

CORCO CHEMICAL CORPORATION

Manufacturers of ACS Reagents and Semiconductor Grade Chemicals

SAFETY DATA SHEET

AMMONIUM HYDROXIDE (10 - 35%)

1. Identification

Product Identifier: Ammonium Hydroxide (10 - 35%)

Product Code Number: S800

Trade Name: Ammonium hydroxide

Synonyms: Ammonium Hydroxide Solutions, Ammonia Aqueous, Ammonia Solutions

Chemical Formula: NH₄OH in H₂O

Product Use: Process chemical, Laboratory and scientific research and development

Restrictions on use: None known.

Company Identification: Corco Chemical Corporation
299 Cedar Lane
Fairless Hills, PA 19030
Phone: 215-295-5006
Fax: 215-295-0781

24 Hour Emergency Telephone Number:

CHEMTREC (U.S.): 1-800-424-9300

CHEMTREC (Outside U.S.): 1-703-527-3887

SDS Date of Preparation: 11/7/19

2. Hazard(s) identification

Classification of the Substance or Mixture:

Eye Damage Category 1

Skin Corrosion Category 1A

Specific Target Organ Toxicity Single Exposure Category 3 (Irritant)

Label Elements:

Danger!

**Hazard Statements:**

H314 Causes severe skin burns and eye damage.

H335 May cause respiratory irritation.

Precautionary Statements:

P260 Do not breathe mist or vapors.

P264 Wash thoroughly after handling.

P271 Use only outdoors or in a well-ventilated area.

P280 Wear protective gloves, protective clothing, eye protection and face protection.

P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P310 Immediately call POISON CENTER or doctor.

P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.

P310 Immediately call POISON CENTER or doctor.

P363 Wash contaminated clothing before reuse.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do so. Continue rinsing.

P310 Immediately call POISON CENTER or doctor.

P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P310 Immediately call POISON CENTER or doctor.

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

P405 Store locked up.

P501 Dispose of contents and container in accordance with local and national regulations.

Other Hazards: None known

3. Composition/information on ingredients

Ingredient	CAS Number	Percent	Hazardous Chemical
Water	7732-18-5	Balance	No
Ammonium Hydroxide	1336-21-6	10-35%	Yes

The specific identity and/or exact percentage of the composition has been withheld as a trade secret.

4. First-aid measures

Inhalation: Immediately remove victim to fresh air and keep at rest in a position comfortable for breathing. If breathing has stopped, administer artificial respiration. Do not use mouth-to-mouth method if victim inhaled the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Call a physician or poison control center immediately.

Skin contact: Immediately flush skin with plenty of water for 15 minutes while removing contaminated clothing and shoes. Get immediate medical attention. Launder clothing before re-use. (Discard contaminated shoes).

Eye contact: Immediately flush thoroughly with water for at least 30 minutes, while holding the eye lids open to be sure the material is washed out. Remove contact lenses if present and easy to do. Get immediate medical attention.

Ingestion: Do NOT induce vomiting. Rinse mouth with water. Never give anything by mouth to an unconscious or convulsing person. Keep the victim calm and warm. Get immediate medical attention.

Most important symptoms/effects, acute and delayed: Corrosive effects. May cause severe eye, skin, respiratory tract irritation and burns. May cause temporary blindness and severe eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision.

Indication of immediate medical attention and special treatment, if necessary:
Immediate medical attention is required for all routes of exposure.

5. Fire-fighting measures

Suitable (and unsuitable) extinguishing media: Use any means suitable for extinguishing surrounding fire. Water spray may be used to keep fire exposed containers cool.

Specific hazards arising from the chemical: Not considered to be a fire hazard. Irritating, corrosive and/or toxic gases or fumes will be released during a fire. Flammable vapors may accumulate in confined spaces

Special protective equipment and precautions for fire-Fighters: In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full face piece operated in the pressure demand or other positive pressure mode.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures: Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8.

