1. Product and Company Identification

<table>
<thead>
<tr>
<th>Material name</th>
<th>TETRAMETHYLAMMONIUM HYDROXIDE in water</th>
</tr>
</thead>
<tbody>
<tr>
<td>Version #</td>
<td>03</td>
</tr>
<tr>
<td>Revision date</td>
<td>01-17-2012</td>
</tr>
<tr>
<td>CAS #</td>
<td>Mixture</td>
</tr>
<tr>
<td>Product Codes</td>
<td>J.T.Baker: 5866, 5878, 5879, V649</td>
</tr>
<tr>
<td></td>
<td>Macron: 37812</td>
</tr>
<tr>
<td>Synonym(s)</td>
<td>Ammonium, tetramethyl-, hydroxide * TMAH</td>
</tr>
<tr>
<td>Manufacturer</td>
<td>Avantor Performance Materials, Inc.</td>
</tr>
<tr>
<td>Address</td>
<td>3477 Corporate Parkway</td>
</tr>
<tr>
<td></td>
<td>Suite #200</td>
</tr>
<tr>
<td></td>
<td>Center Valley, PA 18034</td>
</tr>
<tr>
<td></td>
<td>US</td>
</tr>
<tr>
<td>Customer Service</td>
<td>855-282-6867</td>
</tr>
<tr>
<td>24 Hour Emergency</td>
<td>908-859-2151</td>
</tr>
<tr>
<td>Chemtrec</td>
<td>800-424-9300</td>
</tr>
</tbody>
</table>

2. Hazards Identification

| Emergency overview | DANGER -- POISON
|                   | Corrosive. Causes skin and eye burns. May be fatal if inhaled, absorbed through skin, or swallowed. |
| OSHA regulatory status | This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication). |
| Potential health effects | Inhalation. Ingestion. Skin contact. Eye contact. |
| Routes of exposure | Corrosive to the eyes and may cause severe damage including blindness. Causes eye burns. Risk of serious damage to eyes. Do not get this material in contact with eyes. |
| Eyes | Causes skin burns. May be harmful if absorbed through skin. Do not get this material in contact with skin. |
| Skin | Inhalation causes burns. Inhalation of mists or vapors may produce upper airway edema, wheezing, pulmonary edema, pneumonitis and respiratory failure. Do not breathe dust/fume/gas/mist/vapors/spray. |
| Inhalation | Causes burns. Inhalation of mists or vapors may produce upper airway edema, wheezing, pulmonary edema, pneumonitis and respiratory failure. Do not breathe dust/fume/gas/mist/vapors/spray. |
| Ingestion | May be fatal if swallowed. Ingestion causes burns of the upper digestive and respiratory tracts. Ingestion may produce burns to the lips, oral cavity, upper airway, esophagus and possibly the digestive tract. Do not ingest. |
| Signs and symptoms | Contact with this material will cause burns to the skin, eyes and mucous membranes. Experimental studies have indicated that TMAH is a weak inhibitor of acetylcholinesterase and acts as a cholinergic (muscarinic and nicotinic) agonist. Depending on the level and duration of exposure, signs and symptoms may include blurred or double vision; pinpoint pupils; changes in heart rate and blood pressure; abdominal cramping, nausea and vomiting; diarrhea, excessive salivation, sweating or bronchial secretions; urinary incontinence; muscle twitching, tremors or convulsions. Other symptoms consistent with cholinergic activity may also be observed. |
| Potential environmental effects | Ecological injuries are not known or expected under normal use. |

3. Composition / Information on Ingredients

<table>
<thead>
<tr>
<th>Hazardous components</th>
<th>CAS #</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>TETRAMETHYLAMMONIUM HYDROXIDE</td>
<td>75-59-2</td>
<td>20 - 40</td>
</tr>
<tr>
<td>Non-hazardous components</td>
<td>CAS #</td>
<td>Percent</td>
</tr>
<tr>
<td>WATER</td>
<td>7732-18-5</td>
<td>60 - 80</td>
</tr>
</tbody>
</table>
4. First Aid Measures

First aid procedures

Eye contact
Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention immediately.

