GARDENA, CA
NEW BRUNSWICK, NJ

Material Safety Data Sheet

NFPA	HMIS	Personal Protective Equipment
	Health Hazard 3 Fire Hazard 0 Reactivity 0	 See Section 15.

Section 1. Chemical Product and Company Identification

Common Name/ Trade Name: Ammonium Chloride-Ammonium Hydroxide TS

Manufacturer: SPECTRUM LABORATORY PRODUCTS INC.
14422 S. SAN PEDRO STREET
GARDENA, CA 90248

Commercial Name(s): Not available.

Synonym: Not available.

Chemical Name: Not applicable.

Chemical Family: (Alkali.)

Chemical Formula: Not applicable.

Supplier: SPECTRUM LABORATORY PRODUCTS INC.
14422 S. SAN PEDRO STREET
GARDENA, CA 90248

Catalog Number(s).: A-323

CAS#: Mixture.

RTECS: Not applicable.

TSCA: TSCA 8(b) inventory: Ammonium hydroxide; Ammonium chloride; Water

CI#: Not applicable.

IN CASE OF EMERGENCY
CHEMTREC (24hr) 800-424-9300

CALL (310) 516-8000

Section 2.Composition and Information on Ingredients

		Exposure Limits			
Name	**CAS #**	**TWA (mg/m³)**	**STEL (mg/m³)**	**CEIL (mg/m³)**	**% by Weight**
1) Ammonia, anhydrous	7664-41-7	50	35		13.5-15.5
2) Water	7732-18-5				54.5-56.5
3) Ammonium chloride	12125-02-9	10	20		30

Toxicological Data on Ingredients

Ammonia, anhydrous:
GAS (LC50): Acute: 2000 ppm 4 hours [Rat]. 4230 ppm 1 hours [Mouse].

Ammonium chloride:
ORAL (LD50): Acute: 1650 mg/kg [Rat]. 1300 mg/kg [Mouse].

Section 3. Hazards Identification

Potential Acute Health Effects

Very hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion. Hazardous in case of skin contact (corrosive), of eye contact (corrosive). Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Continued on Next Page

Potential Chronic Health Effects	Slightly hazardous in case of skin contact (sensitizer). **CARCINOGENIC EFFECTS**: Not available. **MUTAGENIC EFFECTS**: Mutagenic for bacteria and/or yeast. [Ammonia, anhydrous]. **TERATOGENIC EFFECTS**: Not available. **DEVELOPMENTAL TOXICITY**: Not available. The substance may be toxic to lungs, mucous membranes, upper respiratory tract, skin, eyes. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4. First Aid Measures

Eye Contact	Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Get medical attention immediately. Finish by rinsing thoroughly with running water to avoid a possible infection.
Skin Contact	In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.
Serious Skin Contact	Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.
Inhalation	If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
Serious Inhalation	Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.
Ingestion	Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.
Serious Ingestion	Not available.

Section 5. Fire and Explosion Data

Flammability of the Product	Non-flammable.
Auto-Ignition Temperature	Not applicable.
Flash Points	Not applicable.
Flammable Limits	Not applicable.
Products of Combustion	Not available.
Fire Hazards in Presence of Various Substances	Not applicable.
Explosion Hazards in Presence of Various Substances	Non-explosive in presence of open flames and sparks, of shocks.
Fire Fighting Media and Instructions	Not applicable.
Special Remarks on Fire Hazards	Not available.

