1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Code 40870
Trade Name MICROPOSIT MF-321 DEVELOPER
Manufacturer/Supplier Shipley Company
Address 455 Forest St.
Marlborough, Massachusetts 01752
Phone Number (508) 481-7950
Emergency Phone Number (508) 481-7950
Chemtrec # (800) 424-9300
MSDS first issued 8 July 1996
MSDS data revised 10 May 1999
Prepared By: Gregory S. Dripps
Local Sales Company Shipley Company, 455 Forest Street, Marlboro, MA 01752 (508-481-7950)

2. COMPOSITION/INFORMATION ON THE INGREDIENTS

Components without CAS numbers are Trade Secret
Component Name CAS# / Codes Concentration
water 7732-18-5 98.00 - 99.00
Surfactant 0.01 - 1.00
tetramethylammonium hydroxide 75-59-2 1.91

3. HAZARD IDENTIFICATION

Main Hazards - Irritant - Skin - Eye - Nervous System - Respiratory System
Routes of Entry Inhalation, ingestion, eye and skin contact, absorption.
Carcinogenic Status Not considered carcinogenic by NTP, IARC and OSHA
Target Organs - Skin - Eye - Nervous System - Respiratory System
Health Effects - Eyes Liquid, mist or vapor will cause conjunctival irritation and possibly corneal damage. Systemic effects similar to those resulting from skin contact may occur. Effects may be delayed for several hours.
Health Effects - Skin Material may cause irritation. Repeated or prolonged contact may cause chemical burns. Abnormal conditions such as prolonged contact or absorption through burns or open wounds may have the following effects: - neurotoxicity - muscle spasms -
3. HAZARD IDENTIFICATION

convulsions - death (See Section 11)

Health Effects - Ingestion
Swallowing may have the following effects:
- irritation of mouth, throat and digestive tract
- systemic effects similar to those resulting from skin contact

Health Effects - Inhalation
Exposure to vapor or mist may have the following effects:
- irritation of nose, throat and respiratory tract

4. FIRST AID MEASURES

First Aid - Eyes
Immediately flush the eye with plenty of water for at least 20 minutes, holding the eye open. Obtain medical attention immediately.

First Aid - Skin
Wash skin with water. Remove contaminated clothing as washing proceeds. Continue washing for at least 20 minutes. Obtain medical attention if blistering occurs or redness persists. Obtain medical attention if this product contacted abraided skin or open wounds.

First Aid - Ingestion
Wash out mouth with water. Do not induce vomiting. Obtain medical attention.

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

Advice to Physicians
Treat symptomatically. Support respiration and blood pressure. Control seizures. Effects believed to be reversible if hypoxia and prolonged seizures are prevented.

5. FIRE FIGHTING MEASURES

Extinguishing Media
Use water spray, foam, dry chemical or carbon dioxide.

Special Fire-Fighting Procedures
None.

Unusual Fire & Explosion Hazards
None known.

Protective Equipment for Fire-Fighting
No special fire-fighting clothing required.
6. ACCIDENTAL RELEASE MEASURES

Spill Procedures
Spills may be absorbed with appropriate absorbent material for alkaline materials.

Personal Precautions
Wear appropriate protective clothing.

Environmental Precautions
Prevent the material from entering drains or water courses.

7. HANDLING AND STORAGE

Handling
Use local exhaust ventilation. Avoid contact with eyes, skin and clothing. Keep container tightly closed when not in use.

Storage
Store in original containers. Storage area should be:
- cool
- dry
- well ventilated
- away from incompatible materials

Other
No special precautions necessary.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Standards
tetramethylammonium hydroxide
None assigned.

Engineering Control 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.

Respiratory Protection
Respiratory protection not normally required. Respiratory protection if there is a risk of uncontrolled exposure to vapor 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.

Hand Protection
Neoprene or nitrile gloves. Other chemical resistant gloves may be recommended by your safety professional.

Eye Protection
Chemical goggles.

