

Material Safety Data Sheet

(10600)

Section 1: Chemical Product and Company Identification

Product Name: Ammonium hydroxide

Catalog Number: 10600

CAS#: see Section 2

Contact Information:

Electron Microscopy Sciences

1560 Industry Road

Hatfield, PA 19440

1-215-412-8400 (phone)

1-800-523-5874 (toll-free)

1-215-412-8450 (fax)

Order Online: emsdiasum.com

CHEMTREC (24-Hour Emergency

Telephone), call: 1-800-424-9300

Section 2: Composition and Information on Ingredients

	CAS #	Exposure Limits			% by Weight
		TWA (mg/m ³)	STEL (mg/m ³)	CEIL (mg/m ³)	
Ammonia, anhydrous	7664-41-7	50	35		27-31
Water	7732-18-5				69-73

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 (corrosive, irritant, permeator), of eye contact (irritant), of ingestion. Non-corrosive to the eyes. Non-corrosive for lungs. 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.

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 is toxic to 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 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 irritation 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 air to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek medical attention.

Ingestion: If swallowed, 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 immediately.

Serious Ingestion: Not available

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable

Autoignition Temperature: Not applicable

Flash Points: Not applicable

Flammable Limits: Not applicable

Products of Combustion: Hazardous decomposition include Nitric oxide, and ammonia fumes.

Fire 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 applicable

Special Remarks on Explosion Hazards: 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 silver oxide.

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. Poisonous 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 the local authorities.

Section 7 : Handling and Storage

Precautions: 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 metals, 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 of 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. 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:

TWA: 25 (ppm) from ACGIH (TLV) [United States]

TWA: 50 STEL: 35 (ppm) from OSHA (PEL) [United States]

TWA: 25 STEL: 35 from NIOSH

Consult local authorities for acceptable exposure limits

Section 9: Physical and Chemical Properties

Physical State and appearance: Liquid

Molecular Weight: 35.05

pH (1% soln/water): 11.6 [Basic] This is the actual pH in a 1 N solution.

Boiling Point: Not available

Melting Point: -69.2°C (-92.6°F)

Critical Temperature: Not available

Specific Gravity: 0.898 (Water=1)

Vapor Pressure: 287.9 kPa (@ 20°C)

Vapor Density: Not available

Volatility: Not available

Other Threshold: 5-50 ppm as ammonia

Water/Oil Dist. Coeff.: Not available

Ionicity (in Water): Not available

Dispersion Properties: See solubility in water

Solubility: Easily soluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials, high temperatures

Incompatibility with various substances: Highly reactive with metals. Reactive with acids. Slightly reactive to reactive with oxidizing agents.

Corrosivity: Extremely corrosive in presence of zinc, of copper. Corrosive in presence of aluminum. Non-corrosive in presence of glass, of stainless steel (304), of stainless steel (316).

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, nitril chloride, chromyl chloride, chromium trioxide, trioxygen difluoride, selenium difluoride dioxide, nitric acid, hydrogen peroxide, nitrogen oxide, dinitrogen tetroxide, oxygen, platinum, silver chloride, thiocarbonyl azide thiocyanate, sulfinyl chloride, thiotriazyl 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 hypopentachloride, 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, oleum, 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).

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, liquid ammonia or ammonium hydroxide will attack some forms of plastics, rubber and coatings such as ABS, Acetal, Hytrel, Buna (Nitrile), Natural Rubber, LDPE, Nylon, Polycarbonate, Hypalon and Viton.

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. [Ammonium hydroxide]. May cause damage to the following organs: mucous membranes, skin, eyes.

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

Special Remarks on Toxicity to Animals: Highly toxic to aquatic organisms.

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:

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, swelling of the lips, mouth, and larynx, throat constriction, nausea, 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.
Eyes: 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: Ecotoxicity in water (LC50): 0.1 ppm 24 hours [Rainbow trout]. 8.2 mg/l 96 hours [Fathead minnow]. 0.1 ppm 48 hours [Bluegill].

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: Other 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 (8 CCR 339): Ammonium hydroxide
TSCA 8(b) inventory: Ammonium hydroxide
CERCLA: Hazardous substances: Ammonium hydroxide: 1000 lbs. (453.6 kg)

California Proposition 65 Warnings: California Prop. 65. This product contains the following ingredients for which the State of California as 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)

EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances (EINECS No. 215-647-6).

Canada: Listed on Canadian Domestic Substance List (DSL).

China: Listed on National Inventory.

Japan: Listed on National Inventory (KECI).

Philippines: Listed on National Inventory (PICCS).

Australia: Listed on AICS.

Other Classifications:

WHMIS (Canada): Class E: Corrosive Liquid

DSCL (EEC): R34 – Causes burns

R50 – Very toxic to aquatic organisms

S24/25 – Avoid contact with skin and eyes.

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).

S61 – Avoid release to the environment. Refer to special instructions/safety data sheets.

HMIS (U.S.A.): Health Hazard: 3, Fire Hazard: 0, Reactivity: 0

National Fire Protection Association (U.S.A.): Health:2, Flammability: 0, Reactivity: 0

Section 16: Other Information:

Last Updated: 11/13/11

Date Verified and Printed: 11/13 /11

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Electron Microscopy Sciences be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Electron Microscopy Sciences has been advised of the possibility of such damages.