Safety Data Sheet

Section 1 - Product and Company Identification

Product name：Ammonium Hydroxide
Other names：Ammonia aqueous; Ammonia solutions
Product use：--
Supplier's name：San Fu Chemical Co., Ltd.
Supplier's address：340 Hsiao Hsin Li, Shan-Hua District, Tainan City, Taiwan, R.O.C.
Supplier's phone：886-6-5837608 Emergency phone：886-6-5837608
FAX.：886-6-5839498

Section 2 - Hazards Identification

Classification：

1.	Acute Toxicity	Category 4 (Ingestion)
2.	Corrosive to Metals	Category 1
3.	Skin Corrosion/Irritation	Category 1
4.	Serious Eye Damage/Eye Irritation	Category 1
5.	Hazardous to the aquatic environment	Category 1

The Most Important Hazards and effect

Label element：Skull and crossbones, Corrosive

- Hazard symbol：
- Signal word：Danger

Hazard statement：

1. Toxic if swallowed
2. May corrosive metal
3. May cause sever skin burn and eye damage
4. May cause sever eye damage
5. Very toxic to aquatic organisms

Precautionary statement：

1. Seal the containers
2. Do not inhale gas/smoke/steam/fog
3. If contact with eyes, immediately wash with large amount of water, seek medical attention after

Others Hazard：Stabbing pain、the color of skin become white temporarily；if contact with flammable substances may cause conflagration；if store of a hermetically sealed container may cause expand immediately to explode.

Section 3 - Composition/Information On Ingredients

Chemical name：Ammonium_Hydroxide
Synonyms：Ammonia aqueous; Ammonia solutions
CAS No.：1336-21-6
Ingredient contributing to the hazard(%)：10~35%

Section 4 - First Aid Measures

The First-aid Information：

- Inhalation：
  1. Move to fresh air.
  2. If not breathing, give Artificial respiration by qualified personnel. If respiration or pulse has stopped, have a trained person administer Basic Life Support (CPR), avoid mouth to mouth.
  3. If breathing is difficult, give oxygen.
  4. Get medical attention immediately.
- Skin Contact：
  1. Remove contaminated clothing, shoes, and leather product. flush contaminated clothing with water for at least 15 minutes.
  2. Clean thoroughly the contaminated clothing before reuse or discard.
  3. Discard the contaminated leather goods. Do not reuse.
  4. Get medical attention immediately.
- Eye Contact：
  1. Immediately flush eyes with water for at least 15 minutes.
  2. Get medical attention immediately.
- Ingestion：
  1. Get medical attention immediately.
  2. If swallowed, don’t induce vomiting.
  3. If the patient is conscious, drink some water.
  4. If vomiting occurs spontaneously, make the patient lean forward, to avoid inhaling the vomitus.

The Most Important Symptoms and Hazardous Effects： 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.

Protection of First-aiders：
Wear class C equipment to do first aid in a safety zone.

Notes to a Physician：

1. If inhalation，consider to supply oxygen.
2. If ingestion，consider to use esophageal endoscopy，to avoid enema.

Section 5 - Fire Fighting Measures

Extinguishing Media：
General foam, chemical powder, carbon dioxide, or water spray.
When fight with large fire, use foam or water spray.

Specific Hazards when Fire-fight：tiny.

Specific Fire-fighting Procedure：

1. Move away the containers if safe.
2. Use water spray to cool fire-exposed containers.
3. Stay away from the ends of tanks.
4. Use suitable fire-fighting agents.
5. Do not spray water upon the substance directly.
6. Fire-fighting in a safe area.

7. Stay in the upwind area and stay away from the low-lying area. 8. To avoid inhalation the substance or burned vice products.
Specific Protection of Firefighters： As in any fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

Section 6 - Accidental Release Measures

Personal Precautions： 1. Restrict access to area until clean up. 2. Stay in the upwind area and stay away from the low-lying area.
Environmental Precautions： 1. Well-ventilated the contaminated area. 2. Isolate from ignition sources. 3. To forbid ignition sources .
Methods for Cleaning up： 1. Do not touch the leakage. 2. Stopping leaking if safe. Small leakage： 1. Absorb with dry earth or sand. 2. Move away the containers to a safe area. Large leakage： 1. Dike if necessary.

