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, 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

<table>
<thead>
<tr>
<th>Hazardous components</th>
<th>CAS #</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMMONIUM HYDROXIDE</td>
<td>1336-21-6</td>
<td>21 - 72</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Non-hazardous components</th>
<th>CAS #</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>WATER</td>
<td>7732-18-5</td>
<td>28 - 79</td>
</tr>
</tbody>
</table>

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


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

<table>
<thead>
<tr>
<th>Components</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMMONIUM HYDROXIDE (1336-21-6)</td>
<td>STEL</td>
<td>35.0000 ppm</td>
</tr>
<tr>
<td></td>
<td>TWA</td>
<td>25.0000 ppm</td>
</tr>
</tbody>
</table>

Occupational exposure limits

<table>
<thead>
<tr>
<th>Components</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMMONIUM HYDROXIDE (1336-21-6)</td>
<td>PEL</td>
<td>50.0000 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>35.0000 mg/m3</td>
</tr>
</tbody>
</table>

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.
### 10. Chemical Stability & Reactivity Information

**Chemical stability**
- Stable under normal temperature conditions.

**Conditions to avoid**
- Excessive heat.

**Incompatible materials**

**Hazardous decomposition products**
- Ammonia. Nitrogen oxides (NOx).

**Possibility of hazardous reactions**
- Hazardous polymerization does not occur.

### 11. Toxicological Information

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

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

12. Ecological Information

Ecotoxicological data Components

<table>
<thead>
<tr>
<th>Component</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMMONIUM HYDROXIDE (1336-21-6)</td>
<td>LC50 Water flea (Daphnia magna): 0.66 mg/l 48.00 hours</td>
</tr>
<tr>
<td></td>
<td>LC50 Western mosquitofish (Gambusia affinis): 15 mg/l 96.00 hours</td>
</tr>
</tbody>
</table>

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

Labels required: 8

**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)
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

<table>
<thead>
<tr>
<th>Country(s) or region</th>
<th>Inventory name</th>
<th>On inventory (yes/no)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Australian Inventory of Chemical Substances (AICS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Domestic Substances List (DSL)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Non-Domestic Substances List (NDSL)</td>
<td>No</td>
</tr>
<tr>
<td>China</td>
<td>Inventory of Existing Chemical Substances in China (IECSC)</td>
<td>Yes</td>
</tr>
<tr>
<td>Europe</td>
<td>European Inventory of Existing Commercial Chemical Substances (EINECS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Europe</td>
<td>European List of Notified Chemical Substances (ELINCS)</td>
<td>No</td>
</tr>
<tr>
<td>Japan</td>
<td>Inventory of Existing and New Chemical Substances (ENCS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Korea</td>
<td>Existing Chemicals List (ECL)</td>
<td>Yes</td>
</tr>
<tr>
<td>New Zealand</td>
<td>New Zealand Inventory</td>
<td>Yes</td>
</tr>
<tr>
<td>Philippines</td>
<td>Philippine Inventory of Chemicals and Chemical Substances (PICCS)</td>
<td>Yes</td>
</tr>
<tr>
<td>United States &amp; Puerto Rico</td>
<td>Toxic Substances Control Act (TSCA) Inventory</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*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

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