

# Hydroxylamine hydrochloride

sc-211616



The Power is Question

Material Safety Data Sheet

Hazard Alert Code Key: **EXTREME** **HIGH** **MODERATE** **LOW**

## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

### PRODUCT NAME

Hydroxylamine hydrochloride

### STATEMENT OF HAZARDOUS NATURE

CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

### NFPA



### SUPPLIER

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

### EMERGENCY:

ChemWatch  
Within the US & Canada: 877-715-9305  
Outside the US & Canada: +800 2436 2255  
(1-800-CHEMCALL) or call +613 9573 3112

### SYNONYMS

N-H4-Cl-O, NH<sub>2</sub>OH.HCl, "hydroxylamine hydrochloride", "hydroxyammonium chloride", "hydroxylamine chloride", "hydroxylamine chloride (1:1)", "oxammonium hydrochloride"

## Section 2 - HAZARDS IDENTIFICATION

### CHEMWATCH HAZARD RATINGS

	Min	Max
Flammability:	1	
Toxicity:	2	
Body Contact:	3	
Reactivity:	3	
Chronic:	2	

Min/Nil=0  
Low=1  
Moderate=2  
High=3  
Extreme=4



### CANADIAN WHMIS SYMBOLS



## EMERGENCY OVERVIEW

### RISK

Risk of explosion by shock, friction, fire or other sources of ignition.  
May cause SENSITISATION by skin contact.  
Limited evidence of a carcinogenic effect.  
Harmful: danger of serious damage to health by prolonged exposure if swallowed.  
Harmful in contact with skin and if swallowed.  
Irritating to eyes and skin.  
Very toxic to aquatic organisms.

## 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.
  - The material can produce chemical burns within the oral cavity and gastrointestinal tract following ingestion.
  - The substance and/or its metabolites may bind to hemoglobin inhibiting normal uptake of oxygen. This condition, known as "methemoglobinemia", is a form of oxygen starvation (anoxia).
  - Ingestion of acidic corrosives may produce burns around and in the mouth, the throat and esophagus.
- <|p>
- Large doses of ammonia or injected ammonium salts may produce diarrhea and may be sufficiently absorbed to produce increased production of urine and systemic poisoning. Symptoms include weakening of facial muscle, tremor, anxiety, reduced muscle and limb control.
  - Hydroxylamine relaxes the smooth muscle of blood vessels, causing low blood pressure, increased heart rate, circulatory insufficiency and cardiovascular collapse. Large doses produce destruction of blood cells.

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#### EYE

- This material can cause eye irritation and damage in some persons.
- The material can produce chemical burns to the eye following direct contact. Vapors or mists may be extremely irritating.
- 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.

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#### SKIN

- This material can cause inflammation of the skin on contact in some persons.
- Skin contact with the material may be harmful; systemic effects may result following absorption.
- The material can produce chemical burns following direct contact with the skin.
- Open cuts, abraded or irritated skin should not be exposed to this material.
- 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.
- Mild irritation is produced on moist skin when vapour concentrations of ammonia exceed 10000 ppm. High vapour concentrations (>30000 ppm) or direct contact with solutions produces severe pain, a stinging sensation, burns and vesiculation and possible brown stains. Extensive burning may be fatal. Vapour exposure may, rarely, produce urticaria.

#### INHALED

- Inhalation of dusts, generated by the material during the course of normal handling, may be damaging to the health of the individual.
- Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.
- Corrosive acids can cause irritation of the respiratory tract, with coughing, choking and mucous membrane damage. There may be dizziness, headache, nausea and weakness.

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- The highly irritant properties of ammonia vapor result as the gas dissolves in mucous fluids and forms irritant, even corrosive solutions.
- Limited evidence exists that the substance may cause irreversible but non-lethal mutagenic effects following a single exposure.

## CHRONIC HEALTH EFFECTS

- Harmful: danger of serious damage to health by prolonged exposure if swallowed.  
This material can cause serious damage if one is exposed to it for long periods. It can be assumed that it contains a substance which can produce severe defects.

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

There is some evidence that inhaling this product is more likely to cause a sensitization reaction in some persons compared to the general population.

Exposure to the material may result in a possible risk of irreversible effects. The material may produce mutagenic effects in man. This concern is raised, generally, on the basis of

appropriate studies with similar materials using mammalian somatic cells in vivo. Such findings are often supported by positive results from in vitro mutagenicity studies.

Repeated exposure to hydroxylamine and derivatives may result in respiratory sensitization with asthma-like symptoms.

Long term exposure to high dust concentrations may cause changes in lung function i.e. pneumoconiosis; caused by particles less than 0.5 micron penetrating and remaining in the lung.

