Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

MICROPOSIT™ MF™-321 DEVELOPER

Revision date: 04/18/2008

Supplier
ROHM AND HAAS ELECTRONIC MATERIALS LLC
A Subsidiary of The Dow Chemical Company
455 FOREST STREET
MARLBOROUGH, MA 01752 United States

For non-emergency information contact: 215-592-3000

For non-emergency information contact: 508-481-7950
Emergency telephone number 1 800 424 9300
Local emergency telephone number 989-636-4400

2. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>7732-18-5</td>
<td>&gt; 95.0 %</td>
</tr>
<tr>
<td>Surfactant</td>
<td></td>
<td>&lt; 1.0 %</td>
</tr>
<tr>
<td>Tetramethylammonium hydroxide</td>
<td>75-59-2</td>
<td>1.91 %</td>
</tr>
</tbody>
</table>

3. HAZARDS IDENTIFICATION

Emergency Overview
Appearance

Form liquid
Colour colourless
Odour Amines
Hazard Summary

<table>
<thead>
<tr>
<th>Hazard Summary</th>
<th>WARNING!</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkaline liquid and vapor. Causes skin, eye, and respiratory tract irritation. Onset of symptoms may be delayed. Prolonged, repeated contact, inhalation, ingestion, or absorption through the skin, may cause adverse effects to internal organ systems.</td>
<td></td>
</tr>
</tbody>
</table>

Potential Health Effects

Primary Routes of Entry: Inhalation, ingestion, eye and skin contact, absorption.

Eyes: May cause pain, transient irritation and superficial corneal effects.

Skin: Material may cause irritation. Prolonged or repeated exposure may have the following effects:
- central nervous system depression
- drowsiness
- defatting of skin leading to irritation and dermatitis

Ingestion: Swallowing may have the following effects:
- irritation of mouth, throat and digestive tract
- Repeated doses may have the following effects:
  - central nervous system depression
  - drowsiness

Inhalation: Inhalation may have the following effects:
- irritation of nose, throat and respiratory tract
- Higher concentrations may have the following effects:
  - systemic effects similar to those resulting from ingestion

Target Organs: Eye
- Respiratory System
- Skin
- nervous system

Carcinogenicity
- Not considered carcinogenic by NTP, IARC, and OSHA

4. FIRST AID MEASURES

Inhalation: Remove from exposure. If there is difficulty in breathing, give oxygen. Seek medical attention if symptoms persist.

Skin contact: Wash skin with water. Continue washing for at least 15 minutes. Obtain medical attention if blistering occurs or redness persists.

Eye contact: Immediately flush the eye with plenty of water for at least 15 minutes, holding the eye open. Obtain medical attention if soreness or redness persists.

Ingestion: Wash out mouth with water. Have victim drink 1-3 glasses of water to dilute stomach contents. Immediate medical attention is required. Never administer anything by mouth if a victim is losing consciousness, is unconscious or is convulsing.

Notes to physician: Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Flash point: not applicable

Suitable extinguishing media: Not readily combustible.
Select extinguishing agent appropriate to other materials involved.

**Specific hazards during fire fighting:** No specific measures necessary.

**Special protective equipment for fire-fighters:** Wear full protective clothing and self-contained breathing apparatus.

**Further information:** This product may give rise to hazardous vapors in a fire.

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### 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions**

Wear suitable protective clothing.

**Environmental precautions**

Prevent the material from entering drains or water courses.

Do not discharge directly to a water source.

Advise Authorities if spillage has entered watercourse or sewer or has contaminated soil or vegetation.

**Methods for cleaning up**

Cover with absorbent or contain. Collect and dispose.

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### 7. HANDLING AND STORAGE

**Handling**

Use only in well-ventilated areas. Avoid breathing vapor. Avoid contact with eyes, skin and clothing. Keep container tightly closed.

**Further information on storage conditions:** No special precautions necessary.

**Storage**

Storage conditions: Store in original container. Storage area should be: cool dry well ventilated out of direct sunlight away from incompatible materials

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### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Exposure limit(s)**

Exposure limits are listed below, if they exist.

**Eye protection:** Goggles

**Hand protection:** Butyl rubber gloves. Other chemical resistant gloves may be recommended by your safety professional.

**Skin and body protection:** Normal work wear.

**Respiratory protection:** Respiratory protection if there is a risk of exposure to high vapor concentrations. The specific respirator selected must be based on the airborne concentration found in the workplace and must not exceed the working limits of the respirator.

