1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Code: 41200
Trade Name: MICROPOSIT S1805 PHOTO RESIST
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: 2 July 1996
MSDS data revised: 11 June 1998
Prepared By: Amy C. Nichols
Local Sales Company: Shipley Company, 455 Forest Street, Marlboro, MA 01752
(508-481-7950)

2. COMPOSITION/INFORMATION ON THE INGREDIENTS

Components in Product

<table>
<thead>
<tr>
<th>Component Name</th>
<th>CAS# / Codes</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diazo Photoactive Compound</td>
<td></td>
<td>1.00 - 10.00</td>
</tr>
<tr>
<td>Fluoroaliphatic Polymer Esters</td>
<td>0.01 - 1.00</td>
<td></td>
</tr>
<tr>
<td>Mixed cresol novolak resin</td>
<td>10.00 - 20.00</td>
<td></td>
</tr>
<tr>
<td>Electronic grade propylene glycol monomethyl ether succinate</td>
<td>108-65-6</td>
<td>81.00 - 86.00</td>
</tr>
<tr>
<td>cresol</td>
<td>1310-77-3</td>
<td>0.01 - 0.99</td>
</tr>
</tbody>
</table>

3. HAZARD IDENTIFICATION

Main Hazards: - Irritant - Combustible - Nervous System - Skin - Eye - Kidney - Liver
Routes of Entry: Inhalation, ingestion, eye and skin contact, absorption.
Carcinogenic Status: Not considered carcinogenic by NTP, IARC and OSHA
Target Organ: Nervous System - Skin - Eye - Liver - Kidney
Health Effects - Eyes: Liquid or vapor may cause pain, transient irritation and superficial corneal effects.
Health Effects - Skin: Material may cause slight irritation on prolonged or repeated contact. Repeated and/or prolonged contact may lead to: - drowsiness - liver damage - kidney damage
Health Effects - Ingestion: A large dose may have the following effects: - drowsiness - liver damage - kidney damage
Health Effects - Inhalation: Exposure to vapor at high concentrations may have the following effects: - irritation of nose, throat and respiratory tract - liver damage - kidney damage

4. FIRST AID MEASURES

First Aid - Eyes: 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.
First Aid - Skin: Wash skin with water. Obtain medical attention if blistering occurs or redness persists.
First Aid - Ingestion: Wash out mouth with water. 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.

5. FIRE FIGHTING MEASURES

Extinguishing Media: Use water spray, foam, dry chemical or carbon dioxide. Keep containers and surroundings cool with water spray.
Special Fire-Fighting Procedures: This product may give rise to hazardous vapors in a fire. Vapors can travel a considerable distance to a source of ignition and result in flashback.
Unusual Fire & Explosion Hazards: Pressure may build up in closed containers with possible liberation of combustible vapors.
Protective Equipment for Fire-Fighting: Wear full protective clothing and self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

Spill Procedures: Contain and absorb using earth, sand or other inert material. Transfer into suitable containers for recovery or disposal. Finally flush area with plenty of water.
Personal Precautions: Wear appropriate protective clothing. Wear respiratory protection. Eliminate all sources of ignition.
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. Store away from sources of heat or ignition. Storage area should be:
- cool - dry - well ventilated - out of direct sunlight

Other: Proprietary photosensitizing film contains approximately 2-4% of 2,3,4-trihydroxybenzophenone (THBP), which may sublime during soft bake or hard bake processing. THBP has low acute toxicity (LD50>5g/kg). Contact with eyes, skin or mucous membranes cause irritation.

To prevent accumulation of THBP on equipment surfaces and ventilation ducts, preventative maintenance program including regular cleaning should be implemented. Wipe surfaces using an appropriate cleaning solvent when possible. Provide adequate general or local exhaust ventilation during the cleaning process. In situations where this is not possible or where solvent or dust concentrations become excessive, use an air purifying respirator with an organic vapor toxic particulate cartridge. When clearing residual THBP, wear protective gloves and adequate protective clothing to prevent skin contact. Practice good personal hygiene to prevent accidental exposure. Clean all protective clothing and equipment thoroughly after each use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Standards
Electronic grade propylene glycol monomethyl ether acetate

Manufacturer recommends 30ppm 8h TWA and 90ppm 15 min STEL.

Cresol

ACGIH: TLV 5ppm (22mg/m3) 8h TWA. OSHA: PEL 5ppm (22mg/m3) 8h TWA. UK EH40: OES 5ppm (22mg/m3) 8h TWA. Can be absorbed through skin.

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 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.

Hand Protection

Butyl rubber gloves.

Eye Protection

Chemical goggles.

