

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

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)

Trade Name:

Ammonium hydroxide

Synonyms:

Ammonium Hydroxide Solutions,
Ammonia Aqueous, Ammonia Solutions
NH₄OH in H₂O

Chemical Formula:

Product Use:

Process chemical, Laboratory and
scientific research and development

2. HAZARD(S) IDENTIFICATION

Classification of the Substance or Mixture:

Acute toxicity, Oral

Category 4

Skin corrosion

Category 1A

Serious eye damage

Category 1

Acute aquatic toxicity

Category 1

Sensitization, respiratory

Category 1

Specific target organ toxicity, single exposure

Category 3 respiratory tract
irritation

OSHA hazard(s)

Not classified



Signal word **Danger**

Hazard statement: Harmful if swallowed. Causes severe skin burns and eye damage. Causes serious eye damage. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause respiratory irritation. Harmful to aquatic life. Harmful to aquatic life with long lasting effects.

Precautionary statement: Prevention Use only outdoors or in a well-ventilated area. Do not breathe mist or vapor. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Wear protective gloves/protective clothing/eye protection/face protection. In case of inadequate ventilation wear respiratory protection.

Response: IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. If swallowed, Rinse mouth. Do NOT induce vomiting. If on skin (or hair) Take off immediately all contaminated clothing. Rinse skin with water shower. If inhaled, Remove person to fresh air and keep comfortable for breathing. If in eyes, Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Storage: Store in a well-ventilated place. Keep container tightly closed. Store locked up.

Disposal: Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

3. Composition/information on ingredients

CAS Number: 7664-41-7
EC Number: 231-635-3
Index Number: 007-001-01-2
Molecular Weight: 35.05 g/mol

<u>Ingredient</u>	<u>CAS No.</u>	<u>EC Number</u>	<u>Percent</u>	<u>Hazardous Chemical Characterization</u>
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Ammonia	7664-41-7	231-635-3	21 - 72%	Yes	Substance
Water	7732-18-5	231-791-2	28 - 79%	No	Mixture

*Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. First-aid measures

Inhalation: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Oxygen or artificial respiration if needed. 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: Take off immediately all contaminated clothing. Rinse skin with water/shower. Call a physician or poison control center immediately. For minor skin contact, avoid spreading material on unaffected skin.

Eye contact: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a physician or poison control center immediately.

Ingestion: DO NOT INDUCE VOMITING! Give large quantities of water. Never give anything by mouth to an unconscious person.

Most important symptoms/effects, acute and delayed: Corrosive effects. Irritation of eyes and mucous membranes. May cause temporary blindness and severe eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. May cause allergic respiratory reaction.

5. Fire-fighting measures

Fire: Not considered to be a fire hazard. At fire temperatures, Fire may produce irritating, corrosive and / or toxic gases.

Explosion: Flammable vapors may accumulate in confined spaces.

Fire Extinguishing Media: Use any means suitable for extinguishing surrounding fire. Water spray may be used to keep fire exposed containers cool. Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Special Information: 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.

Specific hazards arising from the chemical: Irritating, corrosive and/or toxic gases or fumes will be released during a fire.

6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures: Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area. Material should not be released into the environment. This product is miscible in water.

Environmental Precautions and 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: In case of insufficient ventilation, wear suitable respiratory equipment. Do not breathe mist or vapor. Do not get this material in contact with eyes. Do not get this material in contact with skin. Do not taste or swallow. Do not get this material on clothing. Avoid prolonged exposure. When using, do not eat, drink or smoke. Wash hands thoroughly after handling. Avoid release to the environment. Do not empty into drains. Conditions for safe storage, including any incompatibilities.

Storage: Store locked up. Store in a well-ventilated place. Keep container tightly closed. Keep out of the reach of children. Store in a cool, dry place out of direct sunlight.