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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.

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Prolonged or repeated minor exposure to ammonia gas/vapour may cause long-term irritation to the eyes, nose and upper respiratory tract.

Repeated exposure or prolonged contact may produce dermatitis, and conjunctivitis.

Other effects may include ulcerative changes to the mouth and bronchial and gastrointestinal disturbances. Adaptation to usually irritating concentrations may result in tolerance. In animals, repeated exposures to sub-lethal levels produces adverse effects on the respiratory tract, liver, kidneys and spleen. Exposure at 675 ppm for several weeks produced eye irritation in dogs and rabbits; corneal opacity, covering between a quarter to one half of the total surface area, was evident in rabbits.

### Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
hydroxylamine hydrochloride	5470-11-1	> 99
hydrolyses to		
<a href="#">ammonia</a>	1336-21-6	

### Section 4 - FIRST AID MEASURES

#### SWALLOWED

· For advice, contact a Poisons Information Center or a doctor at once. · Urgent hospital treatment is likely to be needed.

#### 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.

#### 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.

#### INHALED

· If fumes or combustion products are inhaled remove from contaminated area. · Lay patient down. Keep warm and rested. Inhalation of vapors or aerosols (mists, fumes) may cause lung edema. Corrosive substances may cause lung damage (e.g. <p>

#### NOTES TO PHYSICIAN

■ Treat symptomatically.

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.

The material may induce methemoglobinemia following exposure.

· Initial attention should be directed at oxygen delivery and assisted ventilation if necessary. Hyperbaric oxygen has not demonstrated substantial benefits.

· Hypotension should respond to Trendelenburg's position and intravenous fluids; otherwise dopamine may be needed.

### Section 5 - FIRE FIGHTING MEASURES

Vapour Pressure (mmHG): Not applicable

Upper Explosive Limit (%): Not applicable

Specific Gravity (water=1): 1.67

Lower Explosive Limit (%): Not applicable

#### EXTINGUISHING MEDIA

· Water spray or fog.

· Foam.

#### FIRE FIGHTING

· Alert Emergency Responders and tell them location and nature of hazard.

· Wear full body protective clothing with breathing apparatus.

When any large container (including road and rail tankers) is involved in a fire, consider evacuation by 800 metres in all directions.

#### GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

■ WARNING: May EXPLODE on heating!!!

- Non combustible.
  - Not considered to be a significant fire risk.
- WARNING: If heated above 115 deg C may explode

**FIRE INCOMPATIBILITY**

- None known.

**PERSONAL PROTECTION**

- Glasses:  
 Safety Glasses.  
 Full face- shield.  
 Gloves:  
 Respirator:  
 Type K Filter of sufficient capacity

**Section 6 - ACCIDENTAL RELEASE MEASURES**

**MINOR SPILLS**

- Clean up waste regularly and abnormal spills immediately.
- Avoid breathing dust and contact with skin and eyes.
- Wear protective clothing, gloves, safety glasses and dust respirator.
- Use dry clean up procedures and avoid generating dust.
- Vacuum up or sweep up. NOTE: Vacuum cleaner must be fitted with an exhaust micro filter (HEPA type) (consider explosion-proof machines designed to be grounded during storage and use).
- Dampen with water to prevent dusting before sweeping.
- Place in suitable containers for disposal.
- Drains for storage or use areas should have retention basins for pH adjustments and dilution of spills before discharge or disposal of material.
- Check regularly for spills and leaks.

**MAJOR SPILLS**

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

**Section 7 - HANDLING AND STORAGE**

**PROCEDURE FOR HANDLING**

- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.

**RECOMMENDED STORAGE METHODS**

- DO NOT use aluminum or galvanized containers.

Check regularly for spills and leaks.

Glass container.

- Lined metal can, Lined metal pail/drum
- Plastic pail.

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.

**STORAGE REQUIREMENTS**

- Store in original containers.
- Keep containers securely sealed.

**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	Notes
US - California Permissible Exposure Limits for Chemical Contaminants	hydroxylamine hydrochloride (Particulates not otherwise regulated Respirable fraction)		5						(n)

