1. Identification

Material name OIR 620-10
Issue date 25-August-2014
Revision date -
Supersedes date -
Other means of identification
Spec ID 100000000216
Synonyms None.
Recommended use Positive photoresist.
Recommended restrictions None known.
Supplier information
FUJIFILM Electronic Materials U.S.A., Inc.
80 Circuit Drive
North Kingstown RI 02852
Transportation Emergency:
FOR ALL TRANSPORTATION ACCIDENTS, CALL CHEMTREC: 1-800-424-9300
Medical Emergency (24HR):
FOR ANY HEALTH & MEDICAL EMERGENCY, 24 HOURS /7 DAYS CALL:
1-800-365-8951
Non-emergency Telephone:
FOR ALL SDS REQUESTS & QUESTIONS, CALL CUSTOMER SERVICE:
1-800-553-6546

SDS file 11836_US_EN_V1.0
Replaces file None

2. Hazard(s) identification

Physical hazards
Flammable Liquids Category 3
Health Hazards
Serious eye damage/eye irritation Category 1
Specific Target Organ Toxicity, Single Exposure Category 3 respiratory tract irritation

OSHA defined hazards Not classified.

Label elements

Signal word Danger
Hazard statement Flammable liquid and vapor. Causes serious eye damage. May cause respiratory irritation.
Precautionary statement


Response If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center/doctor. If inhaled: Remove person to fresh air and keep comfortable for breathing. Call a poison center/doctor if you feel unwell. In case of fire: Use foam, carbon dioxide, dry powder or water fog for extinction.

Storage Store in a well-ventilated place. Keep cool. Keep container tightly closed. Store locked up.
Disposal Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified (HNOC) None known.
3. Composition/information on ingredients

<table>
<thead>
<tr>
<th>Mixture</th>
<th>Chemical name</th>
<th>Common name and synonyms</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ethyl-(S)-lactate</td>
<td></td>
<td>687-47-8</td>
<td>60-70</td>
</tr>
<tr>
<td></td>
<td>Ethyl 3-ethoxypropionate</td>
<td></td>
<td>763-69-9</td>
<td>10-15</td>
</tr>
<tr>
<td></td>
<td>Naphthoquinone diazide ester derivative</td>
<td></td>
<td>Proprietary</td>
<td>2-5</td>
</tr>
<tr>
<td></td>
<td>Substituted phenol</td>
<td></td>
<td>Proprietary</td>
<td>1-5</td>
</tr>
</tbody>
</table>

Composition comments
All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume. The product contains: Novolak polymer, reaction products with naphthoquinone diazide ester. Novolac resin.

4. First-aid measures

Inhalation
Move injured person into fresh air and keep person calm under observation. Get medical attention if any discomfort continues.

Skin contact
Remove contaminated clothes and rinse skin thoroughly with water for at least 15 minutes. Get medical attention if irritation develops and persists.

Eye contact
Immediately flush with plenty of water for at least 15 minutes. Remove any contact lenses and open eyelids wide apart. Get medical attention immediately. Continue to rinse.

Ingestion
Rinse mouth thoroughly with water and give large amounts of milk or water to people not unconscious. Only induce vomiting at the instruction of medical personnel. Get medical attention if any discomfort continues.

Most important symptoms/effects, acute and delayed
Inhalation: Vapors may cause drowsiness and dizziness. Eye contact: Can cause corneal opacity. Skin contact: Defats the skin.

Indication of immediate medical attention and special treatment needed
Treat symptomatically.

General information
Thermal burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital.

5. Fire-fighting measures

Suitable extinguishing media
The product is flammable, and heating may generate vapors which may form explosive vapor/air mixtures. Extinguish with foam, carbon dioxide, dry powder or water fog.

Unsuitable extinguishing media
None.

Specific hazards arising from the chemical
During fire, gases hazardous to health may be formed. Solvent vapors may form explosive mixtures with air.

Special protective equipment and precautions for firefighters
Selection of respiratory protection for firefighting: follow the general fire precautions indicated in the workplace. Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Fire fighting equipment/instructions
Use standard firefighting procedures and consider the hazards of other involved materials. Containers close to fire should be removed immediately or cooled with water.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures
Extinguish all ignition sources. Avoid sparks, flames, heat and smoking. Ventilate the area. Avoid inhalation of vapors/spray and contact with skin and eyes. Wear suitable protective clothing. See Section 8 of the SDS for Personal Protective Equipment.