Section 7 - Handling and Storage

Handling： 1. Operate in the well-ventilated place. 2. Prevent the materials accumulated at depression or drainage holes. 3. Do not enter the confined space. 4. Avoid smoking, expose to naked light or ignition sources. 5. Avoid not contacting incompatible substances. 6. While operating, do not smoke or diet. 7. Seal the vessels tightly after the task. 8. Avoid making the physics damage of the container.
1. Storage： The substance will accumulate per oxidant, which will make damage if volatile, distillation or enrichment processing. 2. Make sure to finish the chemical substances before it be oxidized whenadopt this kind of per oxidant substances. 3. The authorized person has to manage the substances and label the per oxidation chemical compounds and its expiration date. The chemical substances have to be deoxidized or discarded. 4. Label the receiving date on the bottle; note the date every time when open it. 5. The safety storage duration of unopened product is 18 months; the opened product is limited not to use over 12 months. 6. Avoid personal contact, inhalation included. 7. Wear personal protective apparatus if situated in over exposed risk. 8. Wash hands with soaps and water each time finished the work.

9. Work suits should be washed separately.
10. Keep good professional habits.
11. Detect the air quality periodically to make sure the working environment safety.

Section 8 - Exposure Controls & Personal Protection

Engineering measures：

1. The use of local exhaust ventilation or other engineering controls is the preferred method of controlling exposure to airborne particulate.
2. Emergency eyewash stations and/or safety showers should be available in working area.

Control parameters			
TWA	STEL	Ceiling	Biological standards
2ppm	4ppm	--	--

Personal protective equipment：

- Respiratory Protection：(NIOSH Approved)

  Below 250ppm：Use breathing apparatus with anti-Ammonium cartridge，or positive-pressure with auxiliary self-contained air supply breathing apparatus.

  Below 300ppm： Wear continuous-flow mode respirator with oxygen contained breathing apparatus、breathing apparatus with anti-Ammonium cartridge powered air-purifying、full piece with anti-Ammonium cartridge breathing apparatus、full piece self-contained or positive-pressure with auxiliary self-contained air supply.

  Unknown concentration: portable with positive pressure mode breathing apparatus, full piece self-contained with positive pressure mode breathing apparatus.

  Rescue: Use breathing apparatus with full piece NH3 free chemical purifying cartridge。
- Hand Protection： Chemical protective gloves.
- Eye Protection：Chemical splash goggles/mask/full piece shield.
  Emergency shower should be available.
- Skin and Body Protection：Chemical protect suit.

Hygiene measures：

1. Remove contaminated clothes, clean thoroughly before reuse or disposal. Must advise the danger to the laundry worker.
2. Smoking, eating and drinking are prohibited in work area.
3. Wash hands thoroughly after handing this substance.
4. Maintain a clean work environment.

Section 9 - Physical & Chemical Properties

Appearance：liquid	Odor：odorless
Color：colorless	Melting Point: --
pH value：11.6 (1N aq soln)	Boiling point/boiling range：36℃
Flammability: --	Flash point：--
Decomposition temp：--	Test method (Opened or closed cup)：--
Auto ignition temp：--	Explosion properties：--

Vapor pressure：16.88 mmHg@15.5℃	Vapor density：1.2
Density：0.91(contains NH3 around 25%)	Solubility：soluble in water
log Kow：--	Evaporation Rate：--

Section 10 - Stability & Reactivity Data

Stability：Stable under normal temperature and pressure.

Possible hazardous reactions under specific conditions：
May cause conflagration or explosion.

