

Ammonium Hydroxide 29%

Date of Preparation: August 2003

Revision: 2

Section 1 - Chemical Product and Company Identification**Product/Chemical Name:** Ammonium Hydroxide, Ammonia Water**Chemical Formula:** NH₄OH**Other Designations:** Ammonium Hydroxide; Ammonia Solution; Ammonia Water; Ammonia, Monohydrate; Ammonium Hydrate; Aqua Ammonia**General Use:** Reagent, pH adjustment; manufacture of ammonium salts and aniline salts.**Manufacturer:** Kanto Corporation, 13424 N. Woodrush Way, Portland, OR 97203**Non-Emergency Contact:** Customer Service, Phone (503) 283-0405, FAX (503) 240-0409**For All Transportation Emergencies Call CHEMTREC 1-800- 424-9300****Section 2 - Composition / Information on Ingredients**

Ingredient Name	CAS Number	% wt
Ammonium Hydroxide	1336-21-6	29
De-Ionized Water	7732-18-5	Balance

Occupational Exposure Limits

Ingredient	OSHA PEL	ACGIH TLV		NIOSH REL		NIOSH	
	TWA	STEL	TWA	TWA	STEL	STEL	IDLH
Ammonium Hydroxide	50ppm 35 mg/m ³	25 ppm 17 mg/m ³	35 ppm 24 mg/m ³	25 ppm 18 mg/m ³	35 ppm 27 mg/m ³	25 ppm 18 mg/m ³	300 ppm

Section 3 - Hazards Identification**☆☆☆☆☆ Emergency Overview ☆☆☆☆☆**

Toxic! Corrosive, causes severe burns to eyes, skin, and respiratory tract. Colorless liquid with a strong, suffocating odor.

HMIS**H** 3**F** 1**R** 0**PPE**[†][†]Sec. 8**Potential Health Effects****Primary Entry Routes:** Inhalation, ingestion, eye contact, and skin contact**Target Organs:** Eyes, skin, respiratory system, and gastrointestinal tract**Acute Effects****Inhalation:** Vapor and mists cause burning sensations, cough, sore throat, shortness of breath, and labored breathing.

Inhalation of high concentration of vapor may cause breathing difficulty, tightness in chest, pulmonary edema, and lung damage. Prolonged exposure to highly concentrated vapor atmosphere may lead to narcosis, unconsciousness, coma, and death.

Eye: The concentrate is corrosive to the eyes and is capable of causing severe damage with loss of sight. The vapor is extremely discomforting to the eyes. Repeated or prolonged exposure to irritants may produce conjunctivitis.**Skin:** Corrosive to the skin, causing redness, blisters, burns, and may cause drying of the skin, which may lead to dermatitis.**Ingestion:** Corrosive the gastrointestinal tract and may be fatal if swallowed in quantity. Ingestion may result in sore throat, nausea, abdominal irritation, pain, and vomiting. Large doses of ammonium salts may produce diarrhea and diuresis.

Ammonia poisonings produce flaccidity of facial muscles, tremor, generalized discomfort, and anxiety.

Carcinogenicity: Not listed.**Chronic Effects:** The highly irritant properties of ammonia vapor result as the gas dissolves in mucous fluids and forms irritating and corrosive solutions. Prolonged or repeated skin contact may cause drying with cracking and irritation, with possible dermatitis following.**Section 4 - First Aid Measures****Inhalation:** Remove exposed person to uncontaminated atmosphere and support breathing. If not breathing, give artificial respiration. Seek medical attention immediately.**Eye Contact:** Immediately hold the eyes open and flush continuously for at least 15 minutes with fresh running water. Ensure irrigation under eyelids by occasionally lifting the upper and lower lids. Transport to hospital or doctor without delay.

Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

Skin Contact: Immediately remove all contaminated clothing, including footwear (after rinsing with water). Wash affected areas thoroughly with water (and soap if available). Seek medical attention in event of irritation.

Ingestion: Rinse mouth with plenty of water. Contact a Poison Control Center. Do NOT induce vomiting. Give a glass of water.

