

## Material Safety Data Sheet

### Ammonia solution

#### Section 1 – PRODUCT AND COMPANY IDENTIFICATION

<b>1. Product Identifier</b>	Ammonia solution; Ammonium hydroxide; Ammonia aqueous
<b>2. Recommended Use &amp; Uses advised against</b>	Uses for Laboratory and R&D, Industrial, Food additives only
<b>3. Information of Supplier</b>	SAMCHUN PURE CHEMICAL CO.,LTD ADDRESS; (Mogok-dong) 117, Sandan-ro 16Beon-gil, Pyeongtaek-si, Gyeonggi-do, Korea Emergency Phone; 82-31-668-0700/3 Department; Safety & Environment dep. Web site; <a href="http://www.samchun.com">http://www.samchun.com</a>

#### Section 2 – HAZARDS and DANGER IDENTIFICATION

<b>1.GHS Classification· Identification</b>	Acute toxic(Oral)	Category4
	Skin Corrosion/Skin Irritation	Category1
	Serious Eye Damage/Eye Irritation	Category1
	Specific Target Organ Toxicity (Single Exposure)	Category1
	Specific Target Organ Toxicity (Repeated Exposure)	Category2
	Acute Aquatic Toxicity	Category1
	Chronic Aquatic Toxicity	Category1
	Metal corrosive substance	Category1

#### 2. Label and Mark including Precautionary Statement

◦Label elements



◦Signal word

Danger

◦Hazard · Danger statement

H290 May be corrosive to metals  
H302 Harmful if swallowed  
H314 Causes severe skin burns and eye damage  
H318 Causes serious eye damage  
H370 Causes damage to organs (Respiratory tract, lung)  
H373 May cause damage to organs (Respiratory, lung, eyes) through prolonged or repeated exposure  
H400 Very toxic to aquatic life  
H410 Very toxic to aquatic life with long lasting effects

◦Precautionary statement

**Precaution** P234 Keep only in original container  
P264 Wash ... thoroughly after handling.  
P270 Do not eat, drink or smoke when using this product.  
P260 Do not breathe dust/fume/gas/mist/vapours/spray.  
P280 Wear protective gloves/protective clothing/eye protection/face protection  
P273 Avoid release to the environment

<b>Measures</b>	<p>P390 Absorb spillage to prevent material damage.</p> <p>P330 Rinse mouth.</p> <p>P301+P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.</p> <p>P310 Immediately call a POISON CENTER or doctor/physician.</p> <p>P321 Specific treatment (see Seciton 4. on this label).</p> <p>P363 Wash contaminated clothing before reuse.</p> <p>P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting</p> <p>P303+P361+P353 SKIN (or hair) all contaminated clothing IF ON Take off. Rinse skin with water / shower.</p> <p>P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.</p> <p>P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing</p> <p>P308+P311 If exposed or concerns, call a poison center or physician</p> <p>P314 Get medical advice/attention if you feel unwell.</p> <p>P391 Collect spillage</p>
<b>Storage</b>	<p>P406 Store in corrosive resistant/... container with a resistant inner liner</p> <p>P405 Store locked up</p>
<b>Dispose</b>	<p>P501 (Refer to Table 5 of Enforcement Regulations of the Waste Management Act) Discard contents and container.</p>

**3. Other Hazard-Risk which are not included in the classification criteria**

NFPA index(0~4steps) : Health=3, Fire=0, Reaction=0

**Section 3 – COMPOSITION AND INFORMATION ON INGREDIENTS**

Chemical Name	Other Name	CAS No.	Content (%)
Ammonia solution	Ammonium hydroxide	1336-21-6	25 ~ 30
Water	Dihydrogen oxide	7732-18-5	70 ~ 75

**Section 4 – FIRST AID MEASURES**

<b>1. Eye Contact</b>	Rinse with plenty of water for at least 15minutes and get medical attention immediately.
<b>2. Skin Contact</b>	Take off contaminated cloths and shoes immediately, wash with plenty of water and soap for at least 15minutes.
<b>3. Inhalation</b>	Move victim to fresh air. If breathing is difficult, give artificial respiration and get medical attention immediately.
<b>4. Ingestion</b>	Do not induce vomiting. Get medical advice/attention immediately.
<b>5. Immediate medical attention and Notes for physician</b>	<p>Keep the medical personnel aware of the materials involved and take protective action.</p> <p>In case of inhalation, consider oxygen supply.</p> <p>Consider esophageal endoscopy when ingested, avoid gastric lavage.</p>