Body Protection
Normal work wear.
9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical State</td>
<td>Liquid</td>
</tr>
<tr>
<td>Color</td>
<td>Clear</td>
</tr>
<tr>
<td>Odor</td>
<td>Amine</td>
</tr>
<tr>
<td>VOC (g/l)</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.001</td>
</tr>
<tr>
<td>pH</td>
<td>13</td>
</tr>
<tr>
<td>Boiling Range/Point (°C/F)</td>
<td>100 / 212</td>
</tr>
<tr>
<td>Flash Point (PMCC) (°C/F)</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Explosion Limits (%)</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Completely soluble.</td>
</tr>
<tr>
<td>Vapor Density (Air = 1)</td>
<td>Data not available.</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>Slower than ether</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>Equivalent to water.</td>
</tr>
</tbody>
</table>

10. STABILITY AND REACTIVITY

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stability</td>
<td>Stable under normal conditions.</td>
</tr>
<tr>
<td>Conditions to Avoid</td>
<td>- contact with incompatible materials</td>
</tr>
<tr>
<td>Incompatibilities</td>
<td>- Acids - Strong oxidizing agents</td>
</tr>
<tr>
<td>Hazardous Polymerization</td>
<td>Will not occur.</td>
</tr>
<tr>
<td>Hazardous Decomposition Products</td>
<td>- methanol - triethylamine - oxides of carbon - oxides of nitrogen</td>
</tr>
</tbody>
</table>

11. TOXICOLOGICAL INFORMATION

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Data</td>
<td>Tetramethylammonium hydroxide: 2.14% (by weight): A single 4h semi-occlusive application to intact rabbit skin produced no signs of dermal irritation. No clinical signs of toxicity were observed during a 48h observation period. Testing complied with OECD Section 404 and EPA TSCA 40 CFR Part 798 standard protocols. DOT Corrosivity testing conducted on stainless steel and laboratory animals determined that this product is not corrosive.</td>
</tr>
<tr>
<td>Chronic/Subchronic Data</td>
<td>No relevant studies identified.</td>
</tr>
<tr>
<td>Genotoxicity</td>
<td>No relevant studies identified.</td>
</tr>
</tbody>
</table>
11. TOXICOLOGICAL INFORMATION

Reproductive/Developmental Toxicity

No relevant studies identified.

Additional Data

Tetramethylammonium hydroxide:
3.5% (by weight): A single 4h semi-occlusive application to intact rabbit skin produced minimal signs of irritation (mean scores for erythema or edema less than 2). No clinical signs of toxicity were observed during a 48h observation period. Testing complied with OECD Section 404 and EPA TSCA 40 CFR Part 798 standard protocols.

5% and 7% (by weight): A single 4h semi-occlusive application to intact rabbit skin produced burns (full thickness destruction of skin). This material is corrosive. No clinical signs of toxicity were observed during a 48h observation period. Testing complied with OECD Section 404 and EPA TSCA 40 CFR Part 798 standard protocols. Corrosive to aluminum per DOT corrosivity testing.

<5% (w/v): Repeated application to rat skin for 6 h/d, 5 d/wk, for 4 weeks did not produce systemic toxicity. Test material was applied continuously through a reservoir affixed to shaved animal backs.

>=5% (w/v): Repeated application to rat skin for 6h/d,5 d/wk, for 4 weeks produced rapid systemic toxicity with the following effects:
- convulsions - death
Effects were noted after 2 hours of initial application. Test material was applied continuously through a reservoir affixed to shaved animal backs.

100% (by weight): Dermal LD50 (guinea pig) 25mg/kg.

12. ECOLOGICAL INFORMATION

Mobility

The product will dissolve rapidly in water. The product will leach into soil.

Persistence/Degradability

If neutralized, this material may be biodegradable.

Bio-accumulation

If neutralized, this material may be biodegradable.