Continued on Next Page

Special Remarks on Explosion Hazards	A sudden increase in temperature and pressure preceded a violent explosion when heating 1-chloro-2,4-dinitrobenzene and ammonia in a direct fired autoclave. Reaction with liquid ammonia and chlorine azide gives an explosive yellow liquid. Liquid ammonia + 1,2 dichloroethane may explode. Passing ammonia gas over magnesium perchlorate dessicant causes intensive drying of ammonia gas which leads to an exotherm, followed by a violent explosion. Ammonia is capable of reacting with some heavy metal compounds (gold, silver, mercury) to produce materials, some of uncertain constitution, which may explode violently when dry. Action of ammonia or ammonium salts on gold (III) chloride, oxide or other salts under a variety of conditions gives explosive or "fulminating" gold. Halogens or interhalogens + ammonia either reacts violently or produces explosive products. Ammonia + nitrogen trichloride produces endothermic and explosive nitrogen trichloride. Reaction of ammonia + selenium difluoride dioxide is violent and many of the products and derivatives are both shock and heat sensitive explosives. These include ammonium, potasssium silver and thallium salts of the "triselenimidate" ion. Violent explosions with ammonia + nitrogen oxide can occur in ammonia synthesis gas units. Liquid ammonia + solid dinitrogen tetraoxide reacts explosively. Oxygen + Platinium: oxidation of ammonia to nitric acid over platinium catalysts, substituion of oxygen for air causes fairly vigorous explosions. Thiocarbonyl azid thiocyanate reacts explosively with ammonia gas. Thiotrithiazyl chloride will rapidly absorb ammonia gas and then explode. Tetramethylammonium amide decomposes explosively at ambient temp. in presence of ammonia. Liquid ammonia + tellurium tetrachloride at -15 C forms tellurium nitride which explodes at 200 C. Ammonia + tellurium tetrabromide gives a mixture of tritellurium tetramitride and tellulrium bromide nitride, which explodes on heating. Liquid ammonia + ethylene oxide causes violent polymerization and a vapor cloud explosion. Ammonia + picric acid forms explosive salts. (Ammonia, anhydrous) Forms explosive compounds with many heavy metals such as silver, lead, zinc and their halide salts. It can form shock sensitive compounds with halogens, mercury oxide, and siliver oxide. (Ammonium Hydroxide) Explosive reaction between bromine trifluoride and ammonium halides. (Ammonium Chloride)

Section 6. Accidental Release Measures

Small Spill	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: **Neutralize the residue with a dilute solution of acetic acid.**
Large Spill	Corrosive liquid. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. **Neutralize the residue with a dilute solution of acetic acid.** Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7. Handling and Storage

Precautions	Keep container dry. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, acids.
Storage	Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8. Exposure Controls/Personal Protection

Engineering Controls	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection	Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.
Personal Protection in Case of a Large Spill	Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.
Exposure Limits	

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Ammonia, anhydrous
TWA: 17 STEL: 24 (mg/m³) from ACGIH (TLV) [United States] Inhalation
TWA: 25 STEL: 35 (ppm) from ACGIH (TLV) [USA] Inhalation
TWA: 50 (ppm) from OSHA (PEL) [USA] Inhalation
TWA: 35 (mg/m³) from OSHA (PEL) [USA] Inhalation
TWA: 25 STEL: 35 (ppm) [United Kingdom (UK)] Inhalation
TWA: 18 STEL: 15 (mg/m³) [United Kingdom (UK)] Inhalation
Ammonium Hydroxide
TWA: 25 (ppm) from ACGIH (TLV) [United States]
TWA: 50 STEL: 35 (ppm) from OSHA (PEL) [United States]
TWA: 25 STEL: 35 from NIOSH
Ammonium chloride
TWA: 10 STEL: 20 (mg/m³) from ACGIH (TLV) [United States] Inhalation
TWA: 10 STEL: 20 (mg/m³) [United Kingdom (UK)] Inhalation
TWA: 10 STEL: 20 (mg/m³) from NIOSH [United States] Inhalation
TWA: 10 STEL: 20 (mg/m³) from OSHA (PEL) [United States]

Consult local authorities for acceptable exposure limits.

Section 9. Physical and Chemical Properties

Physical state and appearance	Liquid.
Molecular Weight	Not applicable.
pH (1% soln/water)	Basic.

Odor	Ammonia-like
Taste	Acrid.
Color	Colorless.

