



MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Material name	AMMONIUM HYDROXIDE
Version #	02
Revision date	06-15-2011
CAS #	Mixture
Product Codes	J.T.Baker: 4807, 5358, 5604, 5817, 5820, 5980, 5993, 7874, 9717, 9718, 9719, 9721, 9729, 9731, 9733, 9741, 9743 Macron: 0127, 3246, 3256, 3258, 6665, H893, IM5980, V006, V188, V222, V649, V893, XL002, XM187, XM189
Synonym(s)	Ammonia aqueous * Ammonia solutions
Manufacturer	Avantor Performance Materials, Inc.
Address	222 Red School Lane Phillipsburg, NJ 08865 US
Customer Service	800-582-2537
24 Hour Emergency	908-859-2151
Chemtrec	800-424-9300

2. Hazards Identification

Emergency overview	DANGER Corrosive. Causes severe skin and eye burns. Causes digestive tract burns. Harmful if swallowed. Mist or vapor extremely irritating to eyes and respiratory tract.
OSHA regulatory status	This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).
Potential health effects	
Routes of exposure	Ingestion. Inhalation. Skin contact. Eye contact.
Eyes	Corrosive. Causes severe eye burns. Vapor or spray may cause eye damage, impaired sight or blindness.
Skin	Corrosive. Causes severe skin burns.
Inhalation	Corrosive. May cause damage to mucous membranes in nose, throat, lungs and bronchial system.
Ingestion	Harmful if swallowed. Corrosive. Ingestion may produce burns to the lips, oral cavity, upper airway, esophagus and possibly the digestive tract.
Target organs	Eyes. Skin. Respiratory system.
Chronic effects	Corrosive. Prolonged contact causes serious tissue damage.
Potential environmental effects	Expected to be very toxic to aquatic organisms.

3. Composition / Information on Ingredients

Hazardous components	CAS #	Percent
AMMONIUM HYDROXIDE	1336-21-6	21 - 72
Non-hazardous components	CAS #	Percent
WATER	7732-18-5	28 - 79
Composition comments	Contains 10 - 35% NH3.	

4. First Aid Measures

First aid procedures

Eye contact	Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove contact lenses. Call a physician or poison control center immediately. In case of irritation from airborne exposure, move to fresh air. Get medical attention immediately.
Skin contact	Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician or poison control center immediately. Wash clothing separately before reuse. Destroy or thoroughly clean contaminated shoes.
Inhalation	Move to fresh air. If breathing stops, provide artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
Ingestion	Call a physician or poison control center immediately. Do not induce vomiting. If vomiting occurs, the head should be kept low so that stomach vomit doesn't enter the lungs.

Notes to physician

Keep victim under observation. Treat symptomatically.

General advice

In the case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Show this safety data sheet to the doctor in attendance. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire Fighting Measures

Flammable properties

The product is not flammable. No unusual fire or explosion hazards noted.

Extinguishing media

Suitable extinguishing media	Water spray. Carbon dioxide (CO ₂). Dry chemical powder. Foam.
Unsuitable extinguishing media	None known.

Protection of firefighters

Specific hazards arising from the chemical Fire may produce irritating, corrosive and/or toxic gases.

Protective equipment and precautions for firefighters Use water spray to cool unopened containers. Self-contained breathing apparatus and full protective clothing must be worn in case of fire. Cool containers exposed to flames with water until well after the fire is out.

Special protective equipment for fire-fighters

Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask. Wear self-contained breathing apparatus with a full facepiece operated in the positive pressure demand mode when fighting fires.

Specific methods

In the event of fire and/or explosion do not breathe fumes.

6. Accidental Release Measures

Personal precautions

Wear appropriate protective equipment and clothing during clean-up. Keep unnecessary personnel away. Keep upwind. Keep out of low areas. Ventilate closed spaces before entering them. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Local authorities should be advised if significant spillages cannot be contained.

Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not contaminate water. Avoid discharge into drains, water courses or onto the ground.

Methods for containment

Stop the flow of material, if this is without risk. Prevent entry into waterways, sewer, basements or confined areas. Dike the spilled material, where this is possible.