US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	hydroxylamine hydrochloride (Particulates not otherwise regulated Respirable fraction)		5			
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants	hydroxylamine hydrochloride (Particulates not otherwise regulated (PNOR)(f)-Respirable fraction)		5			
US - Michigan Exposure Limits for Air Contaminants	hydroxylamine hydrochloride (Particulates not otherwise regulated, Respirable dust)		5			
Canada - Prince Edward Island Occupational Exposure Limits	hydroxylamine hydrochloride (Particles (Insoluble or Poorly Soluble) [NOS] Inhalable particles)		10			See Appendix B current TLV/BEI Book
Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances	ammonia (Ammonia)	25	18	40	30	
US - Minnesota Permissible Exposure Limits (PELs)	ammonia (Ammonia)			35	27	
US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)	ammonia (AMMONIA)	1.7				
US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)	ammonia (AMMONIA)	0.1				
US NIOSH Recommended Exposure Limits (RELs)	ammonia (Ammonia)	25	18	35	27	
Canada - Alberta Occupational Exposure Limits	ammonia (Ammonia)	25	17	35	24	
Canada - British Columbia Occupational Exposure Limits	ammonia (Ammonia)	25		35		
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	ammonia (Ammonia)			35	27	

US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants	ammonia (Ammonia)	50	35			
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	ammonia (Ammonia)			35	27	
US - California Permissible Exposure Limits for Chemical Contaminants	ammonia (Ammonia)	25	18	35	27	
US - Idaho - Limits for Air Contaminants	ammonia (Ammonia)	50	35			
US ACGIH Threshold Limit Values (TLV)	ammonia (Ammonia)	25		35		TLV Basis: eye damage; upper respiratory tract irritation
US - Alaska Limits for Air Contaminants	ammonia (Ammonia)			35	27	
US - Michigan Exposure Limits for Air Contaminants	ammonia (Ammonia)			35	27	
US - Oregon Permissible Exposure Limits (Z-1)	ammonia (Ammonia)	25	18			*
US - Washington Permissible exposure limits of air contaminants	ammonia (Ammonia)	25		35		
Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	ammonia (Ammonia)	25		35		
US - Hawaii Air Contaminant Limits	ammonia (Ammonia)	25	18	35	27	
Canada - Northwest Territories Occupational Exposure Limits (English)	ammonia (Ammonia)	25	17	35	24	
Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)	ammonia (Ammonia)	25	17	35	24	
US OSHA Permissible Exposure Levels (PELs) - Table Z1	ammonia (Ammonia)	50	35			

Canada - Nova Scotia Occupational Exposure Limits	ammonia (Ammonia)	25	35	TLV Basis: eye damage; upper respiratory tract irritation
Canada - Prince Edward Island Occupational Exposure Limits	ammonia (Ammonia)	25	35	TLV Basis: eye damage; upper respiratory tract irritation
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants ENDOELTABLE	ammonia (Ammonia)	50	35	

### PERSONAL PROTECTION



#### RESPIRATOR

Type K Filter of sufficient capacity  
Consult your EHS staff for recommendations

#### EYE

- Chemical goggles.
- Full face shield.

#### HANDS/FEET

■ Wear chemical protective gloves, eg. PVC.

NOTE: The material may produce skin sensitization 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. Important factors in the selection of gloves include: such as:

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

Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739).

· When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374) is recommended.

· When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374) is recommended.

· Contaminated gloves should be replaced.

Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.

#### OTHER

- Overalls.
- PVC Apron.

#### ENGINEERING CONTROLS

■ Local exhaust ventilation usually required. If risk of overexposure exists, wear an approved respirator.

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CARE: Explosive vapour air mixtures may be present on opening vessels which have contained liquid ammonia. Fatalities have occurred.

## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

### PHYSICAL PROPERTIES

Corrosive.

Acid.

State	DIVIDED SOLID	Molecular Weight	69.50
Melting Range (°F)	303.8 Decomposes.	Viscosity	Not Applicable
Boiling Range (°F)	Decomposes.	Solubility in water (g/L)	Reacts

Flash Point (°F)	Not applicable	pH (1% solution)	3.4
Decomposition Temp (°F)	305.6	pH (as supplied)	Not applicable
Autoignition Temp (°F)	Not available	Vapour Pressure (mmHG)	Not applicable
Upper Explosive Limit (%)	Not applicable	Specific Gravity (water=1)	1.67
Lower Explosive Limit (%)	Not applicable	Relative Vapor Density (air=1)	Not applicable
Volatile Component (%vol)	Not applicable	Evaporation Rate	Not applicable

## APPEARANCE

Colourless, hygroscopic crystals. Soluble in water (560 g/l. 20 C), glycerol and alcohol. Insoluble in ether. Slowly decomposes when moist.

## Section 10 - CHEMICAL STABILITY

### CONDITIONS CONTRIBUTING TO INSTABILITY

- Contact with alkaline material liberates heat.

