Aqua Ammonia: Product Identification

Trade Name: Aqua Ammonia
Synonyms: Ammonia Solutions; Ammonium Hydroxide; High Strength Aqua Ammonia (30% NH₃); Regular Strength Aqua Ammonia (25% NH₃)
Chemical Family: Caustic Solution
Chemical I.D. No.: UN2672; STCC # 4935280
Chemical Formula: H₃NO
DOT Hazard Class: 8
Label Required: RQ

Aqua Ammonia: Composition

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>CAS #</th>
<th>Wt%</th>
<th>OSHA PEL¹</th>
<th>ACGIH STEL²</th>
<th>NIOSH IDLH³</th>
<th>ACGIH TLV⁴</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonia</td>
<td>7664-41-7</td>
<td>10.0 – 35.0</td>
<td>50</td>
<td>35</td>
<td>300</td>
<td>25</td>
<td>ppm</td>
</tr>
<tr>
<td>Water</td>
<td>7732-18-5</td>
<td>65.0 – 90.0</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>ppm</td>
</tr>
</tbody>
</table>

1 = Permissible Exposure Limit (8-Hr. Time Weighted Average).
2 = Short Term Exposure Limit (15 Minute Exposure).
3 = Immediately Dangerous to Life and Health.
4 = Threshold Limit Value (8-Hr. Time Weighted Average).
N.A. = Not Available

Aqua Ammonia: NFPA Code

2 Health Hazard (Blue):
0 Flammability Hazard (Red):
   Will not burn.
0 Reactivity Hazard (Yellow):
   Normally stable. Not reactive with water.
NONE Special Notice (White):
   None listed.
**Aqua Ammonia: Physical and Chemical Properties**

- **Boiling Point:** 80 – 120°F (27 – 49°C)
- **Vapor Pressure:** 4.5 - 11.0 psia @ 68°F (20°C)
- **Solubility in \( H_2O \):** infinitely soluble
- **Specific Gravity:** 7.45 – 7.75 lb/gal @ 68°F (20°C) (0.89 – 0.93 g/cc)
- **Vapor Density:** 0.6 (air = 1.0) (value for gaseous Ammonia)
- **pH:** >13.7
- **Odor:** Extremely irritating (the human detection limit of \( NH_3 \) is 5 – 50 ppm)
- **Appearance:** Colorless liquid

**Aqua Ammonia: Fire and Explosion Data**

Aqua Ammonia is an aqueous solution that will not support combustion.

**Special Fire Fighting Procedure:**

Aqua Ammonia will decompose to Gaseous Ammonia when exposed to heat. Use water spray or fog to keep fire-exposed containers cool. Ammonia burns to form oxides of nitrogen. Firefighters should wear self-contained breathing apparatus and full protective clothing.

**Gaseous Ammonia:**

- **Flash Point:** Not flammable under conditions typically encountered.
- **Flammable Limits in Air %/Vol.:** Lower: 16.0%, Upper: 25.0%
- **Autoignition Temperature:** 1,204°F (651°C)
- **Extinguishing Media:** Water fog is best. (Ammonia will react with Carbon Dioxide to form a dense white cloud).

**Unusual Fire or Explosion Data:**

If exposed to elevated temperatures, Aqua Ammonia will release Ammonia gas. Although classified nonflammable, Ammonia does have an explosive range. Ammonia can be a dangerous fire and explosion hazard when mixed with air.

**Aqua Ammonia: Reactivity Data**

- **Stability:** Stable
- **Hazardous Polymerization:** Will not occur.

**Conditions to avoid /Incompatibility:**

Heat, acids, strong oxidizing agents, chlorine, bromine, pentafluoride, nitrogen trifluoride, mercury, silver oxide, calcium, and chlorides of iron. Do not use copper, brass, bronze, or galvanized steel in Aqua Ammonia service.

**Hazardous Decomposition Products:**

Ammonia and oxides of Nitrogen (Nitrogen Dioxide, Nitric Oxide).
Aqua Ammonia: Health Hazard Data

Carcinogenicity: NO
IARC Monographs: NO
OSHA Regulated: NO

Occupational Exposure Limits:

OSHA Permissible Exposure Limit (PEL): 50 ppm of Ammonia gas, 8 hour Time Weighted Average.
ACGIH Short-term Exposure Limit (STEL): 35 ppm of Ammonia gas, 15 minutes Short Term Exposure Limit.
NIOSH Immediately Dangerous to Life and Health (IDLH): 300 ppm of Ammonia gas is immediately dangerous.
ACGIH Threshold Limit Value (TLV-TWA): 25 ppm of Ammonia gas, 8 hour Time Weighted Average.