Ecotoxicity

Do not discharge directly to surface water.
Tetramethylammonium hydroxide: A pH neutralized solution has been shown to be toxic to aquatic organisms. Tests on the following species gave a 96h LC50 of 0.07-1.2mg/litre:
12. ECOLOGICAL INFORMATION

- ceriodaphnia dubia (water flea)

13. DISPOSAL CONSIDERATIONS

<table>
<thead>
<tr>
<th>Disposal Type</th>
<th>Disposal Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Disposal</td>
<td>Do not discharge directly to surface water. Dispose of in accordance with all applicable local and national regulations.</td>
</tr>
<tr>
<td>Container Disposal</td>
<td>Labels should not be removed from containers until they have been cleaned. Empty containers may contain hazardous residues. Dispose of containers with care.</td>
</tr>
</tbody>
</table>

14. TRANSPORT INFORMATION

<table>
<thead>
<tr>
<th>DOT Ground</th>
<th>Not Regulated</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN Proper Shipping Name</td>
<td>None.</td>
</tr>
<tr>
<td>UN Class</td>
<td>None.</td>
</tr>
<tr>
<td>UN Number</td>
<td>None.</td>
</tr>
<tr>
<td>UN Packaging Group</td>
<td>None.</td>
</tr>
<tr>
<td>N.O.S. 1:</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>N.O.S. 2:</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Subsidiary Risks</td>
<td>None.</td>
</tr>
<tr>
<td>ADR/RID Substance Identification Number</td>
<td>None assigned.</td>
</tr>
<tr>
<td>CERCLA RQ</td>
<td>None.</td>
</tr>
<tr>
<td>Marine Pollutant</td>
<td>No.</td>
</tr>
</tbody>
</table>

15. REGULATORY INFORMATION

<table>
<thead>
<tr>
<th>Regulatory Type</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSCA Listed</td>
<td>All components of this product are listed on the U.S. Toxic Substances Control Act Chemical Inventory (TSCA Inventory) or are exempted from listing because a Low Volume Exemption has been granted in accordance with 40 CFR 723.50. This product is not subject to a Section 5(e) Consent Order or Significant New Use Rule (SNUR).</td>
</tr>
<tr>
<td>TSCA Exemptions</td>
<td>This product does not contain any substances subject to Section 12(b) export notification.</td>
</tr>
<tr>
<td>WHMIS Classification</td>
<td>D.2.B</td>
</tr>
<tr>
<td>MA Right To Know Law</td>
<td>All components have been checked for inclusion on the</td>
</tr>
</tbody>
</table>
15. REGULATORY INFORMATION

Massachusetts Substance List (MSL). Those components present at the de minimus concentration have been identified in the hazardous ingredients section of the MSDS.

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.

SARA TITLE III-Section 311/312 Categorization (40 CFR 370)
Immediate health hazard

SARA TITLE III-Section 313 (40 CFR 372)
This product does not contain a chemical which is listed in Section 313 at or above de minimis concentrations.

16. OTHER INFORMATION

| NFPA Rating- FIRE | 0 |
| NFPA Rating- HEALTH | 3 |
| NFPA Rating- REACTIVITY | 0 |
| NFPA Rating- SPECIAL | None. |

Revisions Highlighted
Composition/Information on the Components
Hazard Identification
First Aid Measures
Hazardous Decomposition Products
Toxicological Information
NFPA Rating-HEALTH

Abbreviations
CAS#: Chemical Abstract Services Number
ACGIH: American Conference of Governmental Industrial Hygienists
OSHA: Occupational Safety and Health Administration
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
STEL: Short Term Exposure Limit
NTP: National Toxicology Program
IARC: International Agency for Research on Cancer
R: Risk
S: Safety
LD50: Lethal Dose 50%
LC50: Lethal Concentration 50%
BOD: Biological Oxygen Demand
TLM: Median Tolerance Limit

Disclaimer
The data contained herein is based on information that Shipley Company believes to be reliable, but
16. OTHER INFORMATION

no expressed or implied warranty is made with regard to the accuracy of such data or its suitability for a given situation. Such data relates only to the specific product described and not to such products in combination with any other product and no agent of Shipley Company is authorized to vary any of such data. Shipley Company and its agents disclaim all liability for any action taken or foregone on reliance upon such data.