

# Ammonium chloride-ammonium hydroxide buffer solution

sc-291894



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

Ammonium chloride-ammonium hydroxide buffer solution

### STATEMENT OF HAZARDOUS NATURE

CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

### NFPA



### SUPPLIER

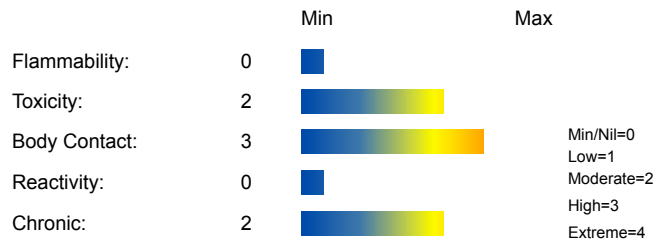
Santa Cruz Biotechnology, Inc.  
2145 Delaware Avenue  
Santa Cruz, California 95060  
800.457.3801 or 831.457.3800

### EMERGENCY:

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

## Section 2 - HAZARDS IDENTIFICATION

### CHEMWATCH HAZARD RATINGS



### CANADIAN WHMIS SYMBOLS



## EMERGENCY OVERVIEW

### RISK

Harmful by inhalation.  
Irritating to eyes and skin.  
Toxic to aquatic organisms.

## POTENTIAL HEALTH EFFECTS

### ACUTE HEALTH EFFECTS

#### SWALLOWED

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

#### EYE

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

#### SKIN

- This material can cause inflammation of the skin on contact in some persons.
- The material may accentuate any pre-existing dermatitis condition.
- Open cuts, abraded or irritated skin should not be exposed to this material.
- 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 during the course of normal handling, may be harmful.

### CHRONIC HEALTH EFFECTS

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

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.

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	%
<a href="#">ammonium hydroxide</a>	1336-21-6	5.2
<a href="#">ammonium chloride</a>	12125-02-9	0.67
<a href="#">water</a>	7732-18-5	94

## 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.

### 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.

### SKIN

■ If skin contact occurs: · Immediately remove all contaminated clothing, including footwear · Flush skin and hair with running water (and soap if available).

### 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.

## NOTES TO PHYSICIAN

- Treat symptomatically.

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, cricothyroidotomy or tracheotomy may be necessary.

for irritant gas exposures:

- the presence of the agent when it is inhaled is evanescent (of short duration) and therefore, cannot be washed away or otherwise removed

· arterial blood gases are of primary importance to aid in determination of the extent of damage. Never discharge a patient significantly exposed to an irritant gas without obtaining an arterial blood sample.

· supportive measures include suctioning (intubation may be required), volume cycle ventilator support (positive and expiratory pressure (PEEP), steroids and antibiotics, after a culture is taken

· If the eyes are involved, an ophthalmologic consultation is recommended

Occupational Medicine: Third Edition; Zenz, Dickerson, Horvath 1994 Pub: Mosby.

For acute or short term repeated exposures to ammonia and its solutions:

· Mild to moderate inhalation exposures produce headache, cough, bronchospasm, nausea, vomiting, pharyngeal and retrosternal pain and conjunctivitis. Severe inhalation produces laryngospasm, signs of upper airway obstruction (stridor, hoarseness, difficulty in speaking) and, in excessively, high doses, pulmonary edema.

· Warm humidified air may soothe bronchial irritation.

## Section 5 - FIRE FIGHTING MEASURES

Vapour Pressure (mmHG):	as per water
Upper Explosive Limit (%):	Not Available
Specific Gravity (water=1):	1
Lower Explosive Limit (%):	Not Available

### 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 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

- Non combustible
- Not considered a significant fire risk.
- The material is not readily combustible under normal conditions.
- However, it will breakdown under fire conditions and the organic component may burn.

Decomposes on heating and produces toxic fumes of: carbon dioxide (CO<sub>2</sub>), other pyrolysis products typical of burning organic material.

### FIRE INCOMPATIBILITY

- None known.

### PERSONAL PROTECTION

Glasses:

Chemical goggles.

Gloves:

1.NEOPRENE 2.BUTYL

Respirator:

Type AK Filter of sufficient capacity

## Section 6 - ACCIDENTAL RELEASE MEASURES

### MINOR SPILLS

- 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.
- Clean up all spills immediately.

- Avoid breathing vapors and contact with skin and eyes.
- 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

- DO NOT allow clothing wet with material to stay in contact with skin.
- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.

### RECOMMENDED STORAGE METHODS

- 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.
- DO NOT store near acids, or oxidizing agents.
- No smoking, naked lights, heat or ignition sources.