Boiling Point	The lowest known value is 100°C (212°F) (Water).
Melting Point	Not available.
Critical Temperature	Not available.
Specific Gravity	Weighted average: 1.06 (Water = 1)
Vapor Pressure	The highest known value is 2.3 kPa (@ 20°C) (Water).
Vapor Density	The highest known value is 0.62 (Air = 1) (Water).
Volatility	Not available.
Odor Threshold	Not available.
Water/Oil Dist. Coeff.	Not available.
Ionicity (in Water)	Not available.
Dispersion Properties	See solubility in water, methanol, diethyl ether.
Solubility	Easily soluble in cold water, hot water. Soluble in methanol, diethyl ether. Insoluble in acetone.

Section 10. Stability and Reactivity Data

Stability	The product is stable.
Instability Temperature	Not available.
Conditions of Instability	Incompatible materials
Incompatibility with various substances	Reactive with oxidizing agents, acids. Slightly reactive to reactive with metals, alkalis.
Corrosivity	Not available

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Special Remarks on Reactivity	Halogens, salts of silver and zinc, air and hydrocarbons, calcium, 1-chloro-2,4-dinitrobenzene, chloroformamidinium nitrate, 2-chloronitrobenzene, chlorine azide, magnesium perchlorate, halogens or interhalogens, iodine, potassium, nitrogen trichloride, potassium chlorate, nitryl chloride, chromyl chloride, chromium trioxide, trioxygen difluoride, selenium difluoride dioxide, nitric acid, hydrogen peroxide, nitrogen oxide, dinitrogen tetraoxide, oxygen, platinium, silver chloride, thiocarbonyl azide thiocyanate, sulfinyl chloride, thiotrithiazyl chloride, tetramethylammonium amide, tellurium tetrachloride, tellurium tetrabromide, silver (I) oxide, dichlorine oxide, silver nitrate, ethylene oxide, acetaldehyde, acrolein, boron boron triiodide, bromine, bromine pentafluoride, fluorine, chloric acid, chlorine monoxide, chlorine trifluoride, chlorites, chlorosilane, chromic anhydride, ethylene dichloride, hydrogen bromide, hypochlorous acid, nitrogen peroxide, fluorine, some heavy metals (gold, silver, mercury), hexachloromelamine, hydrazine, alkali metals, nitrogen trifluoride, oxygen difluoride, phosphorous trioxide, potassium and arsine, potassium and phosphine, potassium and sodium nitrite, potassium ferricyanide, potassium mercuricyanide, sodium and carbon monoxide, stibine, sulfur, sulfur dichloride, tellurium hydropentachloride, trichloromelamine. (Ammonia, anhydrous) Halogens, salts of silver and zinc, air and hydrocarbons, calcium, 1-chloro-2,4-dinitrobenzene, chloroformamidinium nitrate, 2-chloronitrobenzene, chlorine azide, magnesium perchlorate, halogens or interhalogens, iodine, potassium, nitrogen trichloride, potassium chlorate, nitryl chloride, chromyl chloride, chromium trioxide, trioxygen difluoride, selenium difluoride dioxide, nitric acid, hydrogen peroxide, nitrogen oxide, dinitrogen tetraoxide, oxygen, platinium, silver chloride, thiocarbonyl azide thiocyanate, sulfinyl chloride, thiotrithiazyl chloride, tetramethylammonium amide, tellurium tetrachloride, tellurium tetrabromide, silver (I) oxide, dichlorine oxide, silver nitrate, ethylene oxide, acetaldehyde, acrolein, boron, boron triiodide, bromine, bromine pentafluoride, fluorine, chloric acid, chlorine monoxide, chlorine trifluoride, chlorites, chlorosilane, chromic anhydride, ethylene dichloride, hydrogen bromide, hypochlorous acid, nitrogen peroxide, fluorine, some heavy metals (gold, silver, mercury), hexachloromelamine, hydrazine, alkali metals, nitrogen trifluoride, oxygen difluoride, phosphorous trioxide, potassium and arsine, potassium and phosphine, potassium and sodium nitrite, potassium ferricyanide, potassium mercuricyanide, sodium and carbon monoxide, stibine, sulfur, sulfur dichloride, tellurium hydropentachloride, trichloromelamine, Organic acids, amides, organic anhydrides, isocyanates, vinyl acetate, epichlorhydrin, aldehydes, Acrylic acid, chlorosulfonic acid, dimethyl sulfate, fluorine, gold + aqua regia, hydrochloric acid, hydrofluoric acid, hydrogen peroxide, iodine, nitric acid, olelum, propiolactone, propylene oxide, silver nitrate, silver oxide + ethyl alcohol, nitromethane, silver permanganate, sulfuric acid, gold, mercury, and halide salts.. Forms explosive compounds with many heavy metals (silver, lead, zinc) (Ammonium Hydroxide) Incompatible with lead and silver salts. It can react violently with ammonium nitrate and potassium chlorate. Also incompatible with bromine trifluoride, ammonium halides, bromine pentafluoride, alkalis and their carbonates. At fire temperature, ammonium chloride may dissociate into ammonia and hydrogen chloride. (Ammonium Chloride)
Special Remarks on Corrosivity	Not available
Polymerization	Will not occur.