Conditions to avoid：

1. Silver nitrate + Sodium hydroxide、Silver oxide、Sliver permanganate：Stroke sensitive substance may be formed.
2. Metal and alloy：May be corrode.
3. Halide：Cause intense reaction or explosive compounds.
4. Nitro-methane：To improve Nitro-methane to be exploded sensitivity.
5. Acid、Hyperchloric acid：Cause intense or explosive reaction.
6. Dimethyl sulfate：Cause intense or explosive reaction.
7. Silver nitrate + Ethyne：Explosive Ethyne compounds may be formed.
8. Acrolein、Propiolactone propylene oxide：Cause pressure and temperature to increase in airtight containers.

Materials to avoid：

1. acid, flammable materials, halocarbons, oxidizers, metal、metal oxide.

Hazardous decomposition products：
Ammonium gas、Nitro oxide.

Section 11 - Toxicological Information

Route of exposure：skin, inhalation, eye, ingestion.

Symptoms：coughing, asphyxia, burns with mucous membrane, low blood pressure, weak, quick pulse, pneumonia, pain in chest, difficulty in breathing, cyanosis, dizziness, burn in skin and eyes.

Immediate Toxicity：
Inhalation：

1. To expose in 5 ppm ammonium vapor causes mild irritation；9 to 50 ppm causes nose feel dry，fatigued olfaction and moderate irritation；150 ppm causes throat convulsions，500 ppm for 30 mins may cause intense breathing periodically、blood pressure increase、quick pulse、the upper respiratory tract irritation，these symptoms sometimes may arise continuously for 24 hrs；1500ppm to 10000ppm may cause difficulty in breathing、convulsive coughing、pain in chest、respiratory convulsions、pink foam sputum、asphyxia immediately、delayed pulmonary edema may cause death.
2. Other symptoms include lips swelling、feel fidgety、running nose、headache、slobber、nauseated、glottis edema、pharyngitis、tracheitis and difficulty in speaking.
3. Because throat convulsions、inflammation or edema to cause bronchopneumonia or asphyxia to cause death.

4. The sequela include raucous voice、coughing with sputum，respiratory function decrease、chronic trachea dysfunction、pulmonary alveolus disease、bronchopneumonia、bronchiectasis、emphysema and Anxiety Neurosis.
5. Because adaptation may cause irritation concentration transfer to endurance.

(Alkalinity corrosive substance)

1. May cause respiratory irritation with coughing、asphyxia、pain and burns with mucous membrane.
2. In severe cases may cause pulmonary edema or incubation in 5 to 72 hrs；the symptoms include pain in chest、difficulty in breathing、foam sputum、cyanosis、dizziness.
3. The symptoms of body include low blood pressure、weak、quick pulse、pneumonia.
4. In severe cases may cause death.

Skin：

1. Vapor may cause mild irritation，contact with liquid or high concentration vapor(30,000 ppm) directly may cause severe pain、irritation、burns、blain and dyeing as brown.
2. Corrodent area may soften、colloid and necrosis；skin tissue broken deeply.
3. If burns large area may cause death.
4. Ammonium vapor cause hives less.

(Alkalinity corrosive substance)

1. Contact directly may cause pain、burns、dyeing as brown.
2. Corrodent area may soften、colloid and necrosis；skin tissue destruction deeply.

Eye：

1. A drop of 9% solution causes severe pain immediately、face convulsions、flushing as possible as you can still loss upper skin of cornea；cornea edema then furrow to fully recover in 3 to 4 days.
2. Contact with liquid or high concentration vapor(>2500 ppm) may cause severe irritation、eye skin swelling、weep、eyelid edema、eye pressure increase、cornea ulcer may cause to loss sight.
3. Order of injury base on contact concentration and time，may cause eyeball and lens become turbid and iritis；accompany hyphema or abscess and may cause pigmentation layer loss large amount pigment behind the iris.
4. Cornea palsy may be caused before uncomfortable to cause eye damage.
5. Order of severe burns may not arise immediately，then complications may include edema、cornea vascularity form scar、cornea nontransparent permanent、acute glaucoma、uvation、cataract、retinal and iris atrophy.

