

Material Safety Data Sheet

AMMONIA SOLUTION

Print Date: July 2008

SECTION 1 – Chemical Product and Company Identification

MSDS Name: AMMONIA SOLUTION

MSDS Preparation Date: 07-2008, Supersedes 02-2007, 02-2004, 02-2001 & 02-98

Synonyms or Generic ID: Ammonium hydrate, ammonium hydroxide, ammonia water, aqueous ammonia, ammonia, aqueous.

Seastar Product Codes: S010701, S020701, S010701-SSNH04, S010701-SSEH04, S010701-SSNH05, S010701-SSEH05, S010701-SSNH06, S010701-SSEH06, S010701-SSNH11, S010701-SSEH11, S010701-SSNH43, S010701-SSEH43, S010701-SSNH61, S010701-SSEH61, S010701-SSNH63, S010701-SSEH63, S020701-SSNJ01, S020701-SSEJ01, S020701-SSNJ02, S020701-SSEJ02, S020701-SSNJ03, S020701-SSEJ03, S020701-SSNJ04, S020701-SSEJ04, S020701-SSNJ05, S020701-SSEJ05, S020701-SSNJ06, S020701-SSEJ06, S050702-SSNH63, S050702-SSEH63, S050701-SSNH64, S050701-SSEH64, IQ-07-0500, IQ-07-4000, BA-07-0250, BA-07-0500, BA-07-1000

Canadian TDG Classification: 8 PKG Gr III

PIN (UN# / NA#): UN2672

Formula: NH₃ solution (NH₄OH, Ammonium Hydroxide)

Molecular Wt: NH₃ solution: 17.03g/mol

Molecular Wt: NH₄OH, Ammonium Hydroxide: 35.05g/mol

Canadian WHMIS Class: Class E; Class D Div 1 Sub B.

Supplier: Seastar Chemicals Inc, 10005 McDonald Park Road, Sidney, BC V8L 5Y2 CANADA

Tel: (250) 655-5880, **Fax:** (250) 655-5888

CANUTEC (CAN): (613)-996-6666

SECTION 2 – Composition/Information on Ingredients

CAS #	Chemical Name	Percent	EINECS/ELINCS	TLV	Hazard
1336-21-6 (Ammonia 7664-41-7)	Ammonia Solution (Ammonium Hydroxide)	20-22% (as NH ₃)	215-647-6	(TWA) 25 ppm (18 mg/m ³) (ACGIH) STEL 35 ppm (27 mg/m ³) (ACGIH)	Corrosive/Poison
7732-18-5	Water	Balance		None	None

Hazard Symbols: C & D Div 1

Risk Phrases: 34

SECTION 3 – Hazards Identification

EMERGENCY OVERVIEW

Appearance: Colourless to milky coloured liquid with a strong pungent odour of ammonia gas. Will not burn under normal conditions. However, ammonia gas may be generated from ammonium hydroxide solutions. High airborne concentrations of ammonia can be ignited and pose a significant fire and explosion hazard, especially in a confined space. Ammonia gas can decompose at high temperatures forming very flammable hydrogen and toxic nitrogen dioxide. May be a confined space explosion and toxicity hazard. TOXIC. Harmful if inhaled or swallowed. Causes lung injury--effects may be delayed. CORROSIVE to the eyes, skin and respiratory tract. Can cause permanent eye injury or blindness, and permanent scarring of the skin.

Potential Health Effects

Primary Route(s) of Entry: Inhalation and ingestion. Skin contact. Eye contact.

Effects of Acute Exposure: May be fatal by ingestion or skin absorption. CORROSIVE!

LDLO: Inhalation-human 5000 ppm. 2500-6500 ppm is dangerous for as little as 30 minutes.

LD50/LC50: CAS# 1336-21-6 (Ammonia Solution 7664-41-7): Oral, rat: LD50 – 350 mg/kg.

Eyes: Immediate intense irritation and pain. Ulceration of the conjunctiva and cornea, iritis, cataract, glaucoma. Causes severe burns and loss of vision. May cause permanent damage. **IRRITATION: EYES – RABBIT** 44 µg severe. Contact with liquid or vapor causes severe burns and possible irreversible eye damage.