Methods for cleaning up

Large Spills: Neutralize spill area and washings with dilute acetic acid. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Dike far ahead of spill for later disposal.

Small Spills: Neutralize spill area and washings with dilute acetic acid. Wipe up with absorbent material (e.g. cloth, fleece). Collect in a non-combustible container for prompt disposal.

Never return spills in original containers for re-use. Clean surface thoroughly to remove residual contamination. Clean up in accordance with all applicable regulations.

J. T. Baker NEUTRACIT®-2 or BuCAIM® caustic neutralizers are recommended for spills of solutions of this product.

7. Handling and Storage

Handling

Wear appropriate personal protective equipment. Do not breathe mist or vapor. Do not get in eyes, on skin, on clothing. Do not taste or swallow. Use only with adequate ventilation. Wash thoroughly after handling. Do not eat, drink or smoke when using the product. Considerable heat is generated when water or acid is added, therefore when making solutions always add the caustic to the water or acid with constant stirring. See Section 8 of the MSDS for Personal Protective Equipment.

Storage

Do not store in metal containers. Keep tightly closed in a dry, cool and well-ventilated place.

8. Exposure Controls / Personal Protection

ACGIH

Components

	Type	Value
AMMONIUM HYDROXIDE (1336-21-6)	STEL	35.0000 ppm
	TWA	25.0000 ppm

Occupational exposure limits

U.S. - OSHA

Components

	Type	Value
AMMONIUM HYDROXIDE (1336-21-6)	PEL	50.0000 ppm
		35.0000 mg/m3

Engineering controls

Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Explosion proof exhaust ventilation should be used.

Personal protective equipment

Eye / face protection

Chemical goggles and face shield are recommended.

Skin protection

Wear appropriate chemical resistant clothing. Wear appropriate chemical resistant gloves.

Respiratory protection

If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. Respirator type: Chemical respirator with specific cartridge and full facepiece providing protection against the compound of concern.

General hygiene considerations

Provide eyewash station and safety shower. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical & Chemical Properties

Appearance

Clear.

Color

Colorless.

Odor

Ammoniacal.

Odor threshold

Not available.

Physical state	Liquid.
Form	Liquid.
pH	13.8 (29% NH3)
Melting point	-101.6 °F (-74.4 °C) (28.5% NH3)
Freezing point	-101.6 °F (-74.4 °C) (28.5% NH3)
Boiling point	81 °F (27.2 °C) (29.4% NH3)
Flash point	Not available.
Evaporation rate	Not available.
Flammability limits in air, upper, % by volume	28 % (NH3)
Flammability limits in air, lower, % by volume	15 % (NH3)
Vapor pressure	287.971 kPa
Specific gravity	0.9 (28% NH3)
Relative density	Not available.
Solubility (water)	Not available.
Partition coefficient (n-octanol/water)	Not available
Decomposition temperature	Not available.
Molecular weight	35.05
Molecular formula	H5-N-O

10. Chemical Stability & Reactivity Information

Chemical stability	Stable under normal temperature conditions.
Conditions to avoid	Excessive heat.
Incompatible materials	Strong oxidizing agents. Water. Acids. Metals. Halogens. Nitromethane.
Hazardous decomposition products	Ammonia. Nitrogen oxides (NOx).
Possibility of hazardous reactions	Hazardous polymerization does not occur.

11. Toxicological Information

Toxicological data

Components	Test Results
AMMONIUM HYDROXIDE (1336-21-6)	Acute Oral LD50 Rat: 350 mg/kg
Sensitization	Not a skin sensitizer.
Acute effects	Harmful if swallowed.
Local effects	Causes severe burns. Mist or vapor extremely irritating to eyes and respiratory tract.
Chronic effects	Corrosive. Prolonged contact causes serious tissue damage.
Carcinogenicity	This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.
Skin corrosion/irritation	Corrosive to skin and eyes.
Epidemiology	No epidemiological data is available for this product.
Mutagenicity	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
Reproductive effects	Contains no ingredient listed as toxic to reproduction
Teratogenicity	No data available to indicate product or any components present at greater than 0.1% may cause birth defects.
Symptoms and target organs	Corrosive effects.

