substance at the Exposure Standard value. In the case of alerted persons, an OSF of 26 means that 99% of them can detect the odor at the Exposure Standard value. It is ONLY for substances belonging to Class A and B that there is a reasonable chance of being warned in time, that the Exposure Standard is being exceeded. \* Journal Applied

Toxicology: Vol 3, 1983, p272

NOTE: The use of the OSF may be inappropriate for mixtures where substances mask the odor of others.

### EXPOSURE STANDARDS FOR MIXTURE

"Worst Case" computer-aided prediction of spray/ mist or fume/ dust components and concentration:

"Worst Case" computer-aided prediction of spray/ mist or fume/ dust components and concentration:

Composite Exposure Standard for Mixture (TWA) :100 mg/m<sup>3</sup>.

### INGREDIENT DATA

#### TRIETHANOLAMINE:

Exposure at or below the TLV-TWA is thought to minimise the potential for skin and eye irritation, and acute effects (including liver, kidney and nerve damage) and chronic effects (including cancer and allergic contact dermatitis).

#### EDTA TETRASODIUM SALT:

Dusts not otherwise classified, as inspirable dust;  
ES TWA: 10 mg/m<sup>3</sup>.

#### WATER:

No exposure limits set by NOHSC or ACGIH.

### PERSONAL PROTECTION

Glasses:

Chemical goggles.

Gloves:

PVC chemical resistant type.

Respirator:

Type AK-P Filter of sufficient capacity

### EYE

- Safety glasses with side shields.
- Chemical goggles.
- Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them. DO NOT wear contact lenses.

### HANDS/FEET

Wear chemical protective gloves, eg. PVC.

Wear safety footwear or safety gumboots, eg. Rubber.

NOTE: The material may produce skin sensitisation in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact.

### OTHER

- Overalls.
- P.V.C. apron.
- Barrier cream.

continued...

# GENERAL HARDNESS (GH) TEST SOLUTION

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

- Skin cleansing cream.
- Eye wash unit.

### RESPIRATOR

Selection of the Class and Type of respirator will depend upon the level of breathing zone contaminant and the chemical nature of the contaminant. Protection Factors (defined as the ratio of contaminant outside and inside the mask) may also be important.

Breathing Zone Level ppm (volume)	Maximum Protection Factor	Half-face Respirator	Full-Face Respirator
1000	10	AK-1 P	-
1000	50	-	AK-1 P
5000	50	Airline*	-
5000	100	-	AK-2 P
10000	100	-	AK-3 P
	100+		Airline* *

\* - Continuous Flow \*\* - Continuous-flow or positive pressure demand.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.

Use appropriate NIOSH-certified respirator based on informed professional judgement. In conditions where no reasonable estimate of exposure can be made, assume the exposure is in a concentration IDLH and use NIOSH-certified full face pressure demand SCBA with a minimum service life of 30 minutes, or a combination full facepiece pressure demand SAR with auxiliary self-contained air supply. Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.

### ENGINEERING CONTROLS

Local exhaust ventilation usually required. If risk of overexposure exists, wear an approved respirator. Correct fit is essential to obtain adequate protection an approved self contained breathing apparatus (SCBA) may be required in some situations. Provide adequate ventilation in warehouse or closed storage area.

## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

### PHYSICAL PROPERTIES

Liquid.  
Mixes with water.

Molecular Weight: Not Applicable  
Melting Range (°C): Not Available  
Solubility in water (g/L): Miscible  
pH (1% solution): Not Available  
Volatile Component (%vol): Not Available  
Relative Vapor Density (air=1): Not Available  
Lower Explosive Limit (%): Not Applicable  
Autoignition Temp (°C): Not Applicable  
State: Liquid

Boiling Range (°C): Not Available  
Specific Gravity (water=1): 1.056  
pH (as supplied): 10.7-11.3  
Vapor Pressure (kPa): Not Available  
Evaporation Rate: Not Available  
Flash Point (°C): Not Applicable  
Upper Explosive Limit (%): Not Applicable  
Decomposition Temp (°C): Not Available

continued...

# GENERAL HARDNESS (GH) TEST SOLUTION

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## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

### APPEARANCE

Dark green alkaline solution with a slight odor; mixes with water.

## Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

### CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerization will not occur.

### STORAGE INCOMPATIBILITY

Avoid strong acids, bases.

## Section 11 - TOXICOLOGICAL INFORMATION

### General Hardness (GH) Test Solution

Not available. Refer to individual constituents.

unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances

#### TRIETHANOLAMINE:

##### TOXICITY

Oral (rat) LD50: 8000 mg/kg  
Oral (rat) LD50: 4920 ul/kg  
Oral (rat) LD50: 5560 mg/kg (calc.)  
Oral (rat) LD50: 4.92 ml/kg (female) \*  
Oral (rat) LD50: 8.57 ml/kg (male) \*  
Dermal (rat) LD50: >16000 mg/kg  
Dermal (rabbit) LD50: 16 ml/kg \*  
Intraperitoneal (rat) LD50: 1510 mg/kg  
Oral (mouse) LD50: 5846 mg/kg  
Intraperitoneal (mouse) LD50: 1450 mg/kg  
Oral (rabbit) LD50: 2200 mg/kg  
Dermal (rabbit) LD50: >20000 mg/kg  
Oral (g.pig) LD50: 2200 mg/kg  
(occluded, male or female)  
Kill rate 1/5 \*

Lachrymation, diarrhoea, convulsions, urinary tract changes, changes in bladder weight, changes in testicular weight, changes in thymus weight, changes in liver weight, dermatitis after systemic exposure, kidney, ureter, bladder tumours recorded.

Equivocal tumourigen by RTECS criteria.

\* Union Carbide

The substance is classified by IARC as Group 3:

NOT classifiable as to its carcinogenicity to humans.

Evidence of carcinogenicity may be inadequate or limited in animal testing.

NOTE: Substance has been shown to be mutagenic in at least one assay, or belongs to a family of chemicals producing damage or change to cellular DNA.

Limited evidence of a carcinogenic effect\*.

##### IRRITATION

Skin (human): 15 mg/3d (int)-mild  
Skin (rabbit): 560 mg/24 hr- mild  
Eye (rabbit): 5.62 mg - SEVERE  
Eye (rabbit): 10 mg - mild  
Eye (rabbit): 0.1 ml -  
minor iritis,  
minor conjunctival irritation  
Skin (rabbit): 4 h occluded  
no irritation \*

with significant discharge;  
no corneal injury \*

#### EDTA TETRASODIUM SALT:

continued...

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## Section 11 - TOXICOLOGICAL INFORMATION

### TOXICITY

Oral (rat) LD50: 2000-3200 mg/kg\*  
Eyes (rabbit): 1.9 mg  
Eyes (rabbit): 100 mg/24h-Moderate  
\*[BASF]

### IRRITATION

Skin (rabbit): 500 mg/24h-Moderate

### WATER:

#### TOXICITY

No significant acute toxicological data identified in literature search.

#### IRRITATION

## Section 12 - ECOLOGICAL INFORMATION

DO NOT discharge into sewer or waterways.  
Refer to data for ingredients, which follows:

### TRIETHANOLAMINE:

Fish LC50 (96hr.) (mg/l): 3500 (24hr)  
Daphnia magna EC50 (48hr.) (mg/l): 2.5  
Algae IC50 (72hr.) (mg/l): 1.8-47  
log Kow (Sangster 1997): -1  
log Pow (Verschueren 1983): 0.75428571  
BOD20: 6.20%  
ThOD: 2.04

log Kow : -1.32- -1.75

Koc : 3

Half-life (hr) air : 4

Henry's atm m<sup>3</sup> /mol: 3.38E-19

BOD 5 if unstated: nil-0.17

COD : 1.5

ThOD : 2.04; 1.61 p/p

ThOD (measured) 1.52 mg/mg (Union Carbide)

ThOD (calculated) 1.61 mg/mg (Union Carbide)

BCF : <1

Biodegradability:

96% DOC reduction (OECD Method 301E)

BOD

Day 5: 8%

Day 10: 9%

Day 20: 66%

Passes Sturm, AFNOR tests for biodegradability.

Reaches more than 70% mineralisation in OECD test for inherent biodegradability (Zahn-Wellens test)

Theoretical oxygen demand ThOD) is calculated at 1.61 p/p. Degradation is expected in the atmospheric environment within minutes to hours.