Skin: Causes severe burns. Blister formation and vesiculation. May be fatal. Causes severe skin irritation. Causes skin burns. May cause deep penetrating ulcers of the skin. Skin contact can cause brown stains in the area and possible hardening of the outer skin layer.

Ingestion: Burns in mouth, pharynx and gastrointestinal tract. Gastritis, coughing, vomiting, possibility of oesophageal and gastric perforations, of lung irritation and of pulmonary oedema after a delay. Possible death from shock or asphyxia may result. As little as one teaspoonful (5 mL) of 28% NH₄OH solution has been recorded as fatal. **LDLo: ORAN-HUMAN** 43 mg/kg. Harmful if swallowed. May cause

severe and permanent damage to the digestive tract. Causes gastrointestinal tract burns. Causes throat restriction, vomiting, convulsions and shock.

Inhalation: Causes severe respiratory tract inflammation. Destructive to tissues of mucous membranes. Coughing, dyspnea, bronchospasm. Chest pain, laryngeal oedema, possible suffocation, pulmonary oedema, and possibly death. Some symptoms may be delayed and/or accompanied by pink frothy sputum. Effects may be delayed. Causes severe irritation of the upper respiratory tract with coughing, burns, breathing difficulty, and possible coma.

Effects of Chronic Exposure: Irritation: eyes, respiratory tract. Chronic bronchitis and dermatitis. Olfactory fatigue (the odour and irritation effects are detected at higher concentrations). To the best of our knowledge, the chronic toxicity of this substance has not been fully investigated. Chronic ingestion may cause effects similar to those of acute ingestion. Prolonged or repeated exposure may cause corneal damage and the development of cataracts and glaucoma.

SECTION 4 – First Aid Measures

Eyes: Immediately flush eyes with large amounts of water for at least 15 minutes, holding lids apart to ensure flushing of the entire surface. Get medical aid immediately.

Skin: Get medical aid immediately. Immediately flush skin with copious quantities of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. Wash clothing before re-use.

Ingestion: Do NOT induce vomiting. Call a physician. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Possible aspiration hazard. Get medical aid immediately.

Inhalation: Remove patient to fresh air. Administer approved oxygen supply if breathing is difficult. Administer artificial respiration or CPR if breathing has ceased. Call a physician.

Get medical aid immediately.

Notes to Physician: After inhalation exposure, observe for 24 to 72 hours as pulmonary edema may be delayed.

SECTION 5 – Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Ammonium hydroxide will not burn. If ammonia gas is burning, use dry chemical powder or carbon dioxide for small fires and water spray, fog or foam for large fires. Otherwise, use extinguishing media appropriate to the surrounding fire conditions.

Auto-ignition Temperature: 651 deg C (1204 deg F) (ammonia gas)

Flash Point: Not flammable under normal conditions.

NFPA Rating: Not published.

Explosion Limits: Lower: Not available for solutions. 15.5-16% (ammonia gas) Upper: Not available for solutions. 25-27% (ammonia gas)

SECTION 6 – Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g., dry sand or earth), then place into as chemical waste container. Neutralize spill with a weak acid such as vinegar or acetic acid.

Steps to be taken in case material is released or spilled: Evacuate and ventilate the area. Wear self-contained breathing apparatus, rubber boots and heavy rubber gloves. Shut off all sources of ignition. Dilute with a large volume of water. Place in a suitable container and mark for disposal. Wash spill site after material pick-up is complete.

Waste disposal method: According to all applicable regulations. Avoid run-off.

SECTION 7 – Handling and Storage

Handling: Wash thoroughly after handling. Use only in a well-ventilated area. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale.

Storage: Store in a cool place away from heated areas, sparks and flame. Store in a cool, dry area. Store in a well-ventilated area. Do not store in direct sunlight. Store away from incompatible materials. Keep tightly closed. Empty container may contain hazardous residue. Do not add any other material to the container. Do not wash down the drain. Do not get in eyes, on skin or on clothing. Wash well after use. Use in accordance with good storage and handling practices. Do not allow smoking or food consumption while handling.