Skin contact
Remove and isolate contaminated clothing and shoes. Immediately flush skin with plenty of water. Get medical attention immediately. For minor skin contact, avoid spreading material on unaffected skin. Wash clothing separately before reuse.

Inhalation
Move to fresh air. Oxygen or artificial respiration if needed. Do not use mouth-to-mouth method if victim inhaled the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Get medical attention immediately.

Ingestion
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Do not induce vomiting without advice from poison control center. Never give anything by mouth to a victim who is unconscious or is having convulsions. Do not use mouth-to-mouth method if victim ingested the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Rinse mouth thoroughly. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.

Notes to physician
In case of shortness of breath, give oxygen. Keep victim warm.

General advice
Immediate medical attention is required. In case of shortness of breath, give oxygen. Keep victim warm. 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

Protection of firefighters
In the event of fire, cool tanks with water spray. Use water spray to cool unopened containers. Cool containers exposed to flames with water until well after the fire is out.

Specific methods
In the event of fire, cool tanks with water spray. Use water spray to cool unopened containers.

6. Accidental Release Measures

Personal precautions
Ensure adequate ventilation. Keep unnecessary personnel away. Wear appropriate protective equipment and clothing during clean-up. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them.

Environmental precautions
Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground.

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

Methods for cleaning up
Large Spills: Dike far ahead of spill for later disposal. 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.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece).

Never return spills in original containers for re-use. Clean surface thoroughly to remove residual contamination. Do not flush to sewer.

7. Handling and Storage

Handling
Do not get this material in contact with eyes. Do not get this material in contact with skin. Do not get this material on clothing. Do not use in areas without adequate ventilation. Wash thoroughly after handling. 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. Handle and open container with care.
Storage

8. Exposure Controls / Personal Protection

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. Ensure adequate ventilation, especially in confined areas.

Personal protective equipment

Eye / face protection
Chemical goggles are recommended. Face-shield. Provide eyewash station and safety shower. Do not get in eyes.

Skin protection
Wear appropriate chemical resistant clothing. Chemical resistant gloves. Do not get this material in contact with skin. Do not get this material on clothing.

Respiratory protection
Use a positive-pressure air-supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air-purifying respirators may not provide adequate protection. Do not breathe dust/fume/gas/mist/vapors/spray.

General hygiene considerations
Do not get in eyes. Do not get this material in contact with skin. Do not get this material on clothing. When using, do not eat, drink or smoke. Keep away from food and drink. Handle in accordance with good industrial hygiene and safety practice.

General
Structural firefighters protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations.

9. Physical & Chemical Properties

Appearance
Clear.

Color
Colorless to light yellow.

Odor
Strong. Ammoniacal.

Odor threshold
Not available.

Physical state
Liquid.

Form
Liquid.

pH
13

Boiling point
215.6 °F (102 °C)

Flash point
> 201.2 °F (> 94 °C) Pensky-Martens Closed Cup

Evaporation rate
Not available.

Flammability limits in air, upper, % by volume
Not available.

Flammability limits in air, lower, % by volume
Not available.

Vapor density
Not available.

Specific gravity
1 @ 20 C

Relative density
Not available.

Solubility (water)
Complete

Partition coefficient (n-octanol/water)
Not available

Auto-ignition temperature
Not available.

Decomposition temperature
Not available.

Molecular formula
(CH3)4NOH in H2O

10. Chemical Stability & Reactivity Information

Chemical stability
Material is stable under normal conditions.
**Conditions to avoid**
This product may react with oxidizing agents. Do not mix with other chemicals. Reacts violently with strong acids. Moisture.