## 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
Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances	ammonium hydroxide (Ammonia)	25	18	40	30				
US - Minnesota Permissible Exposure Limits (PELs)	ammonium hydroxide (Ammonia)			35	27				
US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)	ammonium hydroxide (AMMONIA)	1.7							
US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)	ammonium hydroxide (AMMONIA)	0.1							
US NIOSH Recommended Exposure Limits (RELs)	ammonium hydroxide (Ammonia)	25	18	35	27				
Canada - Alberta Occupational Exposure Limits	ammonium hydroxide (Ammonia)	25	17	35	24				

Canada - British Columbia Occupational Exposure Limits	ammonium hydroxide (Ammonia)	25		35		
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	ammonium hydroxide (Ammonia)			35	27	
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants	ammonium hydroxide (Ammonia)	50	35			
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	ammonium hydroxide (Ammonia)			35	27	
US - California Permissible Exposure Limits for Chemical Contaminants	ammonium hydroxide (Ammonia)	25	18	35	27	
US - Idaho - Limits for Air Contaminants	ammonium hydroxide (Ammonia)	50	35			
US ACGIH Threshold Limit Values (TLV)	ammonium hydroxide (Ammonia)	25		35		TLV Basis: eye damage; upper respiratory tract irritation
US - Alaska Limits for Air Contaminants	ammonium hydroxide (Ammonia)			35	27	
US - Michigan Exposure Limits for Air Contaminants	ammonium hydroxide (Ammonia)			35	27	
US - Oregon Permissible Exposure Limits (Z-1)	ammonium hydroxide (Ammonia)	25	18			Bold print identifies substances for which the Oregon Permissible Exposure Limits (PELs) are different than the federal Limits.
US - Washington Permissible exposure limits of air contaminants	ammonium hydroxide (Ammonia)	25		35		
Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	ammonium hydroxide (Ammonia)	25		35		

US - Hawaii Air Contaminant Limits	ammonium hydroxide (Ammonia)	25	18	35	27	
Canada - Northwest Territories Occupational Exposure Limits (English)	ammonium hydroxide (Ammonia)	25	17	35	24	
Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)	ammonium hydroxide (Ammonia)	25	17	35	24	
US OSHA Permissible Exposure Levels (PELs) - Table Z1	ammonium hydroxide (Ammonia)	50	35			
Canada - Nova Scotia Occupational Exposure Limits	ammonium hydroxide (Ammonia)	25		35		TLV Basis: eye damage; upper respiratory tract irritation
Canada - Prince Edward Island Occupational Exposure Limits	ammonium hydroxide (Ammonia)	25		35		TLV Basis: eye damage; upper respiratory tract irritation
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants	ammonium hydroxide (Ammonia)	50	35			
Canada - Alberta Occupational Exposure Limits	ammonium chloride (Ammonium chloride fume)		10		20	
Canada - British Columbia Occupational Exposure Limits	ammonium chloride (Ammonium chloride - Fume)		10		20	
US NIOSH Recommended Exposure Limits (RELs)	ammonium chloride (Ammonium chloride fume)		10		20	
Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)	ammonium chloride (Ammonium chloride fume)		10		20	
US ACGIH Threshold Limit Values (TLV)	ammonium chloride (Ammonium chloride - Fume)		10		20	TLV Basis: Eye & upper respiratory tract irritation
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	ammonium chloride (Ammonium chloride fume)		10		20	

US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	ammonium chloride (Ammonium chloride fume)	10	20	
US - Minnesota Permissible Exposure Limits (PELs)	ammonium chloride (Ammonium chloride fume)	10	20	
US - California Permissible Exposure Limits for Chemical Contaminants	ammonium chloride (Ammonium chloride fume)	10	20	
US - Hawaii Air Contaminant Limits	ammonium chloride (Ammonium chloride - Fume)	10	20	
US - Alaska Limits for Air Contaminants	ammonium chloride (Ammonium chloride, Fume)	10	20	
Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	ammonium chloride (Ammonium chloride fume)	10	20	
Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances	ammonium chloride (Ammonium chloride - fume)	10	20	
US - Washington Permissible exposure limits of air contaminants	ammonium chloride (Ammonium chloride, fume)	10	20	
Canada - Nova Scotia Occupational Exposure Limits	ammonium chloride (Ammonium chloride - Fume)	10	20	TLV Basis: Eye & upper respiratory tract irritation
Canada - Prince Edward Island Occupational Exposure Limits	ammonium chloride (Ammonium chloride - Fume)	10	20	TLV Basis: Eye & upper respiratory tract irritation
Canada - Northwest Territories Occupational Exposure Limits (English)	ammonium chloride (Ammonium chloride - fume)	10	20	
US - Michigan Exposure Limits for Air Contaminants	ammonium chloride (Ammonium chloride fume)	10	20	
US - Oregon Permissible Exposure Limits (Z-1)	ammonium chloride (Ammonium Chloride Fumes)	10		Bold print identifies substances for which the Oregon Permissible Exposure

Limits (PELs) are different than the federal Limits.