Storage Code: White.

SECTION 8 – Exposure Control/Personal Protection

Engineering Controls: Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits:

<i>Chemical Name</i>	<i>ACGH</i>	<i>NIOSH</i>	<i>OSHA</i>
Ammonium hydroxide	None listed.	None listed.	None listed.

OSHA Vacated PELs

Personal Protective Equipment

Eyes: Wear safety glasses with side shields. Face shield. Safety goggles.

Skin: Wear appropriate protective neoprene or butyl rubber gloves to prevent skin exposure. Rubber apron, boots and full protective clothing.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respiratory Protection: Follow the OSHA respirator regulations found in 29CFR 1910.134. Always use a NIOSH-approved respirator when necessary. Wear appropriate OSHA/MSHA approved chemical cartridge respirator. If more than TLV, do not breathe vapour. Wear self-contained breathing apparatus.

Ventilation: Use only in a chemical fume hood. Adequate ventilation to maintain vapour/dust below TLV.

Other Protective Equipment: Make eye bath and emergency shower available.

SECTION 9 – Physical and Chemical Properties

Unless otherwise specified, all w/w percents are expressed in terms of Mass NH₄OH (Ammonium Hydroxide) / Mass Solution

Physical State: Liquid

Appearance: colourless

Odour: strong odour – ammonia-like

pH: 10.6 (0.01 N); 11.1 (0.1 N); 11.6 (1 N)

Vapour Pressure: 10% (w/w): ~15 kPa (~112.5 mm Hg) @20 °C; 19.1% (w/w): 29.5 kPa (221.4 mm Hg); 28.8% (w/w): 74.2 kPa (556.7 mm Hg) both @21.1 °C

Vapour Density: Not available

Evaporation Rate: Not available

Viscosity: No information available.

Boiling Point: 29.4% (w/w): 27.2 °C (81 °F)

Freezing/Melting Point: -Not available. Concentrations not specified: (-72.4 °C (-98.3 °F); -77 °C (-107 °F)

Decomposition Temperature: No information available.

Solubility: Soluble in all proportions in water.

Specific Gravity/Density: 10% (w/w): 0.96; 20% (w/w): 0.925 @20 °C; 30% (w/w): 0.895 @15 °C (water = 1)

Molecular Formula: NH₄OH, (NH₃ (aq) Solution)

Molecular Weight: 35.0411 (17.0304, NH₃ (aq) Solution)

SECTION 10 – Stability and Reactivity

Chemical Stability: Stable. Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: High temperatures, incompatible materials.

Incompatibilities with Other Materials: Oxidizers, halogens, acids (hydrochloric, hydrofluoric, nitric, sulphuric), acrolein, acrylic acid, dimethyl sulphate, gold, silver nitrate, silver oxide, silver oxide plus ethyl alcohol, hypochlorites, mercury, propylene oxide, iodine, nitromethane, iron, 1,2-dichloroethane, gold salts, sodium hydroxide. Attacks some metals such as copper, tin, zinc, aluminium, silver and their alloys. Interhalogens, metal halides, ethylene oxide, chlorosulphonic acid. Acrylein, acrylic acid, chlorosulfonic acid, dimethyl sulfate, fluorine, gold + aqua regia, hydrochloric acid, hydrofluoric acid, iodine, nitric acid, oleum, propiolactone, propylene oxide, silver nitrate, silver oxide, silver oxide + ethyl alcohol, nitromethane, silver permanganate, sulfuric acid, halogens. Forms explosive compounds with many heavy metals and halide salts.

Hazardous Decomposition Products: Nitric oxide (Box) and ammonia (NH₃) fumes.

Hazardous Polymerization: Will not occur.

SECTION 11 – Toxicological Information

RTECS: CAS# 1336-21-6: BQ9625000.

LD50/LC50: CAS# 13336-21-6: Oral, rat: LD50 = 350 mg/kg.

Carcinogenicity: CAS# 1336-21-6: Not listed as a carcinogen by ACGIH, IARC, NIOSH, NTP, OSHA, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive: No information available.