Methods and materials for containment and cleaning up
Remove sources of ignition. Absorb spillage with non-combustible, absorbent material. For waste disposal, see Section 13 of the SDS.

Environmental precautions
Avoid discharge into drains, water courses or onto the ground unless authorized by permit.

7. Handling and storage

Precautions for safe handling
Local exhaust is recommended. Avoid inhalation of vapors and spray mist and contact with skin and eyes. Wear approved safety goggles. Wear protective gloves and appropriate clothing to prevent skin contact. The product is flammable, and heating may generate vapors which may form explosive vapor/air mixtures. Do not smoke and do not spray near an open flame or other sources of ignition. Vapors are heavier than air and may travel along the floor and in the bottom of containers. Vapors may be ignited by a spark, a hot surface or an ember. Take precautionary measures against static discharges. Observe good industrial hygiene practices.
Conditions for safe storage, including any incompatibilities
Follow rules for flammable liquids. Keep away from heat, sparks and open flame. Do not store near heat sources or expose to high temperatures. Store in closed original container in a dry place. Store away from incompatible materials.

8. Exposure controls/personal protection
Occupational exposure limits
No exposure limits noted for ingredient(s).
Biological limit values
No biological exposure limits noted for the ingredient(s).
Appropriate engineering controls
Use explosion-proof equipment. Provide adequate ventilation. Provide easy access to water supply or an emergency shower.
Individual protection measures, such as personal protective equipment
Eye/face protection
Wear approved safety goggles.
Skin protection
Hand protection
Wear protective gloves impervious to the chemicals in use.
Other
Also wear appropriate clothing to prevent any possibility of skin contact. Suitable items can be recommended by the protective equipment supplier or by a qualified industrial hygienist.
Respiratory protection
If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. In the United States of America, if respirators are used, a program should be instituted to assure compliance with OSHA Standard 1910.134. Use a NIOSH/MSHA approved air purifying respirator as needed to control exposure. Consult with respirator manufacturer to determine respirator selection, use, and limitations. Use positive pressure, air-supplied respirator for uncontrolled releases or when air purifying respirator limitations may be exceeded. Follow respirator protection program requirements (OSHA 1910.134 and ANSI Z88.2) for all respirator use.
Thermal hazards
Wear appropriate thermal protective clothing, when necessary.
General hygiene considerations
Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties
Appearance
Physical state
Liquid.
Form
Liquid.
Color
Yellow-red.
Odor
Mild, ester-like.
Odor threshold
No data available.
pH
Not applicable.
Melting point/freezing point
No data available.
Initial boiling point and boiling range
309.2 °F (154 °C) (Solvent) estimated
Flash point
131.0 °F (55.0 °C) (Solvent) estimated
Evaporation rate
No data available.
Flammability (solid, gas)
Not available.
Upper/lower flammability or explosive limits
Flammability limit - lower (%)
No data available.
Flammability limit - upper (%)
No data available.
Vapor pressure
No data available.
Vapor density
> 1 Heavier than air. Vapors that evolve from this product will tend to settle and accumulate near the floor.
Relative density
1.06 (25°C) (Approximate)
Solubility(ies)
Solubility (water)
Slightly soluble in water.
Partition coefficient (n-octanol/water)
No data available.
Auto-ignition temperature
No data available.
Decomposition temperature
No data available.
Viscosity
No data available.
Other information

- Density: 1.06 g/cm³ (25°C) (Approximate)
- Molecular weight: Not applicable/mixture.
- Percent volatile: 65 - 80 %

10. Stability and reactivity

- **Chemical stability**: Stable under normal temperature conditions.
- **Possibility of hazardous reactions**: Will not occur.
- **Conditions to avoid**: Heat, sparks, flames.
- **Incompatible materials**: Strong oxidizing agents. Strong bases.
- **Hazardous decomposition products**: At elevated temperatures: Carbon dioxide. Carbon monoxide. Sulfur oxides.

11. Toxicological information

Information on likely routes of exposure

- **Inhalation**: May cause respiratory irritation. In high concentrations, vapors are narcotic and may cause headache, fatigue, dizziness and nausea.
- **Skin contact**: May cause skin irritation.
- **Eye contact**: Causes serious eye damage.
- **Ingestion**: May cause discomfort if swallowed.

