Material Safety Data Sheet (MSDS)

II IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Identification of the Preparation:
25% TMAH

Product use:
Developer and cleaner in the electronics industry.

Company/Undertaking:
Manufacturer:
Moses Lake Industries, Inc.
8248 Randolph Rd NE
Moses Lake, WA 98837
USA
(509) 762-5336 FAX (509) 762-5981

Emergency Telephone Number:
CHEMTREC # (800) 424-9300 (Inside U.S.)
(703) 527-3887 (Outside U.S.) Collect calls accepted

COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS No.</th>
<th>Wt %</th>
<th>EINECS No. EC No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetramethylammonium Hydroxide</td>
<td>75-59-2</td>
<td>&lt;28 %</td>
<td>200-882-9</td>
</tr>
<tr>
<td>Water</td>
<td>7732-18-5</td>
<td>balance</td>
<td>231-791-2</td>
</tr>
</tbody>
</table>

3 HAZARDS IDENTIFICATION

Emergency Overview
Danger! Corrosive. Causes eye and skin burns. May cause severe respiratory tract irritation with possible burns in mist or aerosol form. May cause severe digestive system tract irritation with possible burns if ingested. May be harmful or fatal if inhaled or swallowed.

4 FIRST AID MEASURES

Emergency and First Aid Procedures:
Ingestion: If victim is conscious and alert, give 2-4 cupfuls of water or milk. Never give anything by mouth to an unconscious person. Get medical aid immediately. Do not induce vomiting.
Inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Prompt action is essential. Seek medical attention.
Skin Contact: In case of contact, immediately flush skin with water for at least 15 minutes while removing contaminated clothing, shoes. Wash clothing before reuse.
Eye Contact: In case of contact, flush immediately with water for at least 15 minutes. Seek medical attention.

N/E = Not Established        N/A = Not Applicable        MLI MSDS TMAH US l6pt 040716.doc
= FIRE FIGHTING MEASURES =

Fire Hazards: Not combustible.

Suitable Fire Extinguishing Media: Use appropriate media for surrounding fire.

Special Fire Fighting Procedures: Wear self-contained breathing apparatus with full face piece in positive pressure mode and proper protective clothing. Move containers from fire area if it can be done without risk.

Unusual Fire and Explosion Hazards: None found.

Decomposition Products: Produces toxic fumes of NO, and NH₃ when heated to decomposition.

6 ACCIDENTAL RELEASE MEASURES

General Information: Use proper personal protective equipment as indicated in Section 8. Avoid discharge to the environment.

Spills/Leaks: Contain and absorb spilled product wearing appropriate personal protective equipment. Stop leak if able to do so without risk. Using clean shovel (plastic preferred) place in clean, dry container and cover.

7 HANDLING AND STORAGE

Handling: Avoid contact with skin, eyes, and clothing. Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Empty containers retain product residue and can be dangerous. Avoid ingestion and inhalation.

Storage: Store in corrosion resistant area. Do not store with incompatible materials. Keep tightly closed. Keep containers away from heat and out of sun. Exposure to air causes absorption of CO₂ to produce carbonate.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Airborne Exposure Limits:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS No.</th>
<th>EINECS No.</th>
<th>ACGIH/TLV</th>
<th>OSHA/PEL</th>
<th>U.K. TWA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetramethylammonium hydroxide</td>
<td>75-59-2</td>
<td>200-882-9</td>
<td>N/E</td>
<td>N/E</td>
<td>N/E</td>
</tr>
</tbody>
</table>

Ventilation System: Use general or local exhaust ventilation to meet TLV requirements.

Personal respirators: Not required with adequate ventilation. If airborne concentration is above TLV, use of self-contained breathing apparatus (SCBA) is recommended.

Skin protection: Avoid skin contact, wear gloves and protective clothing (lab coat, apron, coveralls). Gloves subject to permeation or any sign of degradation must be removed and replaced immediately.

Eye protection: Use chemical safety glasses and/or a full face shield where splashing is possible. Maintain shower/eyewash facilities in work area.

N/E = Not Established  N/A = Not Applicable  MLI MSDS TMAH US 16pt 040716.doc
9 PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance &amp; Odor</td>
<td>Clear, colorless. Slight amine odor</td>
</tr>
<tr>
<td>Vapor Pressure (mmHg)</td>
<td>N/E</td>
</tr>
<tr>
<td>Flash Point °C (°F)</td>
<td>Not combustible.</td>
</tr>
<tr>
<td>Auto Ignition Temp °C (°F)</td>
<td>N/A</td>
</tr>
<tr>
<td>Boiling Point °C (°F)</td>
<td>&gt;100 (&gt;212)</td>
</tr>
<tr>
<td>Melting Point °C (°F)</td>
<td>&lt; 0 (&lt;32)</td>
</tr>
<tr>
<td>PH</td>
<td>&gt;12.5</td>
</tr>
<tr>
<td>Specific Gravity (H2O=1)</td>
<td>1.0-1.1</td>
</tr>
</tbody>
</table>

10 STABILITY AND REACTIVITY

- Stability: Stable
- Hazardous Polymerization: Will not occur
- Conditions to Avoid: Heat, boiling temperatures
- Materials to Avoid: Strong acids.
- Hazardous Decomposition Products: Tetramethylammonium carbonate, methanol, trimethylamine

11 TOXICOLOGICAL INFORMATION

A. Toxicity of Components
   - Tetramethylammonium Hydroxide
     - scu-mus LD₅₀: 19 mg/kg
     - ivn-rbt LD₅₀: 1 mg/kg

Results from an experimental study in rats demonstrated lethality following one or more skin applications of tetramethylammonium hydroxide at dose levels of 30 mg/kg and higher.

- Carcinogenicity: NTP: No IARC: No Z list: No OSHA Reg: No
- Reproductive Effects: None found

B. Effects of Overexposure:
   - Inhalation: Severe irritation or burns to respiratory system, pulmonary edema, lung damage.
   - Skin Contact: Severe burns.
   - Eye Contact: Severe burns. Risk of blindness.
   - Skin Absorption: None identified.
   - Ingestion: Is harmful, may be fatal. Severe burns to mouth, throat and stomach. Nausea, vomiting, kidney dysfunction.
   - Chronic Effects: Lung damage.
   - Target Organs: Eyes, skin, respiratory system, teeth, kidneys.
   - Primary Routes of Entry: Skin contact, eye contact, ingestion, and inhalation.
   - Medical Conditions Generally Aggravated by Exposure: Respiratory system disease.
112 ECOLOGICAL INFORMATION

Ecotoxicity:
None found

Environmental:
None found

113 DISPOSAL CONSIDERATIONS

Disposal Procedure: Dispose in accordance with federal, state and local regulations. Waste material is corrosive.

TRANSPORT INFORMATION

Proper D.O.T Shipping Name: Tetramethylammonium hydroxide solution
UN/NA: UN 1835
Hazard Class: 8
Label: Corrosive
Packing Group: II

115 REGULATORY INFORMATION

TSCA: All components of this product are listed on the TSCA Chemical Inventory

CERCLA: No components listed.

SARA Title No components listed. Acute hazard under SARA 311/312.

116 OTHER INFORMATION

The information furnished herein is believed to be accurate and represents the best data currently available to us. No warranty, expressed or implied, is made and Moses Lake Industries, Inc. assumes no legal responsibility or liability whatsoever resulting from its use.