(Alkalinity corrosive substance)

1. Contact directly may cause pain and burns.
2. May cause edema、epidermal destruction、cornea turbid and iritis.
3. Severe burns，all symptoms of injuries may not arise immediately；then complications may include edema、cornea vascularity form scar、cornea turbid permanent、uvation、cataract、eyeball adhesion and loss sight.

Ingestion：

1. May cause pain immediately，burns and mucosa corrosion around oral，first become white、bulla then become brown、edema and fester.
2. May cause large slobber and difficulty in speaking and swallowing .

3. Even do not have obvious oral burns，esophagus and gastric burn pain、vomit and diarrhea；large amount vomit with mucus、blood and mucous membrane.
4. Then edema may cause breathing pain and asphyxia.
5. May cause low blood pressure to shock、weak and quick pulse、wet and cold of skin；cycle prostration may arise continuously，if not give aid may cause renal failure.
6. Severe situation may be gastric and esophagus perforation，then may arise peritonitis accompany fever and abdomen stiff.
7. In initial few weeks may cause esophagus、gastric and pyloric stenosis、may delayed arise few months or years.
8. Asphyxia or cycle prostration reversed inhale substances may cause death in a few minutes.
   - LD_{50}: 350 mg/kg (Rat, Oral)
   - LC_{50}: --

Specific effects：
Order of injury base on contact concentration and time，repeated and prolonged exposure may cause oral inflammation and fester；also may arise bronchus and gastro-intestinal obstacle、dermatitis.

Section 12 - Ecological Information

Ecotoxicology：
- LC_{50}(fish)：1500 μg/L@96 hour(s)（Gambusia affinis）
- EC_{50}(Aquatic Invertebrates)：--
- Bioconcentration factor (BCF)：--

Persistence and degradability：
- Half-Life (Air)：--
- Half-Life (Water surface)：--
- Half-Life (Groundwater)：--
- Half-Life (Soil)：--

Bioaccumulative potential：--

Mobility in soil：--

Other adverse effects：--

Section 13 - Disposal Considerations

Methods of disposal：
1. Land treatment or burial (sanitary landfill) disposal practices. Prior to implementing land disposal of waste residue (including waste sludge), consult with environmental regulatory agencies for guidance on acceptable disposal practices.
2. Neutralization & discharge to sewer: Carefully dissolve in water and neutralize with dilute acetic acid. Flush to sewer with lots of water, regulations permitting or dispose of through a licensed contractor. Consider use of waste caustic for neutralizing plant acid wastes.

Section 14 - SDS Transport Information

UN classification number：UN2672

Proper D.O.T Shipping Name：Ammonium Hydroxide

Hazard Class：8
Packing Group：III
Marine pollution：Not applicable
Specific precautionary transport measures and conditions：--

Section 15 - Regulatory Information

Regulations：

1. Regulations for Labor Safety and Health Installations
2. Regulation of Labelling and Hazard Communication of Dangerous and Harmful Materials
3. Road Traffic Safety Regulations
4. Industrial Waste Storage and Disposal Regulations

Section 16 - Other Information

Literature references	1. GHS Globally Harmonized System of Classification and Labeling of Chemicals Database 2.CHEMINFO，CCINFO DISC 2005-3 3.RTECS DATABASE，TOME PLUS DISC，Vol.65，2005 4.HSDB DATABASE，TOME PLUSDISC，Vol.65，2005 5.Chemwatch DATABASE2005-1	
Prepared by	Suppler：San Fu Chemical Co., Ltd.	
	Address：340 Hsiao Hsin Li, Shan-Hua District, Tainan City, Taiwan, R.O.C.	
	Supplier's phone：886-6-5837608	FAX.：886-6-5839498
	Name：Shao Chen Hsu	
Issue date	Nov-10th2023	Revision：2
Re-revision date	Nov-09th2026	
Remarks	Symbols Explanations: "--" No information is available at this time. "/" Not applicable to this substance.	

■ This information above has consulted national or international papers and manufacturer or supplier's provided information. The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. Users should make their own determination of the suitability of the information for their particular purposes.