Symptoms related to the physical, chemical and toxicological characteristics

- Inhalation: Vapors may cause drowsiness and dizziness. Eye contact: Can cause corneal opacity. Skin contact: Defats the skin.

Information on toxicological effects

Acute toxicity

<table>
<thead>
<tr>
<th>Components</th>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethyl 3-ethoxypropionate (CAS 763-69-9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Acute</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dermal</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Rabbit</td>
<td>4076 mg/kg</td>
</tr>
<tr>
<td><strong>Inhalation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LC50</td>
<td>Rat</td>
<td>&gt; 1000 ppm</td>
</tr>
<tr>
<td><strong>Oral</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Rat</td>
<td>5000 mg/kg</td>
</tr>
<tr>
<td>Ethyl-(S)-lactate (CAS 687-47-8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Acute</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Inhalation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LC50</td>
<td>Rat</td>
<td>&gt; 5.4 mg/l, 4 Hours</td>
</tr>
<tr>
<td><strong>Oral</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Rat</td>
<td>&gt; 2000 mg/kg</td>
</tr>
<tr>
<td>Naphthoquinone diazide ester derivative (CAS Proprietary)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Acute</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dermal</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Rabbit</td>
<td>&gt; 2000 mg/kg</td>
</tr>
<tr>
<td><strong>Oral</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Rat</td>
<td>&gt; 2000 mg/kg</td>
</tr>
<tr>
<td>Substituted phenol (CAS Proprietary)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Acute</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Oral</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Rat</td>
<td>500 mg/kg</td>
</tr>
<tr>
<td>Skin corrosion/irritation</td>
<td></td>
<td>Causes skin irritation. Defats the skin. May cause skin irritation. Causes mild skin irritation.</td>
</tr>
<tr>
<td>Serious eye damage/eye irritation</td>
<td></td>
<td>Causes serious eye irritation. Causes serious eye damage.</td>
</tr>
<tr>
<td>Respiratory or skin sensitization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respiratory sensitization</td>
<td></td>
<td>No data available.</td>
</tr>
</tbody>
</table>
Skin sensitization
Not a skin sensitizer.

Germ cell mutagenicity
No data available.

Carcinogenicity
No data available.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)
Not listed.

Reproductive toxicity
No data available.

Specific target organ toxicity - single exposure
May cause respiratory irritation.

Specific target organ toxicity - repeated exposure
No data available.

Aspiration hazard
Not classified.

Chronic effects
Organic solvents may be absorbed into the body by inhalation and cause permanent damage to the nervous system, including the brain.

12. Ecological information

Ecotoxicity
The product contains a substance which is harmful to aquatic organisms. The product contains a substance which may cause long-term adverse effects in the aquatic environment.

<table>
<thead>
<tr>
<th>Components</th>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethyl 3-ethoxypropionate (CAS 763-69-9)</td>
<td>Aquatic Fish</td>
<td>LC50 Fathead minnow (Pimephales promelas) 62 - 88 mg/l</td>
</tr>
<tr>
<td>Ethyl-(S)-lactate (CAS 687-47-8)</td>
<td>Aquatic Crustacea</td>
<td>EC50 Daphnia magna 683 mg/l, 48 Hours</td>
</tr>
<tr>
<td></td>
<td>Aquatic Fish</td>
<td>LC50 Danio rerio 320 mg/l, 96 Hours</td>
</tr>
<tr>
<td>Substituted phenol (CAS Proprietary)</td>
<td>Aquatic Fish</td>
<td>LC50 Oryzias latipes &gt; 1000 mg/l, 48 hours</td>
</tr>
</tbody>
</table>

Persistence and degradability
No data available.

Bioaccumulative potential
No data available.

Mobility in soil
No data available.

Mobility in general
The product is slightly soluble in water. The product contains organic solvents which will evaporate easily from all surfaces.

Other adverse effects
The product contains volatile organic compounds which have a photochemical ozone creation potential.

13. Disposal considerations

Disposal instructions
Disposal recommendations are based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

Hazardous waste code
D001: Waste Flammable material with a flash point <140 °F

Waste from residues / unused products
Dispose of waste and residues in accordance with local authority requirements.

Contaminated packaging
Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT
UN number  UN1993
UN proper shipping name  Flammable liquid, n.o.s. (Ethyl lactate, Ethyl 3-ethoxypropionate)
Transport hazard class(es)
Class 3
Subsidiary risk -
Label(s) 3
Packing group III
Environmental hazards
Marine pollutant No

Special precautions for user
Read safety instructions, SDS and emergency procedures before handling. This material can be reclassified as a combustible liquid and is considered not regulated by ground transport when packaged in non-bulk packaging (<119 G). This exception is found in 49 CFR 173.150(f).