After first aid, get appropriate in-plant, paramedic, or community medical support.

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

1. 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.
2. Warm humidified air may soothe bronchial irritation.
3. Test all patients with conjunctival irritation for corneal abrasion (fluorescein stain, slit lamp exam)
4. Dyspneic patients should receive a chest X-ray and test for arterial blood gases to detect pulmonary edema.

Section 5 - Fire-Fighting Measures

Flash Point: Nonflammable

Autoignition Temperature: 651 °C

LEL: 16% v/v

UEL: 25% v/v

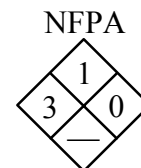
Extinguishing Media: Water spray or fog, dry chemical powder, or appropriate foam.

General Fire Hazards/Hazardous Combustion Products: Noncombustible liquid.

Heating may cause expansion or decomposition leading to violent rupture of containers producing toxic and flammable fumes. May form an explosive mixture with air. Moderate explosion hazard when exposed to flame or involved in fire. Combustion products include nitrogen oxides.

Fire Incompatibility: Avoid contamination with oxidizing agents i.e. nitrates, oxidizing acids, chlorine bleaches, pool chlorine, etc. as ignition may result. The concentrate material forms explosive mixtures with oxygen, chlorine, iodine, mercury, silver, bromine, and hypochlorite.

Fire-Fighting Instructions: Contact fire department and tell them the location and the nature of the hazard. May be violently or explosively reactive. Wear full body protective clothing with breathing apparatus. Prevent spills from entering drains or waterways. Use water delivered as a fine spray to control the fire and cool adjacent area. Avoid spraying water onto liquid pools. Cool fire-exposed containers with water spray from a protected location. If safe to do so, remove containers from path of fire.



Section 6 - Accidental Release Measures

Small Spills: Notify appropriate personnel, isolate area and deny entry. Protected personnel cautiously flush spill with plenty of water. Neutralize spill with soda ash or lime and again flush with water. Small spills can be absorbed with vermiculite or other absorbent, noncombustible material.

Large Spills: Notify appropriate personnel and implement facility emergency response plan. Evacuate nonessential personnel, isolate area, provide maximum ventilation, and remove all heat and ignition sources. Cleanup personnel should wear fully protective equipment for vapor inhalation and skin and eye contact. Dike far ahead of liquid spill, then slowly neutralize or drain into waste treatment system if available. Neutralize surfaces and equipment after spill cleanup. Place clean-up material in appropriate disposal containers and contact licensed disposal contractor.

Regulatory Requirements: Any release to the environment of this product may be subject to federal and/or state reporting requirements. Check with appropriate agencies.

Section 7 - Handling and Storage

Handling Precautions: Handle and open container with care. Avoid all personal contact. Wear protective clothing including gloves, apron, and respirator if needed. Use in a well-ventilated area. Avoid contact with incompatible materials. Keep containers securely sealed when not in use. Avoid physical damage to containers. Always wash hands with soap and water after handling. Observe manufacturer's storing and handling recommendations.

Recommended Storage Methods: Heavy gauge metal packages or heavy gauge metal drums or glass containers. Check that containers are clearly labeled. Packaging as recommended by manufacturer.

Regulatory Requirements: Follow applicable OSHA regulations.

Section 8 - Exposure Controls / Personal Protection

Engineering Controls

Ventilation: Provide general or local exhaust ventilation systems to maintain airborne concentrations below OSHA PELs (Sec. 2). Local exhaust ventilation is preferred because it prevents contaminant dispersion into the work area by controlling it at its source.

Administrative Controls

Respiratory Protection: Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a MSHA/NIOSH-approved respirator. Select respirator based on its suitability to provide adequate worker protection for given working conditions, level of airborne contamination, and presence of sufficient oxygen. For emergency or non-routine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA.

Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres. If respirators are used, OSHA requires a written respiratory protection program that includes at least: medical certification, training, fit testing, periodic environmental monitoring, maintenance, inspection, cleaning, and convenient, sanitary storage areas.