Material is practically non-toxic to aquatic organisms on an acute basis (LC50 >100 mg/l in most sensitive species)

Fish LC50 (96 h): fathead minnow (*Pimephales promelas*) 1800-11800 mg/l

fathead minnow 5600 mg/l (Union Carbide)

bluegill (*Leuciscus idus*) 7930 mg/l

goldfish (*Carrassius auratus*) 5000 mg/l

Daphnia magna LC50 (24 h): 1390 - 2038 mg/l

Daphnia magna LC50 (48 h): 947 mg/l (Union Carbide)

Algae LC50 (48 h): 750 mg/l

Brine shrimp LC50: (*Artemia salina*) 5600 mg/l

continued...

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Section 12 - ECOLOGICAL INFORMATION

Maximum acceptable toxicant concentration (MATC): 22 mg/l  
Algal growth inhibition (*Scenedesmus subspicatus*) EC50: 470-750 mg/l  
Inhibition of bacteria in effluent: 50% inhibition: >10000 mg/l  
Inhibitory concentration (IC50) is OECD "Activated Sludge, Respiration Inhibition Test" (Guideline 209) is >1000 mg/l. Material has shown a potential to biodegrade. Attains >99% degradation in activated sludge in 24 hours. Attains >99% degradation in soil is 1-14 days.  
Bioconcentration potential is low (BCF less than 100 or log Kow less than 3). Log octanol/ water partition coefficient (log Kow) is estimated using the Pomona-Medchem structural fragment to be -1.746. Potential for the mobility in soil is very high (Koc between 0 and 50).  
Henry's Law Constant (H) is estimated to be 3.38E-19 atm.m<sup>3</sup>/mol (25 C)  
Log soil organic carbon partition coefficient (log Koc) is estimated to be 0.48.  
When released into soil the material is expected to degrade without significant evaporation. A half-life of between 1 to 10 days is expected. When released into water, the material is expected to degrade with a half-life of about 1 to 10 days. Because the material has a log octanol-water coefficient of less than 3 it is not expected to bioaccumulate. Release to air is expected to produce photolytic degradation resulting in hydroxyl radicals. The material is expected to be removed from the atmosphere by dry and wet deposition (half-life between 1 and 10 days).

## EDTA TETRASODIUM SALT:

Not readily biodegradable. Harmful to aquatic organisms.  
May cause long term adverse effects in the aquatic environment.  
Toxicity to fish: LC50 (96h): >500 mg/l (*Leuciscus idus*)  
Toxicity to daphnae (acute): EC50 (48h): >100 mg/l  
Toxicity to algae EC50 (72h): 10-100 mg/l  
COD Value: 570 mg O<sub>2</sub>/g  
BOD5-Value: 20 mg O<sub>2</sub>/g  
Toxicity to bacteria: 50 mg/l Warburg test

[ORICA]

## Section 13 - DISPOSAL CONSIDERATIONS

### Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.

- Recycle wherever possible.
- Consult manufacturer for recycling options or consult Waste Management Authority for disposal if no suitable treatment or disposal facility can be identified.
- Dispose of by: Burial in a licensed land-fill or Incineration in a licensed apparatus (after admixture with suitable combustible material)
- Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.

Puncture containers to prevent re-use and bury at an authorized landfill.

continued...

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## Section 14 - TRANSPORTATION INFORMATION

DOT Information  
Shipping Name: None  
Hazard Class: None  
SubRisk: None  
UN/NA Number: None  
Packing Group: None  
Additional Shipping Information:  
International Transport Regulations:  
IMO: None

## Section 15 - REGULATORY INFORMATION



### RISK

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

### US Federal Regulations

#### A. General Product Information

In addition to Federal and State regulation, local regulations may apply. Check with your local regulatory authorities.

#### B. Component Information

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 455 Appendix A)

SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4): None

-----  
Component                      TSCA  
triethanolamine                Y  
EDTA tetrasodium salt        Y

### State Regulations

#### A. General Product Information

#### B. Component Information

The following components appear on one or more of the following state hazardous substance lists.