**Engineering measures:** Engineering methods to prevent or control exposure are preferred. Methods include process or personnel enclosure, mechanical ventilation (local exhaust), and control of process conditions.

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### 9. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance**

- **Form:** liquid
- **Colour:** colourless
- **Odour:** Amines
- **pH:** 12
- **Boiling point/boiling range:** > **** (> 212 °F)
- **Flash point:** not applicable
Component: **Tetramethylammonium hydroxide**

**Vapour pressure** 17.5 mmHg at 20 °C (68 °F)

Relative vapour density  
Water solubility completely soluble
Relative density 1.05
Evaporation rate Slower than ether
VOC's not applicable

NOTE: The physical data presented above are typical values and should not be construed as a specification.

### 10. STABILITY AND REACTIVITY

**Hazardous reactions**  
Stable under normal conditions.

**Conditions to avoid**  
contact with incompatible materials

**Materials to avoid**  
Acids. Oxidizers

**Hazardous decomposition products**  
None known.

**polymerization**  
Will not occur.

### 11. TOXICOLOGICAL INFORMATION

Toxicological information on this product or its components appear in this section when such data is available.

Component: **Tetramethylammonium hydroxide**

**Acute oral toxicity**  
LD50 rat male 34 - 50 mg/kg

Component: **Tetramethylammonium hydroxide**

**Acute dermal toxicity**  
LD50 rabbit >2,000 mg/kg see user defined free text

Component: **Tetramethylammonium hydroxide**

**Acute dermal toxicity**  
LD50 rat 449 mg/kg  
Test substance: see user defined free text

Component: **Tetramethylammonium hydroxide**

**Skin irritation**  
This material is corrosive.

Component: **Tetramethylammonium hydroxide**

**Eye irritation**  
This material is corrosive.

### 12. ECOLOGICAL INFORMATION

Ecotoxicological information on this product or its components appear in this section when such data is available.
Tetramethylammonium hydroxide

Elimination information (persistence and degradability)

Biodegradability
Readily biodegradable

Ecotoxicity effects
Toxicity to aquatic invertebrates
Daphnia magna (Water flea) 96 h
13.9 mg/l
Calculated

13. DISPOSAL CONSIDERATIONS

Environmental precautions: Prevent the material from entering drains or water courses.
Do not discharge directly to a water source.
Advise Authorities if spillage has entered watercourse or sewer or has contaminated soil or vegetation.

Disposal
Dispose in accordance with all local, state (provincial), and federal regulations. Under RCRA, it is the responsibility of the product’s user to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because the product uses, transformations, mixtures, processes, etc. may render the resulting materials hazardous.
Do not remove label until container is thoroughly cleaned. Empty containers may contain hazardous residues. This material and its container must be disposed of in a safe way.

14. TRANSPORT INFORMATION

DOT
Not regulated for transport

IMO/IMDG
Not regulated (Not dangerous for transport)

Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations

15. REGULATORY INFORMATION

SARA TITLE III: Section 311/312 Categorizations (40CFR370): Immediate health hazard
SARA TITLE III: Section 313 Information (40CFR372)
This product does not contain a chemical which is listed in Section 313 at or above de minimis concentrations.

US. Toxic Substances Control Act (TSCA): All components of this product are in compliance with the inventory listing requirements of the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

California (Proposition 65)
This product does not contain materials which the State of California has found to cause cancer, birth defects or other reproductive harm.

16. OTHER INFORMATION

Hazard Rating

<table>
<thead>
<tr>
<th></th>
<th>Health</th>
<th>Fire</th>
<th>Reactivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>NFPA</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
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Legend

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>ACGIH</td>
<td>American Conference of Governmental Industrial Hygienists</td>
</tr>
<tr>
<td>BAc</td>
<td>Butyl acetate</td>
</tr>
<tr>
<td>OSHA</td>
<td>Occupational Safety and Health Administration</td>
</tr>
<tr>
<td>PEL</td>
<td>Permissible Exposure Limit</td>
</tr>
<tr>
<td>STEL</td>
<td>Short Term Exposure Limit (STEL):</td>
</tr>
<tr>
<td>TLV</td>
<td>Threshold Limit Value</td>
</tr>
<tr>
<td>TWA</td>
<td>Time Weighted Average (TWA):</td>
</tr>
</tbody>
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| | Bar denotes a revision from prior MSDS. |

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