**Section 5 – FIRE-FIGHT MEASURES**

<b>1. Suitable extinguish media</b>	<p>Powder extinguisher, foam extinguisher, carbon dioxide, water spray</p> <p>Inappropriate extinguishing media: N/A</p>
<b>2. Special hazards arising from the substance</b>	<p>Thermal decomposition products: ammonia, nitrogen oxides</p> <p>FIRE AND EXPLOSION HAZARDS: Risk of fire is negligible</p>
<b>3. Special protective equipment and Precautions for fire-fighters</b>	<p>Move containers from fire area if you can do it without risk. When extinguishing a fire, be sure to wear personal protective equipment.</p> <p>If it is not possible to extinguish the fire, withdraw immediately. Keep containers cool by spraying with water for a long time, even after the fire is out. Isolate hazardous areas and deny access to people.</p>

**Section 6 – ACCIDENTAL RELEASE MEASURES**

<b>1. Personal precautions and</b>	Do not touch spilled material. Avoid inhalation and skin contact. In case
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<b>Emergency procedures</b>	of confined space, wear air respirator and ventilate and remove all sources of ignition.
<b>2. Environmental precautions</b>	Minimize leak/spill, collect and keep leak/spill in container
<b>3. Methods and material for containment and cleaning up</b>	Soak up with sand, clay and other inert absorbent material

**Section 7 – HANDING AND STORAGE**

<b>1. Precautions for safe Handling</b>	Avoid contact with skin and eyes. Avoid inhalation of vapor or mist. All containers should be grounded.
<b>2. Conditions for safe storage</b>	Keep container tightly closed in a dry, cool and well-ventilated place. Keep away from incompatible materials. Keep away from direct sunlight.

**Section 8 – EXPOSURE CONTROLS AND PERSONAL PROTECTION**

**1. Occupational exposure limit, biological exposure limit**  
**National law of Safety management of**  
Occupational Health and Safety Act  
TWA : 25ppm, 18mg/m<sup>3</sup>  
STEL : 35ppm 27mg/m<sup>3</sup> NH<sub>3</sub>

<b>2. Appropriate Engineering controls</b>	Ensure compliance with applicable exposure limits and operate local exhaust ventilation when working. If the substance is at risk of explosion, ventilation equipment should be explosion-resistant.
<b>3. Personal protective equipment</b>	
◦ <b>Respiratory protection</b>	When handling, wear a respirator for ammonia according to the Chemical Substance Control Act. Respiratory protection must be certified by the Health and Safety Administration. If you're concerned about the impact on the unknown concentrations, or other life and health in accordance with the working conditions, wear supplied-air respirator, air respirator
◦ <b>Eye-protection</b>	Wear safety goggles for handling chemicals as they may cause human health hazards. Install eye wash facilities and emergency eyewash stations near chemical handling sites.
◦ <b>Hand protection</b>	Wear safety gloves when handling the chemical substances in accordance with the Chemical Substances Control Act
◦ <b>Skin and body protection</b>	Wear chemical protective clothing 3 or 4 (full body) in accordance with the Chemicals Control Act when handling.

**Section 9 – PHYSICAL AND CHEMICAL PROPERTIES**

<b>1. Physical state and color</b>	Liquid(Colorless, Transparency)	<b>2. Odor</b>	Irritant odor
<b>3. threshold</b>	N/A	<b>4. pH</b>	11.6(1N 용액)
<b>5. Melting/Freezing point</b>	-77.1°C	<b>6. Boiling point/range</b>	35°C
<b>7. Flashing point</b>	N/A	<b>8. Evaporation speed</b>	N/A
<b>9. Flammability(solid, gas)</b>	N/A	<b>10. Flash or Explosion limit upper / lower</b>	N/A
<b>11. Vapor pressure</b>	115mmHg(20°C)	<b>12. Solubility</b>	Soluble
<b>13. Vapor density</b>	1.2	<b>14. Gravity</b>	0.9
<b>15. n-octanol-water Partition coefficient</b>	N/A	<b>16. Self ignition temp(°C)</b>	N/A
<b>17. Cracking temp(°C)</b>	N/A	<b>18. Viscosity</b>	N/A
<b>19. Molecular Weight</b>	35.05		