US OSHA Permissible Exposure Levels (PELs) - Table Z3	ammonium chloride (Inert or Nuisance Dust: (d) Respirable fraction)	5	
US OSHA Permissible Exposure Levels (PELs) - Table Z3	ammonium chloride (Inert or Nuisance Dust: (d) Total dust)	15	
US - Oregon Permissible Exposure Limits (Z-3)	ammonium chloride (Inert or Nuisance Dust:(d) Respirable fraction)	5	Oregon Permissible Exposure Limits (PELs) are different than the federal limits.
US - Oregon Permissible Exposure Limits (Z-3)	ammonium chloride (Inert or Nuisance Dust: (d) Total dust)	10	Oregon Permissible Exposure Limits (PELs) are different than the federal limits.
US TSCA New Chemical Exposure Limits (NCEL)	ammonium chloride (Halogenated alkene (P84-105))	0.05	
Canada - Ontario Occupational Exposure Limits	ammonium chloride (Specified (PNOS) / Particules (insolubles ou peu solubles) non précisées par ailleurs)	3 (R)	
Canada - Ontario Occupational Exposure Limits	ammonium chloride (Particles (Insoluble or Poorly Soluble) Not Otherwise)	10 (I)	

**ENDOELTABLE**

The following materials had no OELs on our records

- water: CAS:7732-18-5

**PERSONAL PROTECTION**



**RESPIRATOR**

•Type AK Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

**EYE**

• Safety glasses with side shields.



- Chemical goggles.

## HANDS/FEET

- Wear chemical protective gloves, eg. PVC.

Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include:

- 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, AS/NZS 2161.1 or national equivalent).

- 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, AS/NZS 2161.10.1 or national equivalent) 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, AS/NZS 2161.10.1 or national equivalent) 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

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

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

## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

### PHYSICAL PROPERTIES

Mixes with water.

Corrosive.

Alkaline.

State	LIQUID	Molecular Weight	Not Applicable
Melting Range (°F)	32 approx	Viscosity	Not Available
Boiling Range (°F)	212 approx	Solubility in water (g/L)	Miscible
Flash Point (°F)	Not Available	pH (1% solution)	Not Available
Decomposition Temp (°F)	Not Available	pH (as supplied)	10.08 - 10.12
Autoignition Temp (°F)	Not Available	Vapour Pressure (mmHG)	as per water
Upper Explosive Limit (%)	Not Available	Specific Gravity (water=1)	1
Lower Explosive Limit (%)	Not Available	Relative Vapor Density (air=1)	as per water
Volatile Component (%vol)	Not Available	Evaporation Rate	as per water

### APPEARANCE

Clear, colourless solution with ammonia odour; miscible with water.

## Section 10 - CHEMICAL STABILITY

### CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.

### STORAGE INCOMPATIBILITY

- Avoid strong acids.

- Avoid contact with copper, aluminium and their alloys.

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 tetroxide, nitrogen trichloride, nitryl 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.

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

## Section 11 - TOXICOLOGICAL INFORMATION

Mallinckrodt Baker Ammonium Chloride-Hydroxide Buffer

### TOXICITY AND IRRITATION

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

WATER:

MALLINCKRODT BAKER AMMONIUM CHLORIDE-HYDROXIDE BUFFER:

- No significant acute toxicological data identified in literature search.

AMMONIUM CHLORIDE:

AMMONIUM HYDROXIDE:

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

AMMONIUM HYDROXIDE:

MALLINCKRODT BAKER AMMONIUM CHLORIDE-HYDROXIDE BUFFER:

- 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.

AMMONIUM HYDROXIDE:

TOXICITY	IRRITATION
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	

### TOXICITY

### IRRITATION

**AMMONIUM CHLORIDE:**

Oral (rat) LD50: 1650 mg/kg

Eye  
(rabbit):  
500  
mg/24h  
SEVERE

Intraperitoneal (rat) LD50: 3250 mg/kg	Eye (rabbit): 100 mg SEVERE
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### CARCINOGEN

ammonium hydroxide	US - Rhode Island Hazardous Substance List	IARC
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ammonium chloride	US - Rhode Island Hazardous Substance List	IARC	
ORGANIC BROMINE COMPOUNDS	US Environmental Defense Scorecard Suspected Carcinogens	Reference(s)	P65-MC
PBIT_(PERS~	US - Maine Chemicals of High Concern List	Carcinogen	

## Section 12 - ECOLOGICAL INFORMATION

Toxic to aquatic organisms.  
This material and its container must be disposed of as hazardous waste.