Body Protection

Normal work wear.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State
Viscous liquid

Color
Red

Odor
Sweet

VOC (g/l)
839.80

Specific Gravity
1.010

pH
Neutral

Boiling Range-Point (°C/F)
145.8/295

Flash Point (PMCC) (°C/F)
40.5-46.1 / 105-115

Explosion Limits (%)
Lower limit 1.5 at 20 °C. Upper limit 7.0 at 20 C.

Solubility in Water
Insoluble.

Vapor Density (Air = 1)
Heavier than air.

Evaporation Rate
Slower than ether

Vapor Pressure
Propylene Glycol Monomethyl Ether Acetate: 3.7 mmHg at 20 °C.

10. STABILITY AND REACTIVITY

Stability
Stable under normal conditions.

Conditions to Avoid
- High temperatures - Static discharge

Incompatibilities
- Oxidizing agents

Hazardous Polymerization
Will not occur.

11. TOXICOLOGICAL INFORMATION

Acute Data
Propylene Glycol Monomethyl Ether Acetate: Oral LD50 (rat) 8532mg/kg. Dermal LD50 (rabbit) 5000mg/kg.

Chronic/Subchronic Data
No data.

Genotoxicity
It was not mutagenic when tested in bacterial or mammalian systems.

Reproductive/Developmental Toxicity
Developmental effects were seen in laboratory animals only at dose levels that were maternally toxic.

12. ECOLOGICAL INFORMATION

Mobility
Propylene Glycol Monomethyl Ether Acetate: Koc is 0 - 50.

Persistence/Degradability
The product is partially or slowly biodegradable. BOD20 greater than 40%

Bio-accumulation
No data.

Ecotoxicity
The product is rated as practically non-toxic to aquatic species. Tests on the following species gave a LC50 of 161mg/litre: - fathead minnows

Tests on the following species gave a LC50 of 408mg/litre: - daphnia

13. DISPOSAL CONSIDERATIONS

Product Disposal
Incorporation is the recommended method of disposal. 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 per 49 CFR 173.150(f)(2)

UN Proper Shipping Name
Flammable liquid, n.o.s.

UN Class
(3) Flammable Liquid

UN Number
UN1993

UN Packaging Group
III

N.O.S. 1:
Propylene Glycol Monomethyl Ether Acetate

N.O.S. 2:

Subsidiary Risks
None.

ADR/RID Substance Identification Number
CLASS 3 - 31(c)

CERCLA RQ
Cresol (100#)

Marine Pollutant
No.

15. REGULATORY INFORMATION

TSCA Listed
Yes

TSCA Exemptions

WHMIS Classification
D.2.B 8.3

MA Right To Know Law
All components have been checked for inclusion on the Massachusetts Substance List (MSIL). 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, delayed, flammability 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

<table>
<thead>
<tr>
<th>NFPA Rating- FIRE</th>
<th>2</th>
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</thead>
<tbody>
<tr>
<td>NFPA Rating- HEALTH</td>
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</tr>
<tr>
<td>NFPA Rating- REACTIVITY</td>
<td>0</td>
</tr>
<tr>
<td>NFPA Rating- SPECIAL</td>
<td>None</td>
</tr>
<tr>
<td>Revisions Highlighted</td>
<td>Flash Point (PMCC) (°C/F)</td>
</tr>
<tr>
<td>Abbreviations</td>
<td>CAS#: Chemical Abstract Services Number</td>
</tr>
<tr>
<td></td>
<td>ACGIH: American Conference of Governmental Industrial Hygienists</td>
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<tr>
<td></td>
<td>OSHA: Occupational Safety and Health Administration</td>
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<tr>
<td></td>
<td>TLV: Threshold Limit Value</td>
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<tr>
<td></td>
<td>PEL: Permissible Exposure Limit</td>
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<td></td>
<td>STEL: Short Term Exposure Limit</td>
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<tr>
<td></td>
<td>NTP: National Toxicology Program</td>
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<tr>
<td></td>
<td>IARC: International Agency for Research on Cancer</td>
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<tr>
<td></td>
<td>R: Risk</td>
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<tr>
<td></td>
<td>S: Safety</td>
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<tr>
<td></td>
<td>LD50: Lethal Dose 50%</td>
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<tr>
<td></td>
<td>LC50: Lethal Concentration 50%</td>
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<tr>
<td></td>
<td>BOD: Biological Oxygen Demand</td>
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<tr>
<td></td>
<td>Koc: Soil Organic Carbon Partition Coefficient</td>
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<tr>
<td></td>
<td>TLm: Median Tolerance Limit</td>
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</tbody>
</table>

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.