SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

IDENTITY
FluoroEtch® Safety Solvent

DATE PREPARED
08/03/05

SYNONYMS, CHEMICAL NAMES, COMMON NAMES
Sodium Naphthalene Complex in Glycol ether

USE:
Fluoropolymer Etchant

SUPPLIER'S NAME
Acton Technologies

EMERGENCY TELEPHONE NUMBER
CHEMTREC: 800-424-9300

ACTON TECHNOLOGIES

NORTH AMERICAN OPERATIONS
100 THOMPSON STREET • P.O. BOX 724
PITTSBURG, PENNSYLVANIA • 18640 • USA

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IRELAND

ONLINE ORDERING: www.actontech.com

AN ISO 9000 REGISTERED COMPANY

SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS

HAZARDOUS COMPONENTS

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>OSHA PEL</th>
<th>ACGIH TLV</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Methoxyethyl ether (CAS# 111-96-6)</td>
<td>None established</td>
<td>None established</td>
<td>&gt;80%</td>
</tr>
<tr>
<td>Sodium Naphthalene Complex (CAS# 7440-23-5)</td>
<td>None established</td>
<td>None established</td>
<td>&lt;20%</td>
</tr>
<tr>
<td>Sodium Naphthalene Complex (CAS# 91-29-3)</td>
<td>10 ppm TWA</td>
<td>10ppm TWA</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 ppm STEL</td>
<td></td>
</tr>
</tbody>
</table>

R 19, R 22, R 36/37/38, R 60, R 61; S 7, S 16, S 26, S 36/37/38, S 45, S 53
Remaining components, if any, are not hazardous or hazardous components are present at less than 1% (0.1% for carcinogens).

EMERGENCY OVERVIEW
Combustible liquid and vapor. May form explosive peroxides. May be irritating to skin, eyes, respiratory, and/or digestive tract. May cause skin sensitization. Reproductive hazard.

SECTION 3 - HAZARDOUS IDENTIFICATION

PRIMARY ROUTE(s) OF EXPOSURE: Inhalation; skin; eyes; ingestion.

IRRITATION DATA:
Open irritation test: Dermal (Rabbit): mild reaction @ 495 mg
Standard Draize test: Eye (Rabbit): mild @ 100 mg

Naphthalene
Naphthalene
### INHALATION

**ACUTE:**
Breathing of mists, vapors, or fumes may irritate the nose, throat, and lungs. Symptoms may include drowsiness, dizziness, headache, incoordination, difficulty breathing, blurred vision, fatigue, stomach pain, nausea, or vomiting, tremors, convulsions, loss of consciousness, cyanosis, central nervous system depression, coma, respiratory arrest and death, depending on the concentration and duration of exposure.

**CHRONIC:**
Male reproductive effects. The glycol ether solvent may be a reproductive risk for women of child bearing potential. Overexposure may lead to altered kidney function and blood abnormalities.

### SKIN CONTACT

**ACUTE:**
Skin contact may cause mild alkali burns. Can cause skin photosensitization. Harmful if absorbed through the skin.

**CHRONIC:**
May cause allergic reactions to certain individuals. Prolonged exposure can cause dermatitis.

### EYE CONTACT

**ACUTE:**
May cause irritation, pain, conjunctivitis, and possible corneal damage.

**CHRONIC:**
May cause conjunctivitis. Overexposure may lead to development of lenticular (eye) opacity and possible cataract formation.

### INGESTION

**ACUTE:**
May cause irritation of the mouth, throat, and gastrointestinal tract. May cause central nervous system depression or effects. May cause headache, pain, visual disturbance, salivation, dizziness, diarrhea, and nausea.

**CHRONIC:**
Toxic to kidneys. Overexposure may cause blood abnormalities such as hypochromia, anemia, and polynucleosis.

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**MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE**

Persons with pre-existing skin, eye or respiratory tract conditions may be at increased risk from exposure.

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### SECTION 4 - EMERGENCY AND FIRST AID PROCEDURES

**INHALATION:**
Remove from exposure to fresh air immediately. If breathing has stopped, give artificial respiration. Oxygen may be given if breathing is difficult. Get medical attention immediately.

**SKIN CONTACT:**
Remove contaminated clothing and shoes immediately. Wash affected area with soap and water until no evidence of the chemical remains. Get medical attention if irritation develops.

**EYE CONTACT:**
Flush thoroughly with water for at least 15 minutes, occasionally lifting the upper and lower lids, until no evidence of the chemical remains. Get immediate medical attention.