Protective Clothing/Equipment: Wear chemically protective gloves, boots, aprons, and gauntlets to prevent prolonged or repeated skin contact. Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133). Contact lenses are not eye protective devices. Appropriate eye protection must be worn instead of, or in conjunction with contact lenses.

Safety Stations: Make emergency eyewash stations, safety/quick-drench showers, and washing facilities available in work area.

Contaminated Equipment: Separate contaminated work clothes from street clothes. Launder before reuse. Remove this material from your shoes and clean personal protective equipment.

Comments: Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

Section 9 - Physical and Chemical Properties

Physical State: Liquid

Appearance and Odor: Clear, Water-white with strong odor

Vapor Pressure: 66.7 kPa at 27°C

Vapor Density (Air=1): 0.6

Formula Weight: 35.06

Specific Gravity (H₂O=1, at 4 °C): 0.9

pH (1% Solution): 11.7

Water Solubility: Miscible with cold water

Boiling Point: 38°C (°F) at 25%

Freezing/Melting Point: -106°F (-77°C)

Decomposition Temperature (°C): Ambient

% Volatile: 100

Evaporation Rate: Rapid

Section 10 - Stability and Reactivity

Stability: Product is considered stable under normal handling and storage conditions.

Polymerization: Hazardous polymerization will not occur.

Storage Incompatibilities: The concentrate material forms explosive mixtures with oxygen, chlorine, iodine, mercury, silver, bromine and hypochlorite. Do not use aluminum, galvanized iron or zinc, copper, copper alloy, or tin-plated containers. Do not use un-lined steel containers. Avoid storage with oxidizers and strong acids.

Section 11- Toxicological Information*TOXICITY

Oral, human, LD_{Lo}: 43 mg/kg

Oral, rat, LD₅₀: 350 mg/kg

Inhalation, human, LD_{Lo}: 5000ppm

Intravenous, mouse, LD₅₀: 91mg/kg

IRRITATION

Eye, rabbit, irritation: 1 mg/30s rinse - Severe

* See NIOSH, RTECS (BQ9625000), for additional toxicity data.

Section 12 - Ecological Information

Ecotoxicity: LC₅₀ Daphnia magna 0.66 mg/1/48 hr 22 °C; LC₅₀ Perch 0.29 mg/1/7 days/Un-ionized NH₃/; LC₅₀ Salmon gairdnerii 8 ug/mL NH₃/24hr.

Environmental Fate: No data found; no food chain concentration potential; may be harmful to aquatic organisms due the shift in pH.

Section 13 - Disposal Considerations

Disposal: Recycle wherever possible or consult manufacturer for recycling options. Follow applicable federal, state, and local regulations. Treat and neutralize with dilute acid at an effluent treatment plant. Recycle containers; otherwise dispose of in an authorized landfill.

Section 14 - Transport Information

DOT Transportation Data (49 CFR 172.101)

Shipping Name: Ammonia solutions, with 29 percent ammonia

Hazard Class: 8

ID No.: UN2672

Packing Group: III

Label: 8

Special Provisions (172.102): IB3, T7, TP1

Packaging Authorizations

Exceptions: 173.154

Non-bulk Packaging: 173.203

Bulk Packaging: 173.241

Quantity Limitations

Passenger, Aircraft, or Railcar: 5L

Cargo Aircraft Only: 60L

Vessel Stowage Requirements

Vessel Stowage: A

Other: 40, 85

Emergency Response Guidebook #154

Section 15 – Regulatory Information

EPA Regulations:

RCRA Hazardous Waste Number (40 CFR 261.33): Not listed

RCRA Hazardous Waste Classification (40 CFR 261.33): Not classified

CERCLA Hazardous Substance (40 CFR 302.4) listed specific per RCRA, Sec. 3001; 1000 lb (453.5 kg)

SARA 313 (40 CFR 372.65): Not listed

TSCA: Listed

OSHA Regulations:

Air Contaminant (29 CFR 1910.1000, Table Z-1, Z-1-A): Not listed

Section 16 - Other Information

Revision Notes: Revision to Sections 8, 11, 12, 14, and 15.

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