8. Exposure controls/personal protection

Airborne Exposure Limits: OSHA Permissible Exposure Limit (PEL): 50 ppm (NH₃)

ACGIH Threshold Limit Value (TLV): 25 ppm (NH₃) (TWA) 35 ppm (STEL)

Ventilation System: 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 Respirators (NIOSH Approved): 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 / or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

General Considerations: When using, do not eat, drink or smoke. Do not get in eyes. Do not get this material in contact with skin. Do not get this material on clothing. Wash hands before breaks and immediately after handling the product. Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Appearance:	Clear, colorless solution
Odor:	Ammonia odor
Odor Threshold:	Not determined
pH:	13.8 (29% solution)
% Volatiles by volume @ 21C (70F):	No information found
Melting Point:	-72C (-98F)
Boiling Point / Boiling Range:	ca. 36C (ca. 97F)
Flash Point:	Not applicable
Evaporation Rate (BuAc=1):	No information found
Flammability:	Not applicable
Upper / Lower Flammability or Explosive Limits:	Not applicable
Vapor Pressure (mm Hg):	115 @ 20C (68F) for 10% solution; 580 @ 20C (68F) 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

Emergency Overview: POISON! DANGER! CORROSIVE. MAY BE FATAL IF SWALLOWED OR INHALED. MIST AND VAPOR CAUSE BURNS TO EVERY AREA OF CONTACT.

Potential Health Effects:

Inhalation: Vapors and mists cause irritation to the respiratory tract. Higher concentrations can cause burns, pulmonary edema and death. Brief exposure to 5000 ppm can be fatal.

Ingestion: Toxic! 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.

Skin Contact: Causes irritation and burns to the skin.

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

Chronic Exposure: 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 disorders or impaired respiratory function may be more susceptible to the effects of this material.

Specific Target Organ Toxicity - Single Exposure (Globally Harmonized System):
No data available.

Specific Target Organ Toxicity - Repeated Exposure (Globally Harmonized System):
No data available.

Numerical Measures of Toxicity: Cancer Lists: NTP Carcinogen

Ingredient	Known	Anticipated	IARC Category
Ammonium Hydroxide (1336-21-6)	No	No	None
Water (7732-18-5)	No	No	None

Acute Toxicity:

For Ammonium Hydroxide: Oral rat LD50: 350 mg/kg; eye, rabbit, standard Draize, 250 ug; severe Investigated as a mutagen.

For Ammonia: Inhalation rat LC50: 2000 ppm/4-hr Investigated as a tumorigen, mutagen.

12. Ecological information

Ecotoxicity: Harmful to aquatic life with long lasting effects. Components of this product are hazardous to aquatic life. Accumulation in aquatic organisms is expected.

Product	Species	Test Results
AMMONIUM HYDROXIDE CAS Mixture)	rainbow trout	0.008 mg/L 24 Hr LC50
	Bluegill	0.024 mg/L 48 Hr LC50
	fathead minnow	8.2 mg/L 96 Hr LC50
	water flea	0.66 mg/L

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: 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.

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 ≤ 2 or ≥ 12.5 , or corrosive to steel]

14. Transportation Information

UN Number: UN2672

UN Proper Shipping Name: AMMONIA SOLUTIONS (WITH 10-35% AMMONIA)

Packing Group: III

DOT / IMDG / IATA



Land Transport ADR/RID and GGVS/GGVE (Cross Border / Domestic)
Transport Hazard Class(es): 8

Maritime Transport IMDG/GGVSea
Transport Hazard Class(es): 8

Marine Pollutant: No

Air Transport ICAO-TI and IATA-DGR
Transport Hazard Class(es): 8

Transport in Bulk According to Annex II of MARPOL 73/78 and the IBC Code

Special Precautions for User: Warning: Corrosive Substances

15. Regulatory information

US federal regulations: All components are on the U.S. EPA TSCA Inventory List.
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)

Ammonia CAS 7664-41-7 LISTED

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories:

Immediate Hazard - Yes

Delayed Hazard - Yes

Fire Hazard - No

Pressure Hazard - No

Reactivity Hazard - No

SARA 302 Extremely hazardous substance

No

SARA 311/312 Hazardous chemical

No

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 material is not known to contain any chemicals currently listed as as carcinogens or reproductive toxins.

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
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
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

Disclaimer - The information in the sheet was written based on the best knowledge and experience currently available. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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