**INGESTION:**
Get immediate medical attention.

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### SECTION 5 - FIRE FIGHTING MEASURES

<table>
<thead>
<tr>
<th><strong>FLASH POINT</strong></th>
<th><strong>FLAMMABLE LIMITS:</strong></th>
<th><strong>LEL:</strong></th>
<th><strong>UEL:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>158 °F (Cleveland Open Cup)</td>
<td>(Glycol ether solvent)</td>
<td>1.5</td>
<td>17/4</td>
</tr>
</tbody>
</table>

**AUTOIGNITION TEMPERATURE:**
370 °F

**SENSITIVITY TO MECHANICAL IMPACT:**
Not available

**SENSITIVITY TO STATIC DISCHARGE:**
Not available

**EXTINGUISHING MEDIA:**
Dry Chemical, Alcohol Foam, Water Spray, CO2

**FIRE AND EXPLOSION HAZARDS:**
Combustible liquid. May be ignited by heat, sparks, or flames. Vapors may travel to a source of ignition and flash back. Container may explode in heat of fire.
SPECIAL FIRE FIGHTING PROCEDURES
Firefighters should wear NIOSH approved positive pressure self-contained breathing apparatus and protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS
Water will deactivate the sodium in FluoroEtch® and form a caustic solution. Solution is non-pyrophoric.

SECTION 6 - ACCIDENTAL RELEASE MEASURES
Steps to be taken if material is released or spilled:
Isolate from all ignition sources. Keep ignition sources out of the area.
Flood with water.
Neutralize with acetic or hydrochloric acid.
Absorb the solution in sand, inert absorbent, or caustic spill kit.

SECTION 7 - HANDLING AND STORAGE
FOR INDUSTRIAL USE ONLY

HANDLING
Wear protective equipment when opening container or using liquid.
Follow procedure for flammable and caustic materials.
Open cautiously to gently release any build up of pressure.
Sources of static discharge must be grounded.
Warm to room temperature prior to use.
Do not return used portions to original container.
Use with adequate ventilation.

STORAGE
Store in a cool place, away from heat, sources of ignition, and incompatibles.
Keep container tightly closed when not in use.
Avoid long exposure to the atmosphere.

SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION

RESPIRATORY PROTECTION
Where airborne concentrations may exceed guidelines for permissible air concentrations, choose a respirator in accordance with OSHA Respirator Standard 29 CFR 1910.134.

VENTILATION
Local exhaust recommended. Use protection in the absence of adequate ventilation.

PROTECTIVE GLOVES
Use impervious butyl or neoprene rubber or polyethylene gloves chosen in accordance with OSHA Personal Protective Equipment Standard 29 CFR 1910.132.

EYE PROTECTION
Use safety glasses with side shields, chemical goggles, or face shield chosen in accordance with OSHA 29 CFR 1910.133.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT
Appropriate protective clothing to minimize skin contact with this material. If conditions warrant, use butyl rubber apron and boots. Emergency eye wash fountain and shower should be available.

RECOMMENDED EXPOSURE LIMITS
The manufacturer suggest the following occupational exposure limits for the glycol ether:
5 ppm TWA: occupational exposure limit
25 ppm: short term exposure limit
For women of child bearing potential, the manufacturer recommends an occupational exposure limit of 1 ppm (8hour TWA) and a STEL of 5 ppm.
SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling Point</td>
<td>162 °C glycol ether</td>
</tr>
<tr>
<td>PH</td>
<td>Alkaline</td>
</tr>
<tr>
<td>Vapour Pressure (mm Hg)</td>
<td>1.7 @ 20 °C</td>
</tr>
<tr>
<td>Vapour Density (Air = 1)</td>
<td>4.6</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.04</td>
</tr>
<tr>
<td>Melting Point</td>
<td>-64 °C</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Evaporation Rate (Butyl acetate = 1)</td>
<td>0.36</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>~90%</td>
</tr>
<tr>
<td>Coefficient of Water/Oil Distribution</td>
<td>Not available</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>&gt;0.3ppm (naphthalene)</td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td>Green black liquid with odor of naphthalene and ether.</td>
</tr>
</tbody>
</table>

SECTION 10 - STABILITY AND REACTIVITY

<table>
<thead>
<tr>
<th>Stability</th>
<th>Conditions to Avoid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unstable</td>
<td></td>
</tr>
<tr>
<td>Stable</td>
<td>If exposed to air, organic peroxides may develop.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Incompatibility (Materials to Avoid)
Water, oxidizing materials.

Hazardous Decomposition Products
Reacts with water to form caustic soda, naphthalene, glycol ether, and peroxides. Heating to decomposition can emit acrid smoke and fumes.