### STORAGE INCOMPATIBILITY

■ Hydroxylamine salts derived from strong acids are more stable than the free base, nevertheless they do decompose near their melting point or above 200 deg.C., often violently, even when unconfined. -  $4\text{NONH}_3(+)$  ->  $3\text{N}_2\text{O} + 2\text{NH}_4(+)$  +  $3\text{H}_2\text{O} + 2\text{H}^+$  - A large number of reactions of hydroxylammonium (hydroxylamine) involve oxidation-reduction processes.

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- Inorganic acids are generally soluble in water with the release of hydrogen ions. The resulting solutions have pH's of less than 7.0.

- Inorganic acids neutralize chemical bases (for example: amines and inorganic hydroxides) to form salts.

For ammonia:

- Ammonia forms explosive mixtures with oxygen, chlorine, bromine, fluorine, iodine, mercury, platinum and silver.
- Fire and/or explosion may follow contact with acetaldehyde, acrolein, aldehydes, alkylene oxides, amides, antimony, boron, boron halides, bromine chloride, chloric acid, chlorine monoxide, o-chloronitrobenzene, 1-chloro-2,4-nitrobenzene, chlorosilane, chloromelamine, chromium trioxide, chromyl chloride, epichlorohydrin, hexachloromelamine, hypochlorites (do NOT mix ammonia with liquid household bleach), isocyanates, nitrogen tetraoxide, nitrogen trichloride, nitril chloride, organic anhydrides, phosphorous trioxide, potassium ferricyanide, potassium mercuric cyanide, silver chloride, stibine, tellurium halides, tellurium hypopentachloride, tetramethylammonium amide, trimethylammonium amide, trioxxygen difluoride, vinyl acetate.
- Shock-, temperature-, and pressure sensitive compounds are formed with antimony, chlorine, germanium compounds, halogens, heavy metals, hydrocarbons, mercury oxide, silver compounds (azides, chlorides, nitrates, oxides).
- Vapours or solutions of ammonia are corrosive to copper, copper alloys, galvanised metal and aluminium. Mixtures of ammonia and air lying within the explosive limits can occur above aqueous solutions of varying strengths.
- Avoid contact with sodium hydroxide, iron and cadmium.
- Several incidents involving sudden "boiling" (occasionally violent) of a concentrated solution (d, 0.880, 35 wt %) have occurred when screw-capped winchesters are opened. These are attributable to supersaturation of the solution with gas caused by increases in temperature subsequent to preparation and bottling. The effect is particularly marked with winchesters filled in winter and opened in summer.
- Ammonia polymerises violently with ethylene oxide.
- Ammonia attacks some coatings, plastics and rubber.
- Attacks copper, bronze, brass, aluminium, steel and their alloys.

Segregate from alcohol, water.

Avoid strong acids.

- NOTE: May develop pressure in containers; open carefully. Vent periodically.

Avoid storage with copper, zinc, iron powders, copper salts and nitrates.

Reacts vigorously with oxidisers.

May generate sufficient heat to ignite combustible material. On heating exothermic decomposition may be initiated. Heavy metal impurities may reduce the decomposition temperature.

Alkalis liberate hydroxylamine which is toxic and may decompose violently.

For incompatible materials - refer to Section 7 - Handling and Storage.

## Section 11 - TOXICOLOGICAL INFORMATION

HYDROXYLAMINE HYDROCHLORIDE

### TOXICITY AND IRRITATION

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

■ Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production.

HYDROXYLAMINE HYDROCHLORIDE:



**TOXICITY      IRRITATION**

Oral (mouse) LD50: 408 mg/kg Nil Reported

■ Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's edema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type.

Allergic reactions involving the respiratory tract are usually due to interactions between IgE antibodies and allergens and occur rapidly. Allergic potential of the allergen and period of exposure often determine the severity of symptoms.

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 produce respiratory tract irritation, and result in damage to the lung including reduced lung function.

The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.

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.

Human leucocyte cell mutagen in vivo

**TOXICITY**

**IRRITATION**

**AMMONIA:**

Oral (rat) LD50: 350 mg/kg

Eye (rabbit): 0.25 mg SEVERE

Oral (human) LDLo: 43 mg/kg

Eye (rabbit): 1 mg/30s SEVERE

Inhalation (human) LCLo: 5000 ppm/5m

Inhalation (human) TCLo: 20 ppm

Inhalation (rat) LC50: 2000 ppm/4h

Unreported (man) LDLo: 132 mg/kg

Oral (Human) LD: 43 mg/kg

Inhalation (Human) LC: 5000 ppm/4h

Inhalation (Human) TCLo: 408 ppm/4h

Subcutaneous (Mouse) LD: 160 mg/kg

Intravenous (Mouse) LD50: 91 mg/kg

Oral (Cat) LD: 750 mg/kg

Subcutaneous (Rabbit) LD: 200 mg/kg

Intravenous (Rabbit) LD: 10 mg/kg

■ The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

**Section 12 - ECOLOGICAL INFORMATION**

Very toxic to aquatic organisms.