Methods and materials for containment and cleaning up: Contain and recover liquid when possible. Do not let product enter drains. Do not flush caustic residues to the sewer. Residues from spills can be diluted with water, neutralized with dilute acid such as Acetic, Hydrochloric or Sulfuric. Absorb neutralized caustic residue on clay, vermiculite or other inert substance and package in a suitable container for disposal. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

7. Handling and storage

Precautions for safe handling: Do not breathe mist or vapor. Use with adequate ventilation. In case of insufficient ventilation, wear suitable respiratory equipment. Prevent contact with eye, skin, and clothing. Always wear impervious gloves, chemical safety goggles and protective clothing when handling this material. When using, do not eat, drink or smoke. Wash hands thoroughly after handling. Keep containers closed when not in use.

Conditions for safe storage, including any incompatibilities: Store in a cool, dry, well ventilated location out of direct sunlight. Keep container tightly closed. Keep out of the reach of children.

8. Exposure controls/personal protection

Chemical Name	Exposure Limits
Water	None Established
Ammonium Hydroxide (as ammonia)	25 ppm TWA, 35 ppm STEL ACGIH TLV 50 ppm TWA OSHA PEL

Appropriate engineering controls: A system of local and / or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, Industrial Ventilation, A Manual of Recommended Practices, most recent edition, for details.

Personal protective equipment:

Respiratory protection: If the exposure limit is exceeded and engineering controls are not feasible, a full face piece respirator with an ammonia/methylamine cartridge may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full face piece positive-pressure, air-supplied respirator. **WARNING:** Air purifying respirators do not protect workers in Oxygen-deficient atmospheres.

Skin protection: Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. Neoprene and nitrile rubber are recommended materials. Polyvinyl alcohol is not recommended.

Eye protection: Use chemical safety goggles and full face shield where splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and chemical properties

Appearance: Clear, colorless solution

Odor: Ammonia odor

Odor Threshold: Not determined

pH: 13.8 (29% solution)

% Volatiles by volume @ 21°C (70°F): No information found

Melting Point/Freezing Point: -72°C (-98°F)

Boiling Point / Boiling Range: ca. 36°C (ca. 97°F)

Flash Point: Not applicable

Evaporation Rate (BuAc=1): No information found

Flammability (solid, gas): Not applicable

Upper / Lower Flammability or Explosive Limits: Not applicable

Vapor Pressure (mm Hg): 115 @ 20°C (68°F) for 10% solution;
580 @ 20°C (68°F) for 28% solution

Vapor Density (Air=1): 0.60 NH₃

Relative Density: 0.9 g/mL at 25C (77F)

Solubility: Infinitely soluble

Partition Coefficient (n-Octanol/water): No data available

Auto-ignition Temperature: No data available

Decomposition Temperature: No data available

Viscosity: No data available

Other information:

Density: 0.90 g/cm³

Molecular formula: NH₄OH

Molecular weight: 35.05 g/mol

Percent volatile: 100 %

Specific gravity: 0.9

10. Stability and reactivity

Reactivity: Not available.

Chemical stability: Stable at ambient temperatures. Ammonia evaporates from opened containers.

Possibility of hazardous reactions: Hazardous polymerization does not occur.

Conditions to avoid: None under normal conditions.

Incompatible materials: Strong oxidizing agents. Acids. Halogens. Silver salts.

Hazardous decomposition products: Ammonia

11. Toxicological information

Potential Health Effects:

Inhalation: Inhalation of mists or vapors may cause severe irritation and burns of the nose, throat and upper respiratory tract. Higher concentrations can cause burns, pulmonary edema and death.

Skin Contact: Causes severe skin irritation and burns with redness, ulceration, pain, dermatitis, and scarring.

Eye Contact: Vapors cause irritation. Splashes cause severe pain, eye damage, and permanent blindness.

Ingestion: May cause corrosion to the esophagus and stomach with perforation and peritonitis. Symptoms may include pain in the mouth, chest, and abdomen, with coughing, vomiting and collapse. Ingestion of as little as 3-4 mL may be fatal.

Chronic Exposure: Prolonged inhalation may cause lung damage. Repeated exposure may cause damage to the tissues of the mucous membranes, upper respiratory tract, eyes and skin.

Aggravation of Pre-existing Conditions: Persons with pre-existing eye and skin disorders or impaired respiratory function may be more susceptible to the effects of this material.