**Incompatible materials**
Oxidizing agents. Acids.

**Hazardous decomposition products**

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

### 11. Toxicological Information

#### Toxicological data

<table>
<thead>
<tr>
<th>Product</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>TETRAMETHYLAMMONIUM HYDROXIDE in water (Mixture)</td>
<td>Acute Dermal LD50 Guinea pig: 102 mg/kg estimated</td>
</tr>
</tbody>
</table>

#### Components

<table>
<thead>
<tr>
<th>Product</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>TETRAMETHYLAMMONIUM HYDROXIDE (75-59-2)</td>
<td>Acute Dermal LD50 Guinea pig: 25 mg/kg</td>
</tr>
</tbody>
</table>

* Estimates for product may be based on additional component data not shown.

**Acute effects**
Causes burns.

**Chronic effects**
Not available.

**Carcinogenicity**
This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

**Skin corrosion/irritation**
Hazardous by OSHA criteria.

**Epidemiology**
Not available.

**Neurological effects**
Not available.

### 12. Ecological Information

**Ecotoxicity**
This product has no known eco-toxicological effects.

**Environmental effects**
Not available.

**Persistence and degradability**
Not available.

**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. Dispose in accordance with all applicable regulations.

### 14. Transport Information

**DOT**

**Basic shipping requirements:**

<table>
<thead>
<tr>
<th>UN number</th>
<th>Hazard class</th>
<th>Packing group</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN1835</td>
<td>8</td>
<td>II</td>
</tr>
</tbody>
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**Additional information:**

<table>
<thead>
<tr>
<th>Special provisions</th>
<th>Basic shipping requirements:</th>
</tr>
</thead>
<tbody>
<tr>
<td>B2, IB2, T7, TP2</td>
<td>8</td>
</tr>
</tbody>
</table>

**Labels required**

<table>
<thead>
<tr>
<th>Packaging exceptions</th>
<th>Packaging non bulk</th>
<th>Packaging bulk</th>
<th>ERG number</th>
</tr>
</thead>
<tbody>
<tr>
<td>154</td>
<td>202</td>
<td>242</td>
<td>153</td>
</tr>
</tbody>
</table>
**Basic shipping requirements:**

- **UN number**: 1835
- **Proper shipping name**: Tetramethylammonium hydroxide solution
- **Hazard class**: 8
- **Packing group**: II
- **Additional information**: 
  - **ERG code**: 8L

**IMDG**

- **Basic shipping requirements:**
  - **UN number**: 1835
  - **Proper shipping name**: TETRAMETHYLAMMONIUM HYDROXIDE SOLUTION
  - **Hazard class**: 8
  - **Packing group**: II

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**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.

**CERCLA (Superfund) reportable quantity**

None

**Superfund Amendments and Reauthorization Act of 1986 (SARA)**

- **Hazard categories**
  - Immediate Hazard - Yes
  - Delayed Hazard - Yes
  - 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
**Country(s) or region**
Philippines
United States & Puerto Rico

**Inventory name**
Philippine Inventory of Chemicals and Chemical Substances (PICCS)
Toxic Substances Control Act (TSCA) Inventory

**On inventory (yes/no)**
Yes
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.

**Saf-T-Data**
Health: 3 - Severe (Life)
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: W - White (Corrosive)

**16. Labeling Info**

**Label Hazard Warning**
DANGER -- POISON
Corrosive. Causes skin and eye burns. May be fatal if inhaled, absorbed through skin, or swallowed.

**Label Precautions**
Do not breathe mist or vapor. Do not get in eyes, on skin, or on clothing. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling.

**Label First Aid**
Immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately. Immediately flush skin with plenty of water. Get medical attention immediately. 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. Never give anything by mouth to a victim who is unconscious or is having convulsions. Do not use mouth-to-mouth method if victim ingested the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Rinse mouth thoroughly. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.

**17. Other Information**

**NFPA ratings**
Health: 3
Flammability: 1
Instability: 0
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