1. PRODUCT AND COMPANY IDENTIFICATION

MICROPOSIT™ 351 DEVELOPER

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>85.0 - 95.0 %</td>
</tr>
<tr>
<td>Sodium hydroxide</td>
<td>1310-73-2</td>
<td>1.0 - 5.0 %</td>
</tr>
<tr>
<td>sodium tetraborate decahydrate</td>
<td>1303-96-4</td>
<td>1.0 - 10.0 %</td>
</tr>
<tr>
<td>Inorganic Borates</td>
<td></td>
<td>&lt; 1.0 %</td>
</tr>
</tbody>
</table>

3. HAZARDS IDENTIFICATION

Emergency Overview
Appearance
Form liquid
Colour colourless
**Hazard Summary**

**DANGER!**

Corrosive alkaline liquid and vapor.
Causes severe burns.
Onset of symptoms may be delayed.

**Potential Health Effects**

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

**Eyes:** Will cause severe conjunctival irritation, corneal damage, and may result in loss of vision.

**Skin:** Material will cause chemical burns.

**Ingestion:** Swallowing may have the following effects:
- corrosion of mouth, throat and digestive tract

**Inhalation:** Inhalation may have the following effects:
- severe irritation of nose, throat and respiratory tract
- Higher concentrations may have the following effects:
  - severe irritation to nose, throat and respiratory tract and possibly lung damage

**Target Organs:** Eye
Respiratory System
Skin

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

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### 4. FIRST AID MEASURES

**Inhalation:** Remove from exposure. If there is difficulty in breathing, give oxygen. Immediate medical attention is required.

**Skin contact:** Immediately flush the skin with large quantities of water, preferably under a shower. If skin contact occurs, remove contaminated clothing and wash skin thoroughly. Continue washing for at least 20 minutes. Contaminated clothing should be washed or dry-cleaned before re-use. Immediate medical attention is required.

**Eye contact:** Immediately flush the eye with plenty of water for at least 20 minutes, holding the eye open. Immediate medical attention is required.

**Ingestion:** Do NOT induce vomiting. 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. Treat skin burns conventionally.

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### 5. FIRE-FIGHTING MEASURES

**Flash point**
- not applicable

**Suitable extinguishing media:** Use water spray, foam, dry chemical or carbon dioxide.

**Specific hazards during fire fighting:** This product may give rise to hazardous vapors in a fire.

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

**Further information:** May emit corrosive vapor or mist.
6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Wear suitable protective clothing.
Wear respiratory protection.
Material can create slippery conditions.

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
Spills may be absorbed with appropriate absorbent material for alkaline materials.
Transfer into suitable containers for recovery or disposal.

7. HANDLING AND STORAGE

Handling
Use local exhaust ventilation. Avoid contact with eyes, skin and clothing. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Avoid breathing vapor. Keep container tightly closed.

Storage
Storage conditions: Store in original container. Storage area should be: cool dry well ventilated out of direct sunlight away from incompatible materials
Further information on storage conditions: Practice good personal hygiene to prevent accidental exposure.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limit(s)
Exposure limits are listed below, if they exist.

<table>
<thead>
<tr>
<th>Component</th>
<th>Regulation</th>
<th>Type of listing</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium hydroxide</td>
<td>Rohm and Haas</td>
<td>TLV-C</td>
<td>0.2 mg/m³</td>
</tr>
<tr>
<td></td>
<td>ACGIH</td>
<td>Ceiling</td>
<td>2 mg/m³</td>
</tr>
<tr>
<td></td>
<td>NIOSH/GUIDE</td>
<td>Ceiling</td>
<td>2 mg/m³</td>
</tr>
<tr>
<td></td>
<td>OSHA_TRANS</td>
<td>PEL</td>
<td>2 mg/m³</td>
</tr>
<tr>
<td></td>
<td>Z1A</td>
<td>Ceiling</td>
<td>2 mg/m³</td>
</tr>
</tbody>
</table>

Exposure controls
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.

Individual protection measures
Eye/face protection: Chemical goggles and face shield.
Skin protection
Hand protection: Neoprene gloves. Other chemical resistant gloves may be recommended by your safety professional. Gauntlet sleeves.
Other protection: rubber or neoprene apron
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.
9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form		liquid
Colour		colourless
pH		> 12
Melting point/range	0 °C (32 °F)
Boiling point/boiling range	> 100 °C (> 212 °F)
Flash point	not applicable
Vapour pressure	2.3 hPa at 20 °C (68 °F)
Relative vapour density
Relative density	1.00
Water solubility	Miscible
VOC’s	0 g/l

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.
Hazardous decomposition products	None known.
Polymerisation	Will not occur.

11. TOXICOLOGICAL INFORMATION

Toxicological information on this product or its components appear in this section when such data is available.
Component: Water
Acute oral toxicity	> 6,000.000000 mg/kg

Component: Sodium hydroxide
Acute oral toxicity	LD50 rabbit 325 mg/kg

Component: sodium tetraborate decahydrate
Acute oral toxicity	LD50 rat male 4,500 mg/kg

Component: Inorganic Borates
Acute oral toxicity	LD50 rat 2,660 mg/kg

Component: Water
Acute inhalation toxicity  > 40,000.000000 mg/l

Component: Water
  Acute dermal toxicity  > 6,000.000000 mg/kg

Component: Sodium hydroxide
  Acute dermal toxicity  LD50 rabbit  1,350 mg/kg

Component: sodium tetraborate decahydrate
  Acute dermal toxicity  LD50 rat  > 5,000 mg/kg

Component: Inorganic Borates
  Acute dermal toxicity  LD50 rabbit  > 2,000 mg/kg

Component: Sodium hydroxide
  Skin irritation  Corrosive

Component: sodium tetraborate decahydrate
  Skin irritation  rabbit No skin irritation

Component: Inorganic Borates
  Skin irritation  rabbit 24 h slight irritation

Component: Sodium hydroxide
  Eye irritation  rabbit Corrosive

Component: sodium tetraborate decahydrate
  Eye irritation  rabbit Severe eye irritation

Component: Inorganic Borates
  Eye irritation  rabbit 24 h slight irritation

Component: sodium tetraborate decahydrate
  Subchronic toxicity  Reproductive System

Component: sodium tetraborate decahydrate
  Reproductive toxicity
  Adverse effects on the male reproductive system have been reported in laboratory animals following repeated exposure.