Section 11. Toxicological Information

Routes of Entry	Absorbed through skin. Eye contact. Inhalation. Ingestion.
Toxicity to Animals	Acute oral toxicity (LD50): 1300 mg/kg [Mouse]. (Ammonium chloride). Acute oral toxicity (LD50): 350 mg/kg [Rat]. (Ammonium Hydroxide).
Chronic Effects on Humans	**MUTAGENIC EFFECTS**: Mutagenic for bacteria and/or yeast. [Ammonia, anhydrous]. Contains material which may cause damage to the following organs: lungs, mucous membranes, upper respiratory tract, skin, eyes.
Other Toxic Effects on Humans	Very hazardous in case of skin contact (irritant), of ingestion. Hazardous in case of skin contact (corrosive), of eye contact (corrosive), of inhalation.
Special Remarks on Toxicity to Animals	Lowest Published Lethal Dose LCL [Human] - Route: Inhalation; Dose: 5000 ppm/5M (Ammonia, anhydrous)
Special Remarks on Chronic Effects on Humans	May affect genetic material based on tests with microorganisms and animals. May cause cancer (tumorigenic) based on animal data. No human data found at this time. (Ammonia, anhydrous)
Special Remarks on other Toxic Effects on Humans	

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Acute Potential Health Effects:
Skin: Causes severe irritation. Causes skin burns. May cause deep, penetrating ulcers of the skin. Contact with skin may cause staining, inflammation, and thickening of the skin.
Eye: Contact with liquid or vapor causes severe burns and possible irreversible eye damage including corneal injury and cataracts.
Inhalation: Causes severe irritation of the upper respiratory tract with coughing, burns, breathing difficulty. May cause acute pulmonary edema, pneumoconiosis, fibrosis, and even coma. It is a respiratory stimulant when inhaled at lower concentrations. It may also affect behavior/central nervous system (convulsions, seizures, somnolence, confusion, drowsiness, tremor, ataxia, tremor), cardiovascular system (increase in blood pressure and pulse rate).
Ingestion: Harmful if swallowed. Affects the Gastrointestinal tract (burns, swelling of the lips, mouth, and larynx, throat constriction, nausea, vomiting, thirst, convulsions, shock, and may cause severe and permanent damage), liver, and urinary system (kidneys). May affect behavior (convulsions, seizures, somnolence, confusion, drowsiness, tremor, ataxia, excitement), eyes (Mydriasis), cardiovascular system (bradycardia), respiration (respiratory stimulation, apnea, hyperventilation, pulmonary edema). May cause serious metabolic acidosis with hypokalemia. Transient hyperglycemia and glycosuria may also occur.
Chronic Potential Health Effects:
Ingestion: May cause effects similar to those of acute ingestion. It may also affect metabolism (anorexia, metabolic acidosis)
Inhalation: Repeated exposure to low concentrations may cause bronchitis or bronchospasm (asthma) with cough, phlegm, and/or shortness of breath. May also cause liver and kidney damage, and affect the brain, and blood.
Eye: May cause corneal damage and the development of cataracts and glaucoma.
Skin: Repeated skin contact to low concentrations may cause dryness, itching, and redness (dermatitis).