Mutagenicity: Microbial mutation w/o S9: E. coli., 10 mg/disc.

Neurotoxicity: No information available.

SECTION 12 – Ecological Information

Ecotoxicity: No information available.

Bluegill LC50=0.024 to 0.093 mg/L/48H Goldfish TLm=2.0 to 2.5 mg/L/24-96H.

Environmental: No information reported.

Physical: No information available

Other: None.

SECTION 13 – Disposal Considerations

Dispose of in a manner consistent with federal, provincial/state/territorial, and local regulations.

RCRA D-Maximum Concentration of Contaminants: None of the components are on this list.

RCRA D Series – Chronic Toxicity Reference Levels: None of the components are on this list.

RCRA F Series Wastes: None of the components are on this list.

RCRA P Series Wastes: None of the components are on this list.

RCRA U Series Wastes: None of the components are on this list.

RCRA Substances Banned from Land Disposal: None of the components are on this list.

SECTION 14 – Transport Information

Proper Shipping Name: AMMONIA SOLUTION, relative density between 0.880 and 0.957 at 15 degrees C in water, with more than 10 per cent but not more than 35 percent ammonia

Hazard Class: 8

UN Number: UN2672

Packing Group: III

SECTION 15 – Regulatory Information

US Federal

TSCA: CAS# 1336-21-6 is listed on the TSCA Inventory.

Health and Safety Reporting List: None of the components are on this list.

Chemical Test Rules: None of the components are on this list.

TSCA Section 12b: None of the components are on this list.

TSCA Significant New Use Rule (SNUR): None of the components are on this list.

CERCLA Reportable Quantities (RQ): CAS# 1336-21-6: final RQ = 1000 pounds (454 kg).

SARA Threshold Planning Quantities (TPQ): None of the components are on this list.

SARA Hazard Categories: CAS# 1336-21-6: acute, chronic.

SARA Section 313: This material contains Ammonium hydroxide (CAS# 1336-21-6, 28.0-30%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

US State

State Right to Know: Ammonium hydroxide can be found on the following state Right-to-Know lists: California, New Jersey, Pennsylvania, Massachusetts.

California Prop 65: No information available.

California No Significant Risk Level: No information available.

European/International Regulations

European Labelling in Accordance with EC Directives:

Hazard Symbols:

Risk Phrases:

Safety Phrases: S 24/25 Avoid contact with skin and eyes.

Clean Air Act – Hazardous Air Pollutants (HAPs): None of the components are on this list.

Clean Air Act – Class 1 Ozone Depleters: None of the components are on this list.

Clean Air Act – Class 2 Ozone Depleters: None of the components are on this list.

Clean Water Act – Hazardous Substances: CAS# 1336-21-6 is listed as a Hazardous Substance under the CWA.

Clean Water Act – Priority Pollutants: None of the components are on this list.

Clean Water Act – Toxic Pollutants: None of the components are on this list.

OSHA – Highly Hazardous: None of the components are on this list.

WGKK (Water Danger/Protection): No information available.

Canadian DSL/NDSL: CAS# 1336-21-6 is listed on Canada's DSL/NDSL List.

Canadian WHMIS Classification: This product has a WHMIS classification of D1B, E.

Canada Ingredient Disclosure List: CAS# 1336-21-6 is listed on Canada's Ingredient Disclosure List.

Exposure Limits: Not listed.

OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

OES-United Kingdom: TWA 10 ppm TWA; 25 mg/m³ TWA

OES-United Kingdom: STEL 15 ppm STEL; 37 mg/m³ STEL

SECTION 16 – Other Information

The statements contained herein are offered for informational purposes only and are based upon technical data. Seastar Chemicals Inc believes them to be accurate but does not purport to be all-inclusive. The above-stated product is intended for use only by persons having the necessary technical skills and facilities for handling the product at their discretion and risk. Since conditions and manner of use are outside our control, we (Seastar Chemicals Inc) make no warranty of merchantability or any such warranty, express or implied with respect to information and we assume no liability resulting from the above product or its use. Users should make their own investigations to determine suitability of information and product for their particular purposes.