## 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.

‡ 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.

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: UN2922 PG: III

Label Codes: 8, 6.1 Special provisions: IB3, T7, TP1, TP28

Packaging: Exceptions: 154 Packaging: Non- bulk: 203

Packaging: Exceptions: 154 Quantity limitations: 5 L

Passenger aircraft/rail:

Quantity Limitations: Cargo 60 L Vessel stowage: Location: B aircraft only:

Vessel stowage: Other: 40

Hazardous materials descriptions and proper shipping names:

Corrosive liquids, toxic, n.o.s.

### Air Transport IATA:

UN/ID Number: 2922 Packing Group: III

Special provisions: A3

Cargo Only

Packing Instructions: 856 Maximum Qty/Pack: 60 L

Passenger and Cargo Passenger and Cargo

Packing Instructions: Y841 Maximum Qty/Pack: 5 L

Passenger and Cargo Limited Quantity Passenger and Cargo Limited Quantity

Packing Instructions: 852 Maximum Qty/Pack: 1 L

Shipping Name: CORROSIVE LIQUID, TOXIC, N.O.S. \*(CONTAINS AMMONIUM HYDROXIDE )

### Maritime Transport IMDG:

IMDG Class: 8 IMDG Subrisk: 6.1

UN Number: 2922 Packing Group: III

EMS Number: F-A,S-B Special provisions: 223 274  
Limited Quantities: 5 L  
Shipping Name: CORROSIVE LIQUID, TOXIC, N.O.S.(contains ammonium hydroxide )

## Section 15 - REGULATORY INFORMATION

### Regulations for ingredients

#### **ammonium hydroxide (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 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", "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) - Chemical Substance Inventory"

#### **ammonium chloride (CAS: 12125-02-9,152128-19-3) is found on the following regulatory lists;**

"Canada - Alberta Occupational Exposure Limits", "Canada - British Columbia Occupational Exposure Limits", "Canada - Northwest Territories Occupational Exposure Limits (English)", "Canada - Nova Scotia Occupational Exposure Limits", "Canada - Prince Edward Island Occupational Exposure Limits", "Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)", "Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits", "Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances", "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", "GESAMP/EHS Composite List - GESAMP Hazard Profiles", "IMO Provisional Categorization of Liquid Substances - List 1: Pure or technically pure products", "International Council of Chemical Associations (ICCA) - High Production Volume List", "US - Alaska Limits for Air Contaminants", "US - California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List", "US - California Permissible Exposure Limits for Chemical Contaminants", "US - Connecticut Hazardous Air Pollutants", "US - Hawaii Air Contaminant Limits", "US - Massachusetts Oil & Hazardous Material List", "US - Michigan Exposure Limits for Air Contaminants", "US - Minnesota Hazardous Substance List", "US - Minnesota Permissible Exposure Limits (PELs)", "US - New Jersey Right to Know Hazardous Substances", "US - Oregon Permissible Exposure Limits (Z-1)", "US - Pennsylvania - Hazardous Substance List", "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 ACGIH Threshold Limit Values (TLV)", "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 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 NIOSH Recommended Exposure Limits (RELs)", "US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory"

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

"Canada Domestic Substances List (DSL)", "Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (English)", "IMO IBC Code Chapter 18: List of products to which the Code does not apply", "International Fragrance Association (IFRA) Survey: Transparency List", "US - Pennsylvania - Hazardous Substance List", "US DOE Temporary Emergency Exposure Limits (TEELs)", "US NFPA 30B Manufacture and Storage of Aerosol Products - Chemical Heat of Combustion", "US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory", "US TSCA Section 8 (a) Inventory Update Rule (IUR) - Partial Exemptions"

#### **No data for Mallinckrodt Baker Ammonium Chloride-Hydroxide Buffer (CW: 2097392)**

## Section 16 - OTHER INFORMATION

### LIMITED EVIDENCE

- Ingestion may produce health damage\*.
  - Cumulative effects may result following exposure\*.
- \* (limited evidence).

### Ingredients with multiple CAS Nos

Ingredient Name CAS ammonium chloride 12125-02-9, 152128-19-3

*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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