Component	CAS No	CA	FL	MA	MN	NJ	PA
triethanolamine	102-71-6	N	Y	Y	Y	N	Y
EDTA tetrasodium salt	64-02-8	N	N	N	N	N	N

Y=Yes this material appears on that state's hazardous substances list.

N=No this material does not appear on that state's hazardous substances list.

continued...

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Section 15 - REGULATORY INFORMATION

## Other Regulations

### A. General Product Information

All components are listed in the European Inventory of New and Existing Chemical Substances (EINECS)

### B. Component Information

#### CANADA

The following component(s) are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS No	%	Min Conc.
triethanolamine	102-71-6	10-30	1% item 1621 (1663)

All of this product's components are on the Canadian Domestic

## REGULATIONS

triethanolamine (CAS: 102-71-6) is found on the following regulatory lists

Canadian Domestic Substances List (DSL)

US Toxic Substances Control Act (TSCA)

US TSCA Section 8 (d) - Health and Safety Data Reporting

US EPA Other (Inert) Pesticide Ingredients in Pesticide Products, List 2:

Potentially Toxic Other Ingredients/High Priority for Testing inerts

US Minnesota Hazardous Substance List

US EPA High Production Volume Program Chemical List

Canadian Ingredient Disclosure List (SOR/88-64)

US DOE Temporary Emergency Exposure Limits (TEELs)

US Food Additive Database

Canada Saskatchewan Occupational Health and Safety Regulations - Contamination Limits

US California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELs) - Respiratory

EDTA tetrasodium salt (CAS: 64-02-8) is found on the following regulatory lists

Canadian Domestic Substances List (DSL)

US Toxic Substances Control Act (TSCA)

US EPA High Production Volume Program Chemical List

US DOE Temporary Emergency Exposure Limits (TEELs)

US Food Additive Database

US California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELs) - Respiratory

EDTA tetrasodium salt (CAS: 10378-23-1) is found on the following regulatory lists

US DOE Temporary Emergency Exposure Limits (TEELs)

US California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELs) - Respiratory

water (CAS: 7732-18-5) is found on the following regulatory lists

Canadian Domestic Substances List (DSL)

US Toxic Substances Control Act (TSCA)

US DOE Temporary Emergency Exposure Limits (TEELs)

US Californian Proposition 65 - Priority List for the Development of MADLs for Chemicals Causing Reproductive Toxicity

No data available for EDTA tetrasodium salt as CAS: 13235-36-4.

continued...

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## Section 16 - OTHER INFORMATION

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# CARBONATE HARDNESS (KH) TEST SOLUTION

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## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

---

### PRODUCT NAME

CARBONATE HARDNESS (KH) TEST SOLUTION

### STATEMENT OF HAZARDOUS NATURE

Not considered a hazardous substance according to OSHA 29  
CFR 1910.1200.

### SUPPLIER

Company: Aquarium Pharmaceuticals Incorporated  
Address:  
50 East Hamilton Street  
Chalfont  
PA, 18914  
USA  
Telephone: +1 215 822 8181

Company: Aquarium Pharmaceuticals Incorporated  
Address:  
PO Box 218  
Chalfont  
PA, 18914-0218  
USA  
Telephone: +1 215 822 8181  
Emergency Tel: +1800 222 1222 (US Only)

### PRODUCT USE

Test solution for products 34P, 58 and 59.

### SYNONYMS

"Solution ID# 3339"

---

## Section 2 - COMPOSITION / INFORMATION ON INGREDIENTS

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NAME	CAS RN	%
non hazardous ingredients		100

---

## Section 3 - HAZARDS IDENTIFICATION

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### CANADIAN WHMIS SYMBOLS

None

### EMERGENCY OVERVIEW

#### RISK

### POTENTIAL HEALTH EFFECTS

#### ACUTE HEALTH EFFECTS

#### SWALLOWED

The material has NOT been classified as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence. The material may still be damaging to the health of the individual, following ingestion, especially where pre-existing organ (e.g. liver, kidney) damage is evident. Present definitions of harmful or toxic substances are generally based on doses producing mortality

continued...