Special provisions
B1, B52, IB3, T4, TP1, TP29
15. Regulatory information

**US federal regulations**
This product is hazardous according to OSHA 29 CFR 1910.1200.
TSCA Section 4(a) Final Test Rules & Testing Consent Orders: Not regulated.
TSCA Section 5(e) PMN-Substance Consent Orders: Not regulated.

**Drug Enforcement Administration (DEA). List 1(i), Precursor Chemicals (21 CFR 1310.02(a) and 1310.04(f)(1))**
Not listed.

**TSCA Section 5(a)(2) Final Significant New Use Rules (SNURs)(40CFR 721, Subpt. E)**
Not regulated.

**TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)**
Substituted phenol (CAS Proprietary) 1.0 % One-Time Export Notification only.

**Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List**
Not regulated.

**CERCLA (Superfund) reportable quantity (lbs) (40 CFR 302.4)**
None

**Superfund Amendments and Reauthorization Act of 1986 (SARA)**

**Hazard categories**
Immediate Hazard - Yes
Delayed Hazard - No
Fire Hazard - Yes
Pressure Hazard - No
Reactivity Hazard - No

**Section 302 extremely hazardous substance (40 CFR 355, Appendix A)**
No

**Section 311/312 (40 CFR 370)**
Yes

**Drug Enforcement Administration (DEA) (21 CFR 1308.11-15)**
Not controlled

**Inventory status**

<table>
<thead>
<tr>
<th>Country(s) or region</th>
<th>Inventory name</th>
<th>On inventory (yes/no)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Australian Inventory of Chemical Substances (AICS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Country(s) or region</td>
<td>Inventory name</td>
<td>On inventory (yes/no)</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>--------------------------------------------------------------------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>Canada</td>
<td>Domestic Substances List (DSL)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Non-Domestic Substances List (NDSL)</td>
<td>Yes</td>
</tr>
<tr>
<td>New Zealand</td>
<td>New Zealand Inventory</td>
<td>Yes</td>
</tr>
<tr>
<td>Philippines</td>
<td>Philippine Inventory of Chemicals and Chemical Substances (PICCS)</td>
<td>Yes</td>
</tr>
<tr>
<td>United States &amp; Puerto Rico</td>
<td>Toxic Substances Control Act (TSCA) Inventory</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s)*

**State regulations**

This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

**US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT):**

- Not listed.

**US. Massachusetts RTK - Substance List**

- Ethyl-(S)-lactate (CAS 687-47-8) - Listed.

**US. New Jersey Worker and Community Right-to-Know Act**

- Ethyl-(S)-lactate (CAS 687-47-8)

**US. Pennsylvania Worker and Community Right-to-Know Law**

- Ethyl-(S)-lactate (CAS 687-47-8)

**US. Rhode Island RTK**

- Not regulated.

16. Other information, including date of preparation or last revision

**Further information**

HMIS® is a registered trade and service mark of the NPCA.

G - Safety Glasses, Gloves, Vapor Respirator

**HMIS® ratings**

- Health: 3
- Flammability: 2
- Physical hazard: 0
- Personal protection: G

**NFPA ratings**

- Health: -
- Flammability: -
- Instability: -

**Disclaimer**

THIS SAFETY DATA SHEET (SDS) IS SENT TO YOU FOR RESEARCH AND DEVELOPMENT PURPOSES ONLY. THE INFORMATION PROVIDED ON THIS SDS IS THE BEST ESTIMATE OF TECHNICALLY QUALIFIED INDIVIDUALS BUT MAY NOT BE BASED ON DIRECT TOXICOLOGY TESTING OR EXPERIENCE IN EMERGENCY SITUATIONS. THIS PRODUCT MUST BE USED BY OR UNDER THE DIRECT SUPERVISION OF TECHNICALLY QUALIFIED INDIVIDUALS. EXERCISE DUE CARE AND CONTACT FUJIFILM ELECTRONIC MATERIALS AT THE PHONE NUMBER 1-800-553-6546 (CUSTOMER SERVICE) FOR ADDITIONAL INFORMATION.

**SDS file**

11836_US_EN_V1.0

**Replaces file**

None