

FSH00211

Ammonium hydroxide

SECTION 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

产品说明: Product Description:	氨水 Ammonium hydroxide
Cat No. :	A667-212, A669-212, A669-500, A669P-500; A669-612GAL, A669-385LB, A669C-212, A669S-212, A669S-212EA, A669S-500; NC1020689
Synonyms	Ammonia solution; Ammonia water; Ammonium hydrate
Supplier	Fisher Scientific Company One Reagent Lane Fair Lawn, NJ 07410 Tel: (201) 796-7100
Emergency Telephone Number	CHEMTREC®, Inside the USA: 800-424-9300 CHEMTREC®, Outside the USA: 001-703-527-3887
E-mail address	begel.sdsdesk@thermofisher.com
Recommended Use Uses advised against	Laboratory chemicals. No Information available

SECTION 2. HAZARD IDENTIFICATION

Physical State
Liquid

Appearance
Colorless

Odor
Ammonia-like

Emergency Overview

Causes severe skin burns and eye damage. May cause respiratory irritation. Very toxic to aquatic life.

Classification of the substance or mixture

Skin Corrosion/Irritation	Category 1 B
Serious Eye Damage/Eye Irritation	Category 1
Specific target organ toxicity - (single exposure)	Category 3
Acute aquatic toxicity	Category 1

Label Elements



Signal Word

Danger

Hazard Statements

H314 - Causes severe skin burns and eye damage
 H335 - May cause respiratory irritation

H400 - Very toxic to aquatic life

Precautionary Statements**Prevention**

P264 - Wash face, hands and any exposed skin thoroughly after handling

P271 - Use only outdoors or in a well-ventilated area

P280 - Wear protective gloves/protective clothing/eye protection/face protection

Response

P301 + P330 + P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting

P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower

P304 + P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

P310 - Immediately call a POISON CENTER or doctor

P362 + P364 - Take off contaminated clothing and wash it before reuse

Storage

P403 + P233 - Store in a well-ventilated place. Keep container tightly closed

Disposal

P501 - Dispose of contents/ container to an approved waste disposal plant

Physical and Chemical Hazards

None identified.

Health Hazards

Corrosive. Causes skin and eye burns. May cause respiratory irritation.

Environmental hazards

Very toxic to aquatic life. The product is water soluble, and may spread in water systems.

Other Hazards

This product does not contain any known or suspected endocrine disruptors.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS No	Weight %
Water	7732-18-5	70-75
Ammonium hydroxide	1336-21-6	25-30
Ammonia	7664-41-7	-

SECTION 4. FIRST AID MEASURES**General Advice**

Immediate medical attention is required. Show this safety data sheet to the doctor in attendance.

Eye Contact

Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Immediate medical attention is required.

Skin Contact

Wash off immediately with plenty of water for at least 15 minutes. Immediate medical attention is required.

Inhalation

Remove to fresh air. If breathing is difficult, give oxygen. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Immediate medical attention is required.

Ingestion

Do NOT induce vomiting. Call a physician or Poison Control Centre immediately.

Most important symptoms and effects

Causes burns by all exposure routes. . Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation: Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or

esophagus should be investigated

Self-Protection of the First Aider

Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination.

Notes to Physician

Treat symptomatically.

SECTION 5. FIRE-FIGHTING MEASURES**Suitable Extinguishing Media**

CO₂, dry chemical, dry sand, alcohol-resistant foam. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Extinguishing media which must not be used for safety reasons

No information available.

Specific Hazards Arising from the Chemical

Keep product and empty container away from heat and sources of ignition. Thermal decomposition can lead to release of irritating gases and vapors.

Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

SECTION 6. ACCIDENTAL RELEASE MEASURES**Personal Precautions**

Ensure adequate ventilation. Use personal protective equipment as required. Keep people away from and upwind of spill/leak. Evacuate personnel to safe areas. Avoid contact with skin, eyes and inhalation of vapors.

Environmental Precautions

Should not be released into the environment. Keep out of waterways. Collect spillage. See Section 12 for additional Ecological Information.

Methods for Containment and Clean Up

Soak up with inert absorbent material. Keep in suitable, closed containers for disposal.

Refer to protective measures listed in Sections 8 and 13.