**Section 10 – STABILITY AND REACTIVITY**

<b>1. Chemical stability and Possibility of Hazardous Reactions</b>	Stable under normal temp. and pressure
<b>2. Conditions to Avoid</b>	Avoid high temperature, sparks, flames and other sources of ignition. Contact with combustible material may ignite or explode.
<b>3. Incompatible Materials</b>	Acids, combustible materials, halogens, metals, metal oxides, oxidants
<b>4. Hazardous Decomposition Products</b>	Thermal decomposition products: ammonia, nitrogen oxides

### Section 11 – TOXICOLOGICAL INFORMATION

#### 1. Information on the likely routes of exposure.

May cause burns

Burns, May cause death

#### 2. Health hazard information

◦Acute toxic	Oral : LD50 350mg/kg Rat Skin : N/A Inhalation : N/A
◦Serious skin corrosive / irritation	Causes severe skin burns
◦Serious eye damage / irritation	Causes eye damage (eye burns, redness)
◦Respiratory sensitization	N/A
◦Skin sensitization	May cause skin disorders and allergies
◦Carcinogenicity	N/A
◦Germ cell Mutagenicity	N/A
◦Reproductive toxic	N/A
◦Specific target organ toxicity (single exposure )	Respiratory tract Corrosion Inhalation of high concentrations of vapor may cause laryngeal species, respiratory tract inflammation, pneumonia, etc.
◦Specific target organ toxicity (repeated exposure )	Prolonged or repeated exposure (respiratory organs, lungs) may cause damage to organs and may cause eye diseases such as corneal injury, glaucoma, and cataracts.
◦Aspiration hazard	N/A

### Section 12 – ECOLOGICAL INFORMATION

<b>1. Aquatic and Terrestrial eco toxicity</b>	Fish toxicity : N/A Invertebrate toxicity : LC50 0.66 mg/l 48 hr Daphnia magna Sea algae : N/A
<b>2. Persistence and degradability</b>	Persistence : N/A Degradability : N/A
<b>3. Bioaccumulative potential</b>	Concentrations : N/A Bioaccumulative : N/A
<b>4. Mobility in soil</b>	N/A
<b>5. Other adverse effects</b>	N/A

### Section 13 – Disposable considerations

<b>1. Waste methods</b>	Dispose in accordance with local regulations. Neutralize with dilute hydrochloric acid, dilute with large amount of water and treat
<b>2. Waste warning</b>	Dispose prohibited substances and waste separately from others.

### Section 14 – TRANSPORT INFORMATION

<b>1. UN No.</b>	2672
<b>2. Proper shipping Name</b>	Ammonia solution relative density between 0.880 and 0.957 at 15°C in water, with more than 10% but not more than 35% ammonia
<b>3. Hazard class</b>	8(Corrosive substance)
<b>4. Packing group</b>	III
<b>5. Marine pollutant</b>	N/A
<b>6. Particular safety Measures for transportation</b>	Fire emergency : F-A Emergency measures RELEASE : S-B

#### Section 15 – REGULATORY INFORMATION

<b>1. Occupation safety and health acts</b>	Standard material of exposure Test material of working environment (Test period; 6months) Hazardous material of administration objective Process safety management substances
<b>2. Chemical Substances Control Act</b>	Toxicity Safety material for Accident
<b>3. National law of Safety management of hazardous material</b>	Non-described
<b>4. National law of management of Wastes</b>	Designated Waste, Toxic Waste
<b>5. Other domestic and foreign law</b>	EU classification information (confirmed classification result): C; R34 N; R50 EU classification information (Risk phrases): R34, R50 EU classification information (Safety phrases): S1 / 2, S26, S36 / 37/39, S45, S61

#### Section 16 – OTHER INFORMATION

<b>1. Material source</b>	A chemical information MSDS Safety and Health Agency National Institute of Environmental Research Chemical Information Systems Korea Industrial Technology National Fire Hazardous Materials Information System
<b>1. The 1<sup>st</sup> edition</b>	2002.07.30
<b>2. Revision and The final revision</b>	14 / 2019.09.25
<b>. Other references</b>	

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