Hazardous Polymerization
May Occur | Conditions to Avoid
Will Not Occur | X

SECTION 11 - TOXICOLOGICAL INFORMATION

<table>
<thead>
<tr>
<th>Endpoint</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral LD₅₀ (rat)</td>
<td>5400 mg/kg</td>
</tr>
<tr>
<td>lpr LD₅₀ (mouse)</td>
<td>4 gm/kg</td>
</tr>
<tr>
<td>Oral LD₅₀ (rat)</td>
<td>400 mg/kg</td>
</tr>
<tr>
<td>Inh LC₅₀ (rat)</td>
<td>&gt;3400 mg/m³/1H</td>
</tr>
<tr>
<td>Dermal LD₅₀ (rat)</td>
<td>&gt;2500 mg/kg</td>
</tr>
<tr>
<td>Reproductive data: RTECS</td>
<td>2-Methoxyethyl ether; Naphthalene</td>
</tr>
<tr>
<td>Mutagen data: RTECS</td>
<td>2-Methoxyethyl ether; Naphthalene</td>
</tr>
<tr>
<td>Tumorigenic data: RTECS</td>
<td>Naphthalene</td>
</tr>
</tbody>
</table>

Teratogenic effects have been demonstrated to occur causing birth defects and reversible testicular and sperm damage in some glycol ethers. A study with laboratory animals indicates that chronic alcohol (ethanol) ingestion may increase the potential for teratogenic or other toxic effects from exposure to glycol ethers and diethers. There may be a particular risk for women of child bearing potential regarding this compound. Exposure to vapors or mists should be avoided, especially for women of child bearing potential.

Skin Sensitization: Naphthalene: positive

Toxicologically synergistic materials: Chronic alcohol (ethanol) ingestion may increase the potential for teratogenic or other toxic effects from exposure to glycol ethers and diethers.

Carcinogenicity: Not listed by IARC, NTP, or ACGIH

Target Organs: Skin, eyes, digestive tract, kidney, blood, CNS, and reproductive system.
SECTION 12 - ECOLOGICAL INFORMATION

This product has not been tested for ecological impact information.

The components of this material may be considered a water pollutant and releases of this product should be prevented from contaminating soil and water and from entering drainage and sewer systems. If product is released to the environment, take immediate steps to stop and contain release. Caution should be exercised regarding personnel safety and exposure to the released product. Notify local authorities and the National Response Center, if required.

This product is not biodegradable or biodegrades very slowly in the environment.

2-Methoxyethyl ether has a fish and bacterial toxicity (LCO) of >1000 mg/L.

SECTION 13 - DISPOSAL CONSIDERATIONS

Dilute with water, neutralize with acid, filter solids.

Dispose of solids and neutralized liquid in accordance with all applicable federal, state, and local environmental regulations.

SECTION 14 - TRANSPORT INFORMATION

Dot: Not regulated
Shipping name: Not applicable
Hazard Class: Not applicable
Packing group: Not applicable

SECTION 15 - REGULATORY INFORMATION

OSHA: This material is classified as hazardous under OSHA regulations.
TSCA: All components are listed.
EINECS: All components are listed.
DSL: All components are listed.
WHMIS: This material is a B3, D2A, D2B Controlled Product. This material has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

EU:

| R 19 | May form explosive peroxides | S 7 | Keep container tightly closed |
| R 22 | Harmful if swallowed | S 16 | Keep away from sources of ignition |
| R 36/37/38 | Irritating to eyes, respiratory system, And skin | S 26 | In case of contact with eyes, rinse immediately with plenty of water and seek medical attention |
| R 60 | May impair fertility | S 36/37/38 | Wear suitable protective clothing, gloves, and eye/face protection |
| R 61 | May cause harm to the unborn child | S 53 | Avoid exposure-obtain special instructions before use. |
### SARA Title III - Toxic chemicals list 40 CFR 372.65:

<table>
<thead>
<tr>
<th>Chemical</th>
<th>CAS#</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Methoxyethyl ether</td>
<td>111-96-6</td>
<td>&gt;80%</td>
</tr>
<tr>
<td>Naphthalene</td>
<td>91-20-3</td>
<td>&lt;20%</td>
</tr>
</tbody>
</table>

### SARA HAZARD CATEGORIES:

- **Acute Health Hazard**: Yes
- **Chronic Health Hazard**: Yes
- **Fire Hazard**: Yes
- **Sudden Release of Pressure**: No
- **Reactivity**: No

### CERCLA Hazardous Substances 40 CFR 302:

<table>
<thead>
<tr>
<th>Substance</th>
<th>CAS#</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naphthalene</td>
<td>91-20-3</td>
<td>RO: 100 pounds</td>
</tr>
</tbody>
</table>

### RCRA Hazardous Waste Codes 40 CFR 261.21, 261.23:

As purchased, this material is not a RCRA hazardous waste.

### CALIFORNIA PROPOSITION 65:

This product contains the following chemicals known to the State of California to cause cancer or reproductive harm: None

### SECTION 16 - OTHER INFORMATION

<table>
<thead>
<tr>
<th>HMIS Rating</th>
<th>NFPA Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>Health</td>
</tr>
<tr>
<td>2*</td>
<td>2</td>
</tr>
<tr>
<td>Flammability</td>
<td>Flammability</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Reactivity</td>
<td>Reactivity</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Where 0 = minimal, 1 = slight, 2 = moderate, 3 = serious, 4 = severe

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