SECTION 7. HANDLING AND STORAGE**Handling**

Use only under a chemical fume hood. Wear personal protective equipment/face protection. Do not get in eyes, on skin, or on clothing. Do not ingest. If swallowed then seek immediate medical assistance. Do not breathe mist/vapors/spray.

Storage

Keep containers tightly closed in a dry, cool and well-ventilated place. Corrosives area.

Specific Use(s)

Use in laboratories

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION**Control Parameters**

Component	China	Taiwan	Thailand	Hong Kong
Ammonia	TWA: 20 mg/m ³ STEL: 30 mg/m ³	TWA: 50 ppm TWA: 35 mg/m ³	TWA: 50 ppm	TWA: 25 ppm TWA: 17 mg/m ³ STEL: 35 ppm STEL: 24 mg/m ³

Component	ACGIH TLV	OSHA PEL	NIOSH	The United Kingdom	European Union
Ammonia	TWA: 25 ppm STEL: 35 ppm	(Vacated) STEL: 35 ppm (Vacated) STEL: 27 mg/m ³ TWA: 50 ppm TWA: 35 mg/m ³	IDLH: 300 ppm TWA: 25 ppm TWA: 18 mg/m ³ STEL: 35 ppm STEL: 27 mg/m ³	STEL: 35 ppm 15 min STEL: 25 mg/m ³ 15 min TWA: 25 ppm 8 hr TWA: 18 mg/m ³ 8 hr	TWA: 20 ppm (8h) TWA: 14 mg/m ³ (8h) STEL: 50 ppm (15min) STEL: 36 mg/m ³ (15min)

Monitoring methods

BS EN 14042:2003 Title Identifier: Workplace atmospheres. Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents. MDHS70 General methods for sampling airborne gases and vapours MDHS 88 Volatile organic compounds in air. Laboratory method using diffusive samplers, solvent desorption and gas chromatography MDHS 96 Volatile organic compounds in air - Laboratory method using pumped solid sorbent tubes, solvent desorption and gas chromatography

Exposure Controls**Engineering Measures**

Use only under a chemical fume hood. Ensure that eyewash stations and safety showers are close to the workstation location. Wherever possible, engineering control measures such as the isolation or enclosure of the process, the introduction of process or equipment changes to minimise release or contact, and the use of properly designed ventilation systems, should be adopted to control hazardous materials at source.

Personal protective equipment

Eye Protection Goggles (European standard - EN 166)

Hand Protection Protective gloves

Glove material	Breakthrough time	Glove thickness	EU standard	Glove comments
Butyl rubber	> 480 minutes	0.5 mm	EN 374	(minimum requirement)
Viton (R)	> 480 minutes	0.4 mm		
Neoprene	> 480 minutes	0.45 mm		

Inspect gloves before use.

Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. (Refer to manufacturer/supplier for information)

Ensure gloves are suitable for the task: Chemical compatibility, Dexterity, Operational conditions, User susceptibility, e.g. sensitisation effects, also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion.

Remove gloves with care avoiding skin contamination.

Skin and body protection Wear appropriate protective gloves and clothing to prevent skin exposure

Respiratory Protection When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. To protect the wearer, respiratory protective equipment must be the correct fit and be used and maintained properly

Large scale/emergency use Use a NIOSH/MSHA or European Standard EN 136 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced
Recommended Filter type: Inorganic gases and vapours filter Type B Grey or Ammonia and organic ammonia derivatives filter Type K Green conforming to EN14387

Small scale/Laboratory use Use a NIOSH/MSHA or European Standard EN 149:2001 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.
Recommended half mask:- Valve filtering: EN405; or; Half mask: EN140; plus filter, EN 141

Ammonium hydroxide

When RPE is used a face piece Fit Test should be conducted

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice.