# CARBONATE HARDNESS (KH) TEST SOLUTION

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Section 3 - HAZARDS IDENTIFICATION

(death) rather than those producing morbidity (disease, ill-health).  
Gastrointestinal tract discomfort may produce nausea and vomiting. In an occupational setting however, unintentional ingestion is not thought to be cause for concern.

## EYE

Although the liquid is not thought to be an irritant, direct contact with the eye may produce transient discomfort characterized by tearing or conjunctival redness (as with windburn).

## SKIN

The material is not thought to produce adverse health effects or skin irritation following contact (as classified using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.

## INHALED

The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.

## CHRONIC HEALTH EFFECTS

Long-term exposure to the product is not thought to produce chronic effects adverse to the health (as classified using animal models); nevertheless exposure by all routes should be minimized as a matter of course.

---

## Section 4 - FIRST AID MEASURES

---

### SWALLOWED

- Immediately give a glass of water.
- First aid is not generally required. If in doubt, contact a Poisons Information Center or a doctor.

### EYE

- If this product comes in contact with eyes:
- Wash out immediately with water.
  - If irritation continues, seek medical attention.
  - Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

### SKIN

- If skin or hair contact occurs:
- Flush skin and hair with running water (and soap if available).
  - Seek medical attention in event of irritation.

### INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Other measures are usually unnecessary.

### NOTES TO PHYSICIAN

Treat symptomatically.

continued...

# CARBONATE HARDNESS (KH) TEST SOLUTION

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## Section 5 - FIRE FIGHTING MEASURES

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Flash Point (°F): Not Applicable  
Lower Explosive Limit (%): Not Applicable  
Upper Explosive Limit (%): Not Applicable  
Autoignition Temp (°F): Not Applicable

### EXTINGUISHING MEDIA

- There is no restriction on the type of extinguisher which may be used.  
Use extinguishing media suitable for surrounding area.

### FIRE FIGHTING

- Use water delivered as a fine spray to control fire and cool adjacent area.
- DO NOT approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.
- Equipment should be thoroughly decontaminated after use.

### GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

- Non combustible.
- Not considered to be a significant fire risk.
- Expansion or decomposition on heating may lead to violent rupture of containers.
- Decomposes on heating and may produce toxic/ irritating fumes.
- May emit acrid smoke.

### FIRE INCOMPATIBILITY

None known.

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## Section 6 - ACCIDENTAL RELEASE MEASURES

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### MINOR SPILLS

- Clean up all spills immediately.
- Avoid breathing vapors and contact with skin and eyes.
- Control personal contact by using protective equipment.
- Contain and absorb spill with sand, earth, inert material or vermiculite.
- Wipe up.
- Place in a suitable labeled container for waste disposal.

### MAJOR SPILLS

- Clear area of personnel and move upwind.
- Alert Emergency Responders and tell them location and nature of hazard.
- Control personal contact by using protective equipment.
- Prevent spillage from entering drains, sewers or water courses.
- Recover product wherever possible.
- Put residues in labeled containers for disposal.
- If contamination of drains or waterways occurs, advise emergency services.

## ACUTE EXPOSURE GUIDELINE LEVELS (AEGL) (in ppm)

AEGL 1: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could

continued...

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## Section 6 - ACCIDENTAL RELEASE MEASURES

---

experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure.

AEGL 2: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.

AEGL 3: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience life-threatening health effects or death.

---

## Section 7 - HANDLING AND STORAGE

---

### PROCEDURE FOR HANDLING

- Limit all unnecessary personal contact.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- When handling DO NOT eat, drink or smoke.
- Always wash hands with soap and water after handling.
- Avoid physical damage to containers.
- Use good occupational work practice.
- Observe manufacturer's storing and handling recommendations.

### RECOMMENDED STORAGE METHODS

- Polyethylene or polypropylene container.
- Packing as recommended by manufacturer
- Check all containers are clearly labeled and free from leaks.

### STORAGE REQUIREMENTS

- Store in original containers.
  - Keep containers securely sealed.
  - Store in a cool, dry, well-ventilated area.
  - Store away from incompatible materials and foodstuff containers.
  - Protect containers against physical damage and check regularly for leaks.
  - Observe manufacturer's storing and handling recommendations.
- Segregate from alkalis, oxidizing agents and chemicals readily decomposed by acids, i.e. cyanides, sulfides, carbonates.