Section 12. Ecological Information

Ecotoxicity	Not available.
BOD5 and COD	Not available.
Products of Biodegradation	Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.
Toxicity of the Products of Biodegradation	The products of degradation are less toxic than the product itself.
Special Remarks on the Products of Biodegradation	Not available.

Section 13. Disposal Considerations

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

Section 14. Transport Information

DOT Classification	Class 8: Corrosive material
Identification	: Ammonia Solution UNNA: 2672 PG: III
Special Provisions for Transport	Not available.
DOT (Pictograms)	

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Section 15. Other Regulatory Information and Pictograms

Federal and State Regulations

Connecticut hazardous material survey.: Ammonium hydroxide
Illinois toxic substances disclosure to employee act: Ammonium hydroxide; Ammonium chloride
Illinois chemical safety act: Ammonium hydroxide; Ammonium chloride
New York release reporting list: Ammonium hydroxide; Ammonium chloride
Rhode Island RTK hazardous substances: Ammonium chloride
Pennsylvania RTK: Ammonium hydroxide; Ammonium chloride
Minnesota: Ammonium chloride
Massachusetts RTK: Ammonium hydroxide; Ammonium chloride
Massachusetts spill list: Ammonium hydroxide; Ammonium chloride
New Jersey: Ammonium hydroxide; Ammonium chloride
New Jersey spill list: Ammonium hydroxide; Ammonium chloride
New Jersey toxic catastrophe prevention act: Ammonium hydroxide
Louisiana spill reporting: Ammonium hydroxide; Ammonium chloride
California Director's List of Hazardous Substances: Ammonium Hydroxide (Ammonia); Ammonium Chloride
TSCA 8(b) inventory: Ammonium hydroxide; Ammonium chloride; Water
CERCLA: Hazardous substances.: Ammonium hydroxide: 1000 lbs. (453.6 kg); Ammonium chloride: 5000 lbs. (2268 kg);

California Proposition 65 Warnings

California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: No products were found.

California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: No products were found.

Other Regulations

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications

WHMIS (Canada)

CLASS E: Corrosive liquid.

DSCL (EEC)

R20/22- Harmful by inhalation and if swallowed.
R34- Causes burns.

S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S36/37/39- Wear suitable protective clothing, gloves and eye/face protection.
S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S46- If swallowed, seek medical advice immediately and show this container or label.

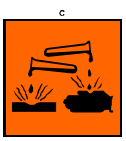
HMIS (U.S.A.)

Health Hazard	3
Fire Hazard	0
Reactivity	0
Personal Protection	

National Fire Protection Association (U.S.A.)

WHMIS (Canada) (Pictograms)

DSCL (Europe) (Pictograms)



TDG (Canada) (Pictograms)

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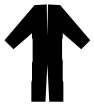
ADR (Europe) (Pictograms)

Protective Equipment

Gloves.



Full suit.

Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.

Face shield.

Section 16. Other Information

MSDS Code	**A323S**
References	Not available.
Other Special Considerations	Not available.

Validated by Sonia Owen on 11/28/2006.

Verified by Sonia Owen.

Printed 11/28/2006.

CALL (310) 516-8000

Notice to Reader

All chemicals may pose unknown hazards and should be used with caution. This Material Safety Data Sheet (MSDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this MSDS. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this MSDS is based on technical data judged to be reliable, Spectrum Quality Products, Inc. assumes no responsibility for the completeness or accuracy of the information contained herein.