Environmental exposure controls

Prevent product from entering drains. Do not allow material to contaminate ground water system. Local authorities should be advised if significant spillages cannot be contained.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Colorless	
Physical State	Liquid	
Odor	Ammonia-like	
Odor Threshold	No data available	
pH	12	
Melting Point/Range	-57 °C / -70.6 °F	
Softening Point	No data available	
Boiling Point/Range	38 °C / 100.4 °F	
Flash Point	No information available	Method - No information available
Evaporation Rate	No data available	
Flammability (solid,gas)	Not applicable	Liquid
Explosion Limits	Lower 15 Vol% Upper 28 Vol%	
Vapor Pressure	500 hPa @ 20 °C	
Vapor Density	0.59	(Air = 1.0)
Specific Gravity / Density	0.88-0.91	
Bulk Density	Not applicable	Liquid
Water Solubility	Soluble	
Solubility in other solvents	No information available	
Partition Coefficient (n-octanol/water)		
Autoignition Temperature	651 °C / 1203.8 °F	
Decomposition Temperature	No data available	
Viscosity	No data available	
Explosive Properties	No information available	
Oxidizing Properties	No information available	

SECTION 10. STABILITY AND REACTIVITY

Stability	Stable under normal conditions.
Hazardous Reactions	None under normal processing.
Hazardous Polymerization	Hazardous polymerization does not occur.
Conditions to Avoid	Incompatible products. Excess heat.
Materials to avoid	Strong oxidizing agents. Metals. Acids. Fluorine. Halogens.

Hazardous Decomposition Products Nitrogen oxides (NOx).

SECTION 11. TOXICOLOGICAL INFORMATION**Product Information**

(a) acute toxicity;
Toxicology data for the components

SAFETY DATA SHEET**Ammonium hydroxide**

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Water	-	-	-
Ammonium hydroxide	LD50 > 350 mg/kg (Rat)		
Ammonia	LD50 = 350 mg/kg (Rat)		LC50 = 9850 mg/m ³ (Rat) 1 h LC50 = 13770 mg/m ³ (Rat) 1 h

(b) skin corrosion/irritation; Category 1 B

(c) serious eye damage/irritation; Category 1

(d) respiratory or skin sensitization;

Respiratory

No data available

Skin

No data available

(e) germ cell mutagenicity; No data available

(f) carcinogenicity; No data available

There are no known carcinogenic chemicals in this product

(g) reproductive toxicity; No data available

(h) STOT-single exposure; Category 3

Results / Target organs

Respiratory system

(i) STOT-repeated exposure; No data available

Target Organs

No information available.

(j) aspiration hazard; No data available

Symptoms / effects, both acute and delayed

Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation: Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity effects

Very toxic to aquatic organisms. The product contains following substances which are hazardous for the environment.

Component	Freshwater Fish	Water Flea	Freshwater Algae	Microtox
Ammonium hydroxide	0.53 mg/l LC50 96h 0.75 - 3.4 mg/l LC50 96h 8.2 mg/L LC50 96h	EC50: 0.66 mg/L/48h	-	-
Ammonia	LC50: 0.26 - 4.6 mg/L, 96h (Lepomis macrochirus) LC50: = 1.17 mg/L, 96h flow-through (Lepomis macrochirus) LC50: 0.73 - 2.35 mg/L, 96h (Pimephales promelas) LC50: = 5.9 mg/L, 96h static (Pimephales)	EC50 = 25.4 mg/L, 48h (Daphnia magna) NOEC = 0.79 mg/L (Daphnia magna)		EC50 = 2.0 mg/L 5 min

SAFETY DATA SHEET**Ammonium hydroxide**

	promelas) LC50: > 1.5 mg/L, 96h (Poecilia reticulata) LC50: = 1.19 mg/L, 96h static (Poecilia reticulata) LC50: = 0.44 mg/L, 96h (Cyprinus carpio)			
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Persistence and Degradability**Persistence**

Persistence is unlikely, based on information available.

**Degradation in sewage
treatment plant**

Contains substances known to be hazardous to the environment or not degradable in waste water treatment plants.

Bioaccumulative Potential

Bioaccumulation is unlikely

Mobility in soil

The product is water soluble, and may spread in water systems. Disperses rapidly in air

Endocrine Disruptor Information

This product does not contain any known or suspected endocrine disruptors

Persistent Organic Pollutant

This product does not contain any known or suspected substance

Ozone Depletion Potential

This product does not contain any known or suspected substance

SECTION 13. DISPOSAL CONSIDERATIONS**Waste from Residues/Unused
Products**

Should not be released into the environment. Waste is classified as hazardous. Dispose of in accordance with the European Directives on waste and hazardous waste. Dispose of in accordance with local regulations.

