MSDS • Ammonium Hydroxide

Loose in the Lab, Inc.
9462 South 560 West
Sandy, Utah 84070

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SECTION 1 • CHEMICAL PRODUCT

Product Name: Ammonium hydroxide CAS#: 1336-21-6
RTECS: BQ9625000
TSCA: TSCA 8(b) inventory: Ammonium hydroxide
CI#: Not applicable.
Synonym:Aqueous Ammonia; Strong Ammonia Solution; Stronger Ammonia Water

Chemical Name: Ammonium Hydroxide . Chemical Formula: NH3

SECTION 2 • COMPOSITION, INFORMATION ON INGREDIENTS

Composition	**Common Name**	**CAS** #	% by Weight
	Water	7732-18-5	85
	Ammonium Hydroxide	1336-21-6	15

Toxicological Data on Ingredients: Ammonia, anhydrous: GAS (LC50): Acute: 2000 ppm 4 hours [Rat]. 4230 ppm 1 hours [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, permeator), 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. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Potential Chronic Health Effects: 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 mucous membranes, 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.

SECTION 4 • FIRST AID MEASURES

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention.

Skin Contact: In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion: Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Serious Ingestion: Not available.

SECTION 5 • FIRE FIGHTING MEASURES

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: Not applicable
Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.
Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards: It may burn, but it will not ignite. Fire may produce irritating, corrosive and/or toxic gases. 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 exothermic, 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.

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. 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:

Do not ingest. Do not breathe dust. Wear suitable protective clothing. 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.

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:

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 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)] InhalationConsult local authorities for acceptable exposure limits.

SECTION 9 • PHYSICAL AND CHEMICAL PROPERTIES

Physical state and appearance: Liquid.
Odor: Ammoniacal.
Taste: Not available.
Molecular Weight: Not applicable.
Color: Clear Colorless.
pH (1% soln./water): Basic.
Boiling Point: The lowest known value is 100°C (212°F) (Water).
Melting Point: Not available.
Critical Temperature: Not available.
Specific Gravity: Weighted average: 0.96 (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.

SECTION 10 • STABILITY AND REACTIVITY

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

Corrosivity: Extremely corrosive in presence of copper. Corrosive in presence of aluminum. Non-corrosive in presence of glass, of stainless steel(304), of stainless steel.

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) Incompatible with the following: Organic acids, amides, organic anhydrides, isocyanates, vinyl acetate, epichlorhydrin, aldehydes, Acrolein, 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, silver oxide + ethyl alcohol, nitromethane, silver permanganate, sulfuric acid, halogens. Forms explosive compounds with many heavy metals (silver, lead, zinc) and halide salts. (Ammonium Hydroxide)

Special Remarks on Corrosivity:

Dissolves copper and zinc. Corrosive to aluminum and its alloys. Corrosive to galvanized surfaces. Severe corrosive effect on brass and bronze

Polymerization: Will not occur.

SECTION 11 • TOXICOLOGICAL INFORMATION

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals: Acute oral toxicity(LD50): 350 mg/kg [Rat].

Chronic Effects on Humans:MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. [Ammonia, anhydrous]. Contains material which may cause damage to the following organs: mucous membranes, skin, eyes.

Other Toxic Effects on Humans: Very hazardous in case of skin contact (irritant), of ingestion, . Hazardous in case of skin contact (corrosive, permeator), of eye contact (corrosive), of inhalation (lung corrosive).

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

Special Remarks on other Toxic Effects on Humans: 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, ataxia, tremor), cardiovascular system (increase in blood pressure and pulse rate). Ingestion: Harmful if swallowed. Affects the Gastrointestinal tract (burns, throat constriction, vomiting, convulsions, shock, and may cause severe and permanent damage), liver, and urinary system (kidneys) May affect behavior (convulsions, seizures, ataxia, excitement). Chronic Potential Health Effects: Ingestion: May cause effects similar to those of acute ingestion. Inhalation: Repeated exposure to low concentrations may cause bronchitis 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.

SECTION 15 • REGULATORY INFORMATION

Federal and State Regulations:

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

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

Other Classifications: WHMIS (Canada): Not controlled under WHMIS (Canada).

DSCL (EEC): R20- Harmful by inhalation. R34- Causes burns. S1/2- Keep locked up and out of the reach of children. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S36/37- Wear suitable protective clothing and gloves. S39- Wear 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.):
- Health: 2
- Flammability: 0
- Reactivity: 0
- Specific hazard:

Protective Equipment:

Gloves. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Face shield.

SECTION 16 • OTHER INFORMATION

This Material Safety Data Sheet (MSDS) is to provided to you for your guidance only and is based upon publicly available information and tests that are believed to be reliable. However, Loose in the Lab, Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. This data is offered solely for your evaluation, consideration, investigation, and verification. The data should not be confused with local, state, federal or insurance mandates, regulations, or requirements and CONSTITUTE NO WARRANTY. Any use of this data and information must be determined by the science instructor purchasing and using the materials to be in accordance with applicable local, state or federal laws and regulations in addition to the mandates and guidelines of their specific school district.

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