---

## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

---

### EXPOSURE CONTROLS

Not available. Refer to individual constituents.

### PERSONAL PROTECTION

Glasses:

Chemical goggles.

Gloves:

When handling larger quantities:

General purpose rubber glove.

Respirator:

continued...

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

---

### EYE

- Safety glasses with side shields; or as required,
- Chemical goggles.
- Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them.

### HANDS/FEET

Wear general protective gloves, e.g.. light weight rubber gloves.

### OTHER

No special equipment needed when handling small quantities.

#### OTHERWISE:

- Overalls.
- Barrier cream.
- Eyewash unit.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.

Use appropriate NIOSH-certified respirator based on informed professional judgement. In conditions where no reasonable estimate of exposure can be made, assume the exposure is in a concentration IDLH and use NIOSH-certified full face pressure demand SCBA with a minimum service life of 30 minutes, or a combination full facepiece pressure demand SAR with auxiliary self-contained air supply. Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.

## ENGINEERING CONTROLS

General exhaust is adequate under normal operating conditions. If risk of overexposure exists, wear an approved respirator. Correct fit is essential to obtain adequate protection. Provide adequate ventilation in warehouse or closed storage areas.

---

## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

---

### PHYSICAL PROPERTIES

Liquid.  
Mixes with water.

Molecular Weight: Not Applicable  
Melting Range (°C): Not Available  
Solubility in water (g/L): Miscible  
pH (1% solution): Not Available  
Volatile Component (%vol): Not Available  
Relative Vapor Density (air=1): Not Available  
Lower Explosive Limit (%): Not Applicable  
Autoignition Temp (°C): Not Applicable  
State: Liquid

Boiling Range (°C): Not Available  
Specific Gravity (water=1): 0.997 approx.  
pH (as supplied): 1.20-1.45  
Vapor Pressure (kPa): Not Available  
Evaporation Rate: Not Available  
Flash Point (°C): Not Applicable  
Upper Explosive Limit (%): Not Applicable  
Decomposition Temp (°C): Not Available

### APPEARANCE

Reddish orange solution with no odor; mixes with water.

continued...

# CARBONATE HARDNESS (KH) TEST SOLUTION

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## Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

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### CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerization will not occur.

### STORAGE INCOMPATIBILITY

Avoid contamination of water, foodstuffs, feed or seed.  
Avoid storage with highly alkaline solutions.

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## Section 11 - TOXICOLOGICAL INFORMATION

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### Carbonate Hardness (KH) Test Solution

Not available. Refer to individual constituents.  
unless otherwise specified data extracted from RTECS - Register of Toxic Effects  
of Chemical Substances

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## Section 12 - ECOLOGICAL INFORMATION

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## Section 13 - DISPOSAL CONSIDERATIONS

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### Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.

- Recycle wherever possible.
- Consult manufacturer for recycling options or consult Waste Management Authority for disposal if no suitable treatment or disposal facility can be identified.
- Dispose of by: Burial in a licensed land-fill or Incineration in a licensed apparatus (after admixture with suitable combustible material)
- Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.

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## Section 14 - TRANSPORTATION INFORMATION

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DOT Information  
Shipping Name: None  
Hazard Class: None  
SubRisk: None  
UN/NA Number: None  
Packing Group: None  
Additional Shipping Information:  
International Transport Regulations:  
IMO: None

continued...

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## Section 15 - REGULATORY INFORMATION

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### RISK

#### US Federal Regulations

##### A. General Product Information

In addition to Federal and State regulation, local regulations may apply. Check with your local regulatory authorities.

##### B. Component Information

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 455 Appendix A)

SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4): None

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Component TSCA

#### State Regulations

##### A. General Product Information

##### B. Component Information

The following components appear on one or more of the following state hazardous substance lists.

Component CAS No CA FL MA MN NJ PA

Y=Yes this material appears on that state's hazardous substances list.

N=No this material does not appear on that state's hazardous substances list.

#### Other Regulations

##### A. General Product Information

All components are listed in the European Inventory of New and Existing Chemical Substances (EINECS)

##### B. Component Information

CANADA

All of this product's components are on the Canadian Domestic

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## Section 16 - OTHER INFORMATION

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