Contaminated Packaging

Dispose of this container to hazardous or special waste collection point.

Other Information

Do not flush to sewer. Waste codes should be assigned by the user based on the application for which the product was used. Do not empty into drains. Large amounts will affect pH and harm aquatic organisms. Solutions with high pH-value must be neutralized before discharge. Do not let this chemical enter the environment.

SECTION 14. TRANSPORT INFORMATION**Road and Rail Transport****UN-No**

UN2672

Proper Shipping Name

AMMONIA SOLUTION

Hazard Class

8

Packing Group

III

IMDG/IMO**UN-No**

UN2672

Proper Shipping Name

AMMONIA SOLUTION

Hazard Class

8

Packing Group

III

IATA**UN-No**

UN2672

Proper Shipping Name

AMMONIA SOLUTION

Hazard Class

8

Ammonium hydroxide

Packing Group III

Special Precautions for User No special precautions required

SECTION 15. REGULATORY INFORMATION

International Inventories

X = listed, China (IECSC), Europe (EINECS/ELINCS/NLP), U.S.A. (TSCA), Canada (DSL/NDSL), Philippines (PICCS), Japan (ENCS), Japan (ISHL), Australia (AICS), Korea (KECL).

Component	The Inventory of Hazardous Chemicals (2015 Edition)	List of dangerous goods GB 12268 - 2012	TCSI	IECSC	EINECS	TSCA	DSL	PICCS	ENCS	ISHL	AICS	KECL
Water	-	-	X	X	231-791-2	X	X	X	X		X	KE-35400
Ammonium hydroxide	X	-	X	X	215-647-6	X	X	X	X	X	X	KE-01688
Ammonia	X	X	X	X	231-635-3	X	X	X	X	X	X	KE-01625

Component	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Major Accident Notification	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Safety Report Requirements
Ammonia	50 tonne	200 tonne

National Regulations

SECTION 16. OTHER INFORMATION

Creation Date 23-Nov-2009
Revision Date 14-May-2024
Revision Summary Not applicable.

Training Advice

Chemical hazard awareness training, incorporating labelling, Safety Data Sheets (SDS), Personal Protective Equipment (PPE) and hygiene.

First aid for chemical exposure, including the use of eye wash and safety showers.

Use of personal protective equipment, covering appropriate selection, compatibility, breakthrough thresholds, care, maintenance, fit and standards.

Chemical incident response training.

Legend

CAS - Chemical Abstracts Service

EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

IECSC - Chinese Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

ENCS - Japanese Existing and New Chemical Substances

AICS - Australian Inventory of Chemical Substances

NZIoC - New Zealand Inventory of Chemicals

WEL - Workplace Exposure Limit

ACGIH - American Conference of Governmental Industrial Hygienists

DNEL - Derived No Effect Level

RPE - Respiratory Protective Equipment

LC50 - Lethal Concentration 50%

NOEC - No Observed Effect Concentration

PBT - Persistent, Bioaccumulative, Toxic

TWA - Time Weighted Average

IARC - International Agency for Research on Cancer

PNEC - Predicted No Effect Concentration

LD50 - Lethal Dose 50%

EC50 - Effective Concentration 50%

POW - Partition coefficient Octanol:Water

vPvB - very Persistent, very Bioaccumulative

Ammonium hydroxide

ICAO/IATA - International Civil Aviation Organization/International Air Transport Association

ADR - European Agreement Concerning the International Carriage of Dangerous Goods by Road

OECD - Organisation for Economic Co-operation and Development

BCF - Bioconcentration factor

IMO/IMDG - International Maritime Organization/International Maritime Dangerous Goods Code

MARPOL - International Convention for the Prevention of Pollution from Ships

ATE - Acute Toxicity Estimate

VOC - (Volatile Organic Compound)

Key literature references and sources for data

<https://echa.europa.eu/information-on-chemicals>

Suppliers safety data sheet, Chemadvisor - LOLI, Merck index, RTECS

Physical hazards

On basis of test data

Health Hazards

Calculation method

Environmental hazards

Calculation method

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. 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

End of Safety Data Sheet