This material and its container must be disposed of as hazardous waste.

Avoid release to the environment.

Refer to special instructions/ safety data sheets.

**Ecotoxicity**

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
hydroxylamine hydrochloride	LOW		LOW	HIGH
ammonia	LOW		LOW	HIGH

**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.

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

DO NOT allow wash water from cleaning equipment to enter drains. Collect all wash water for treatment before disposal.

- 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.

## Section 14 - TRANSPORTATION INFORMATION



DOT:

Symbols: None Hazard class or Division: 8

Identification Numbers: UN2923 PG: III

Label Codes: 8, 6.1 Special provisions: IB8, IP3, T1, TP33

Packaging: Exceptions: 154 Packaging: Non- bulk: 213

Packaging: Exceptions: 154 Quantity limitations: 25 kg

Passenger aircraft/rail:

Quantity Limitations: Cargo 100 kg Vessel stowage: Location: B aircraft only:

Vessel stowage: Other: 40, 95

Hazardous materials descriptions and proper shipping names:

Corrosive solids, toxic, n.o.s.

### Air Transport IATA:

ICAO/IATA Class: 8 ICAO/IATA Subrisk: 6.1

UN/ID Number: 2923 Packing Group: III

Special provisions: A3

Cargo Only

Packing Instructions: 823 Maximum Qty/Pack: 100 kg

Passenger and Cargo Passenger and Cargo

Packing Instructions: 822 Maximum Qty/Pack: 25 kg

Passenger and Cargo Limited Quantity Passenger and Cargo Limited Quantity

Packing Instructions: Y822 Maximum Qty/Pack: 5 kg

Shipping Name: CORROSIVE SOLID, TOXIC, N.O.S. \*(CONTAINS HYDROXYLAMINE HYDROCHLORIDE)

### Maritime Transport IMDG:

IMDG Class: 8 IMDG Subrisk: 6.1

UN Number: 2923 Packing Group: III

EMS Number: F-A , S-B Special provisions: 223 274

Limited Quantities: 5 kg Marine Pollutant: Yes

Shipping Name: CORROSIVE SOLID, TOXIC, N.O.S.

## Section 15 - REGULATORY INFORMATION

**hydroxylamine hydrochloride (CAS: 5470-11-1) is found on the following regulatory lists;**

"Canada Domestic Substances List (DSL)", "US DOE Temporary Emergency Exposure Limits (TEELs)", "US Toxic Substances Control Act (TSCA) - Inventory"

### Regulations for ingredients

**ammonia (CAS: 1336-21-6) is found on the following regulatory lists;**

"Canada - Saskatchewan Industrial Hazardous Substances", "Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances", "Canada Domestic Substances List (DSL)", "Canada Environmental Protection Act (CEPA) 1999 - Schedule 1 Toxic Substances List", "Canada Environmental Quality Guidelines (EQGs) Water: Aquatic life", "Canada Ingredient Disclosure List (SOR/88-64)", "Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (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 Council of Chemical Associations (ICCA) - High Production Volume List", "International Fragrance Association (IFRA) Survey: Transparency List", "OECD Representative List of High Production Volume (HPV) Chemicals", "US - California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List", "US - Massachusetts Oil & Hazardous Material List", "US - New Jersey Right to Know Hazardous Substances", "US - Pennsylvania -

Hazardous Substance List", "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 Department of Transportation (DOT), Hazardous Material Table", "US DOE Temporary Emergency Exposure Limits (TEELs)", "US EPA High Production Volume Chemicals Additional List", "US Food Additive Database", "US List of Lists - Consolidated List of Chemicals Subject to EPCRA, CERCLA and Section 112(r) of the Clean Air Act", "US NFPA 45 Fire Protection for Laboratories Using Chemicals - Flammability Characteristics of Common Compressed and Liquefied Gases", "US Postal Service (USPS) Hazardous Materials Table: Postal Service Mailability Guide", "US Toxic Substances Control Act (TSCA) - Inventory"

## Section 16 - OTHER INFORMATION

### LIMITED EVIDENCE

- Inhalation may produce health damage\*.
- Cumulative effects may result following exposure\*.
- Possible respiratory sensitiser\*.
- Exposure may produce irreversible effects\*.

\* (limited evidence).

*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. For additional technical information please call our toxicology department on +800 CHEMCALL.*

- 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.

A list of reference resources used to assist the committee may be found at:

[www.chemwatch.net/references](http://www.chemwatch.net/references).

- The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

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