Acute Effects of Overexposure:

Eyes: Contact may cause corrosion, pain, redness, and ulceration of the cornea, lens and conjunctiva.
Skin: Substance is corrosive, contact can cause chemical burns resulting in severe dermal damage.
Inhalation: The gas is extremely irritating to mucous membranes and lung tissue. Coughing, chest pain, and difficulty in breathing may result. Prolonged exposure may result in bronchitis, pulmonary edema, and chemical pneumonitis. Breathing high concentrations may result in death.
Ingestion: Extremely irritating to mucous membranes causing vomiting, nausea and burns.

Chronic Effects of Overexposure:

No chronic health effects have been found to date.

Additional Medical and Toxicological Information:

May aggravate preexisting pulmonary, lung, or eye conditions.

Aqua Ammonia: Emergency First Aid Procedures

Eye contact: Immediately flush with large amounts of water, including under the eyelids. Seek medical attention immediately, preferably an Ophthalmologist. Speed and thoroughness in rinsing eyes are important to avoid permanent injury.
Skin Contact: Immediately flush with large amounts of tepid water while removing contaminated clothing and shoes. Get medical attention.
Inhalation: Remove promptly to fresh air. If breathing has stopped, apply artificial respiration. Apply oxygen as soon as possible. Seek medical attention immediately.
Ingestion: Do not induce vomiting. Rinse mouth out with water. Drink large amounts of water or milk. Seek medical attention immediately.
Aqua Ammonia: Special Protection Information

Eye Protection: Aqua Ammonia is severely corrosive to mucosal membranes (eyes, nose, throat). Remove contact lenses and wear chemical goggles. A face shield is also advised for additional skin protection where contact with liquid or vapor may occur.

Skin Protection: Aqua Ammonia is severely corrosive to epidermal tissue. Wearing nonporous clothing: pants, sleeves, footwear, and gloves is the recommended protection against skin contact.

Inhalation: Use approved full-face respiratory protective equipment when concentrations of gaseous ammonia are greater than STEL. SCBA is required to contain a liquid leak, upon entry into buildings and entry into designated confined space areas, or in any situations where airborne concentrations may exceed occupational exposure limits.

Ventilation: Provide adequate general and local exhaust ventilation to attain occupational exposure limits, to prevent the formation of explosive atmospheres; and to prevent the formation of an oxygen deficient atmosphere, particularly in a confined space area.

Aqua Ammonia: Spill or Leak


Aqua Ammonia: Waste Disposal

Procedure: Aqua Ammonia is an immediate poison to marine life. Vegetation, insects, reptiles, fish and small mammals contacted by Aqua Ammonia (or a large gaseous Ammonia vapor clouds released by heat) will likely die; post spill conservation measures may be required. Minimize runoff to watersheds by diking, containment or absorption. Contaminated dirt may be spread as a fertilizer.

Aqua Ammonia: Special Precautions and Comments

Storage Precautions: Store cylinders and tanks in a well ventilated area, away from incompatible materials (i.e. Chlorine), sources of heat and ignition. Empty containers may contain residual gas and can be dangerous. Ground or bond all lines and equipment used for the transfer and storage of ammonia gas to prevent static sparks. Do not pressurize, cut, weld, braze, solder, drill, grind or expose such containers to heat, flames, sparks or other sources of ignition; they may explode and cause injury or death.
Aqua Ammonia: EPA SARA Title III Information

EPCRA Section 311/312 Hazard Categorization:

<table>
<thead>
<tr>
<th></th>
<th>Acute</th>
<th>Chronic</th>
<th>Fire</th>
<th>Pressure</th>
<th>Reactive</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

EPCRA & CAA Hazardous Substances:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>% / wt.</th>
<th>CAA 112(r)</th>
<th>302 TPQ lb.</th>
<th>304 RQ lb.</th>
<th>313 TRI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium Hydroxide</td>
<td>1336-21-6</td>
<td>For &lt;20%</td>
<td>Not listed</td>
<td>Not listed</td>
<td>1,000</td>
<td></td>
</tr>
<tr>
<td>Ammonium ion in Water</td>
<td>7664-41-7</td>
<td>For &gt;20%</td>
<td>20,000</td>
<td>500</td>
<td>100</td>
<td>X</td>
</tr>
</tbody>
</table>

Key:  
CAA 112(r) = Toxic Substance with potential for airborne release  
Sec. 302 TPQ = Extremely Hazardous Substances (EHS) Threshold Planning Quantity  
Sec. 304 RQ = EHS and CERCLA Reportable Quantity if spilled  
Sec. 313 TRI = Toxic Chemicals to be reported on Toxic Release Inventory if spilled

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