1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

   Product Code       40860
   Trade Name         MICROPOSIT MF-322 DEVELOPER
   Manufacturer/Supplier Shipley Company
   Address            455 Forest St.
                        Marlborough, Massachusetts 01752
   Phone Number       (508) 481-7860
   Emergency Phone Number (508) 481-7850
   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
                        (508-481-7850)

2. COMPOSITION/INFORMATION ON THE INGREDIENTS

   Components without CAS numbers are Trade Secret

<table>
<thead>
<tr>
<th>Component Name</th>
<th>CAS# / Codes</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>water</td>
<td>7732-18-5</td>
<td>97.00 - 98.00</td>
</tr>
<tr>
<td>tetramethylammonium hydroxide</td>
<td>76-69-2</td>
<td>2.44</td>
</tr>
<tr>
<td>Surfactant</td>
<td></td>
<td>0.01 - 1.80</td>
</tr>
</tbody>
</table>

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 - 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 abraded 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
   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

Physical State
Liquid

Color
Clear

Odor
Amine

VOC (g/l)
Not applicable.

Specific Gravity
1.001

pH
13

Boiling Range/Point (°C/F)
100 / 212

Flash Point (PMCC) (°C/F)
Not applicable.

Explosion Limits (%)
Not applicable.

Solubility in Water
Completely soluble.

Vapor Density (Air = 1)
Data not available.

Evaporation Rate
Slower than other

Vapor Pressure
Equivalent to water.

10. STABILITY AND REACTIVITY

Stability
Stable under normal conditions.

Conditions to Avoid
- contact with incompatible materials

Incompatibilities
- Acids - Strong oxidizing agents

Hazardous Polymerization
Will not occur.

Hazardous Decomposition Products
- methanol - triethylamine - oxides of nitrogen - oxides of carbon

11. TOXICOLOGICAL INFORMATION

Acute Data
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.

Chronic/Subchronic Data
No relevant studies identified.

Genotoxicity
No relevant studies identified.

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/Degradaibility
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:
- ceriodaphnia dubia (water flea)

13. DISPOSAL CONSIDERATIONS

Product Disposal
Do not discharge directly to surface water. Dispose of in accordance with all applicable local and national regulations.

Container Disposal
Labels should not be removed from containers until they have been cleaned. Empty containers may contain hazardous residues. Dispose of containers with care.

14. TRANSPORT INFORMATION

DOT Ground:
Not Regulated

UN Proper Shipping Name
None.

UN Class
None.

UN Number
None.

UN Packaging Group
None.

N.O.S. 1:
Not applicable.

N.O.S. 2:
Not applicable.

Subsidiary Risks
None.

ADR/RID Substance Identification Number
None assigned.
15. REGULATORY INFORMATION

**TSCA Listed**
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).

**TSCA Exemptions**
TSCA Sec.12(b) Export Notification
This product does not contain any substances subject to Section 12(b) export notification.

**WHMIS Classification**
D2.B

**MA Right To Know Law**
All components have been checked for inclusion on the 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

**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 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.