Carcinogenicity: None of the components of this product are listed as a carcinogen or suspected carcinogen by OSHA, IARC, and NTP.

Reproductive Effects: Reproductive harm is not expected from this product.

Mutagenic Effects: Not expected to cause mutagenic activity.

Acute Toxicity:

Ammonium Hydroxide: Oral rat LD50 – 350 mg/kg, Inhalation rat LC50 – 9.8 mg/L/1 hr (as ammonia)

12. Ecological information

Ecotoxicity:

Product	Species	Test Results
Ammonium Hydroxide	Bluegill	0.024 mg/L 48 Hr LC50
	Fathead minnow	0.75-3.4 mg/L 96 Hr LC50
	Water flea	0.66 mg/L 48 Hr EC50

This product is expected to be very toxic to the aquatic environment. Releases to the environment should be avoided.

Persistence and degradability: Expected to be readily biodegradable.

Bioaccumulative potential: This material is not expected to significantly bioaccumulate.

Mobility in soil: This product is water soluble and will move readily in soil and water.

Other adverse effects: None known.

13. Disposal considerations

Very toxic to aquatic organisms. An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

Hazardous waste code D002: Waste Corrosive material [pH $\leq$ 2 or $\geq$ 12.5, or corrosive to steel]

14. Transportation Information

	UN Number	Proper shipping name	Hazard Class	Packing Group	Environmental Hazard
US DOT	UN2672	Ammonia solutions*	8	III	Not applicable
IMDG	UN2672	Ammonia solutions	8	III	Yes
IATA	UN2672	Ammonia solutions	8	III	Yes

*** Hazardous Substance (49CFR172.101):** Ammonium Hydroxide (RQ 1,000 lbs)- (2,857 lbs. product)

Transport in Bulk According to Annex II of MARPOL 73/78 and the IBC Code: Not applicable

Special Precautions for User: Not applicable

15. Regulatory information

US federal regulations:

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not on regulatory list

CERCLA Hazardous Substance List (40 CFR 302.4)

This product has a Reportable Quantity (RQ) of 2,857 lbs. (based on the RQ for Ammonium Hydroxide of 1,000 lbs present at 10-35%). Releases above the RQ must be reported to the National Response Center. Many states have more stringent release reporting requirements. Report spills required under federal, state and local regulations.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories:

SARA 311/312

Refer to Section 2 for OSHA Hazard Classification.

Section 313 Toxic Chemicals: This product contains the following chemicals subject to SARA Title III Section 313 Reporting requirements:

Ammonium Hydroxide	1336-21-6	10-35%
(Ammonia Solutions)		

SARA 302 Extremely hazardous substance

None

Other federal regulations:

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

AMMONIA (CAS 7664-41-7)

Safe Drinking Water Act (SDWA)

Not regulated

Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR

1310.02(b) and 1310.04(f) (2) and Chemical Code Number

Not listed

Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21 CFR 1310.12(c))

Not regulated

DEA Exempt Chemical Mixtures Code Number

Not regulated

Food and Drug Administration (FDA)

Not regulated.

US state regulations California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This product does not contain chemicals known in the State of California to cause cancer and/or reproductive harm.

S. Massachusetts RTK - Substance List

AMMONIA (CAS 7664-41-7)

US. New Jersey Worker and Community Right-to-Know Act

AMMONIA (CAS 7664-41-7) 500 LBS

US. Pennsylvania RTK - Hazardous Substances

AMMONIA (CAS 7664-41-7)

US. Rhode Island RTK

AMMONIA (CAS 7664-41-7)

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance:

Not listed

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s)

16. Other information

Date of Current Revision: 11/7/19

Revision Summary: Updated all sections.

Date of Previous Revision: N/A

Disclaimer - The information in the SDS is based on the data available at the time. While believed to be accurate, Corco does not claim it to be all inclusive. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. It is not intended to provide product performance or applicability information, and no express or implied warranty of any kind is made with respect to the product, the underlying product data, or the information contained herein. We will not provide advice on such matters, or be responsible for any injury or damage resulting from the use of the product described herein.