Further information

Danger of very serious irreversible effects. Symptoms may be delayed.

12. Ecological Information**Ecotoxicological data****Components****Test Results**

AMMONIUM HYDROXIDE (1336-21-6)

LC50 Water flea (Daphnia magna): 0.66 mg/l 48.00 hours

LC50 Western mosquitofish (Gambusia affinis): 15 mg/l 96.00 hours

Ecotoxicity

Expected to be very toxic to aquatic organisms.

Environmental effects

Very toxic to aquatic organisms. An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Persistence and degradability

Expected to be readily biodegradable.

Partition coefficient (n-octanol/water)

Not available

13. Disposal Considerations**Waste codes**

D002: Waste Corrosive material [pH <=2 or =>12.5, or corrosive to steel]

Disposal instructions

Dispose of this material and its container to hazardous or special waste collection point. Incinerate the material under controlled conditions in an approved incinerator. All wastes must be handled in accordance with local, state and federal regulations.

Contaminated packaging

Since emptied containers retain product residue, follow label warnings even after container is emptied. Offer rinsed packaging material to local recycling facilities.

14. Transport Information**DOT****Basic shipping requirements:**

UN number UN2672
Proper shipping name Ammonia solution (with 10 - 35% ammonia)
Hazard class 8
Packing group III

Additional information:**Special provisions** IB3, IP8, T7, TP1**Basic shipping requirements:**

Labels required 8
Additional information:
Packaging exceptions 154
Packaging non bulk 203
Packaging bulk 241
ERG number 154

IATA**Basic shipping requirements:**

UN number 2672
Proper shipping name Ammonia solution (with 10 - 35% ammonia)
Hazard class 8
Packing group III

Additional information:**ERG code** 8L**IMDG****Basic shipping requirements:**

UN number 2672
Proper shipping name AMMONIA SOLUTION (WITH 10 - 35% AMMONIA)

Hazard class
Packing group

8
III



DOT



IATA



IMDG

15. Regulatory Information

US federal regulations

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

All components are on the U.S. EPA TSCA Inventory List.

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: De minimis concentration

AMMONIUM HYDROXIDE (CAS 1336-21-6) 1.0 %

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: Listed substance

AMMONIUM HYDROXIDE (CAS 1336-21-6) Listed.

CERCLA (Superfund) reportable quantity

AMMONIUM HYDROXIDE: 1000.0000

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories

Immediate Hazard - Yes
Delayed Hazard - No
Fire Hazard - No
Pressure Hazard - No
Reactivity Hazard - No

Section 311 hazardous chemical

Yes

Inventory status

Country(s) or region

Inventory name

On inventory (yes/no)*

Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

State regulations

This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

US - Pennsylvania RTK - Hazardous Substances: Listed substance

AMMONIUM HYDROXIDE (CAS 1336-21-6) Listed.

Saf-T-Data

Health: 2 - Moderate (Poison)
Flammability: 1 - Slight
Reactivity: 1 - Slight
Contact: 4 - Extreme (Corrosive)
Lab Protective Equip: D - GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: WS - White Stripe (Store Separately)

16. Labeling Info

Label Hazard Warning

DANGER

Corrosive. Causes severe skin and eye burns. Causes digestive tract burns. Harmful if swallowed. Mist or vapor extremely irritating to eyes and respiratory tract.

Label Precautions

Do not breathe mist or vapor. Do not get in eyes, on skin, or on clothing. Do not taste or swallow. Use only with adequate ventilation. Wash thoroughly after handling. Keep container tightly closed in a cool, well-ventilated place.

Label First Aid

Immediately flush eyes with plenty of water for at least 15 minutes. Immediately flush skin with plenty of water. If gas/fume/vapor/dust/mist from the material is inhaled, remove the affected person immediately to fresh air. Get medical attention immediately. IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Do not induce vomiting without advice from poison control center. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Do not use mouth-to-mouth method if victim ingested the substance.

17. Other Information

NFPA ratings

Health: 3
Flammability: 1
Instability: 0

Disclaimer

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