Component: sodium tetraborate decahydrate
  Teratogenicity
  Developmental effects were seen in laboratory animals only at dose levels that were maternally toxic.

Component: Inorganic Borates
  Reproductive toxicity
  Adverse effects on the male reproductive system have been reported in laboratory animals following repeated exposure.

Component: Inorganic Borates
  Teratogenicity
  Developmental effects were seen in laboratory animals only at dose levels that were maternally toxic.

12. ECOLOGICAL INFORMATION

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

Sodium hydroxide
<table>
<thead>
<tr>
<th>Ecotoxicity effects</th>
<th>Toxicity to fish</th>
<th>LC50 Mosquito fish (Gambusia affinis) 96 h 125 mg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxicity to aquatic invertebrates</td>
<td>LC50 ceriodaphnia dubia (water flea) 48 h 40 mg/l</td>
<td></td>
</tr>
</tbody>
</table>

**sodium tetraborate decahydrate**

<table>
<thead>
<tr>
<th>Ecotoxicity effects</th>
<th>Toxicity to fish</th>
<th>LC50 Rainbow trout (Oncorhynchus mykiss) 96 h Method Not Specified  &gt;1,100 mg/l Boron</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxicity to fish</td>
<td>LC50 Bluegill sunfish (Lepomis macrochirus) 96 h</td>
<td>&gt;1,021 mg/l Boron</td>
</tr>
<tr>
<td>Toxicity to fish</td>
<td>LC50 Rainbow trout (Oncorhynchus mykiss) 672 h</td>
<td>&gt;126 mg/l Boron</td>
</tr>
</tbody>
</table>

**Toxicity to algae**

<table>
<thead>
<tr>
<th>Toxicity to algae</th>
<th>EC50 Algae (Scenedesmus subspicatus) 72 h OECD Test Guideline Method Not Specified 34 mg/l The Environmental Toxicity data are for a compositionally similar material Boron</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxicity to algae</td>
<td>EC50 Algae (Scenedesmus subspicatus) 96 h OECD Test Guideline Method Not Specified 158 mg/l The Environmental Toxicity data are for a compositionally similar material. Boron</td>
</tr>
</tbody>
</table>

**Toxicity to aquatic invertebrates**

<table>
<thead>
<tr>
<th>Toxicity to aquatic invertebrates</th>
<th>LC50 Daphnia magna (Water flea) 48 h Method Not Specified 141 mg/l Boron</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxicity to aquatic invertebrates</td>
<td>LC50 Daphnia magna (Water flea) 504 h Method Not Specified 52.2 mg/l Boron</td>
</tr>
</tbody>
</table>

**Toxicity to aquatic invertebrates**

| Toxicity to aquatic invertebrates           | Reproduction Test NOEC Daphnia magna (Water flea) 504 h Method Not Specified 6.4 mg/l Boron |

**Inorganic Borates**

**Elimination information (persistence and degradability)**

| Biodegradability                           | No applicable data.                                                |

| Bioaccumulation                            | Fish                                                              |

| Ecotoxicity effects                         |                                                                     |
Toxicity to fish
LC50 Rainbow trout (Salmo gairdneri) 96 h
>1,100 mg/l
Boron

Toxicity to fish
LC50 Bluegill sunfish (Lepomis macrochirus) 96 h
>1,021 mg/l
Boron

Toxicity to fish
LC50 Rainbow trout (Salmo gairdneri) 768 h
138 mg/l
Boron

Toxicity to algae
EC50 Algae (Scenedesmus subspicatus) 72 h Method Not Specified
34 mg/l
Boron

Toxicity to aquatic invertebrates
LC50 Daphnia magna (Water flea) 48 h
133 mg/l
Boron

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**

<table>
<thead>
<tr>
<th>Proper shipping name</th>
<th>Sodium hydroxide solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN number</td>
<td>UN 1824</td>
</tr>
<tr>
<td>Class</td>
<td>8</td>
</tr>
<tr>
<td>Packing group</td>
<td>II</td>
</tr>
<tr>
<td>Reportable Quantity</td>
<td>Sodium hydroxide</td>
</tr>
</tbody>
</table>

**IMO/IMDG**

<table>
<thead>
<tr>
<th>Proper shipping name</th>
<th>SODIUM HYDROXIDE SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN number</td>
<td>UN 1824</td>
</tr>
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<td>Sodium hydroxide</td>
</tr>
</tbody>
</table>

*Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations*
15. REGULATORY INFORMATION

Workplace Classification
OSHA: Corrosive
WHMIS: This product is a ‘controlled product’ under the Canadian Workplace Hazardous Materials Information System (WHMIS).

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

NFPA Hazard Rating

<table>
<thead>
<tr>
<th>Health</th>
<th>Fire</th>
<th>Reactivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Legend

<table>
<thead>
<tr>
<th>ACGIH</th>
<th>American Conference of Governmental Industrial Hygienists</th>
</tr>
</thead>
<tbody>
<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>
</table>

| Bar denotes a revision from prior MSDS. |

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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