1. Identification

Product identifier
mr-UVCur06

Recommended use of the chemical and restrictions on use

Use of the substance/mixture
- photochemically curing mixture (UV Nanoimprint Lithography)
- PC 30: Photo-chemicals
- SU 16: Manufacture of computer, electronic and optical products, electrical equipment.

Uses advised against
Do not use for private purposes (household).

Details of the supplier of the safety data sheet
Company name: micro resist technology GmbH
Street: Koepenicker Str. 325
Place: D-12555 Berlin
Telephone: +49 30 641670-100  Telefax: +49 30 641670-200
e-mail: safety@microresist.de
Internet: www.microresist.de
Emergency phone number: Chemtrec (International): +1 703 527 3887

2. Hazard(s) identification

Classification of the chemical
29 CFR Part 1910.1200
Hazard categories:
- Skin corrosion/irritation: Skin Irrit. 2
- Serious eye damage/eye irritation: Eye Dam. 1
- Respiratory or skin sensitization: Skin Sens. 1

Hazard Statements:
- Causes skin irritation
- May cause an allergic skin reaction
- Causes serious eye damage

Label elements
29 CFR Part 1910.1200
Signal word: Danger

Pictograms:

Hazard statements

Precautionary statements
- Wear protective gloves/protective clothing/eye protection/face protection.
- If on skin: Wash with plenty of water.
- 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 skin irritation or rash occurs: Get medical advice/attention.
Hazard not otherwise classified

No information available.

3. Composition/information on ingredients

Mixtures

Hazardous components

<table>
<thead>
<tr>
<th>CAS No</th>
<th>Components</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1245638-61-2</td>
<td>2-propenoic acid, reaction products with pentaerythritol</td>
<td>&lt; 20 %</td>
</tr>
<tr>
<td>45127-97-7</td>
<td>2-(2-ethoxyethoxy)ethyl methacrylate</td>
<td>&lt; 10 %</td>
</tr>
<tr>
<td>68412-43-1</td>
<td>2-Propenoic acid, reaction products with pentaerythritol and TDI</td>
<td>&lt; 10 %</td>
</tr>
<tr>
<td>162881-26-7</td>
<td>phenyl bis(2,4,6-trimethylbenzoyl)-phosphine oxide</td>
<td>&lt; 1 %</td>
</tr>
</tbody>
</table>

4. First-aid measures

Description of first aid measures

After inhalation
When in doubt or if symptoms are observed, get medical advice. Provide fresh air. In case of breathing difficulties administer oxygen. If victim is at risk of losing consciousness, position and transport on their side. In case of respiratory tract irritation, consult a physician.

After contact with skin
After contact with skin, wash immediately with polyethylene glycol, followed by plenty of water. Take off immediately all contaminated clothing and wash it before reuse. Medical treatment necessary. After contact with skin, wash immediately with plenty of water and soap. Change contaminated clothing. In case of skin irritation, seek medical treatment.

After contact with eyes
After contact with the eyes, rinse with water with the eyelids open for a sufficient length of time, then consult an ophthalmologist immediately. Consult an ophthalmologist.

After ingestion
Observe risk of aspiration if vomiting occurs. Rinse mouth immediately and drink plenty of water.

Medical treatment necessary.

Most important symptoms and effects, both acute and delayed
Causes skin irritation.
Serious eye damage/eye irritation
May cause an allergic skin reaction.

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

5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media
Co-ordinate fire-fighting measures to the fire surroundings. Carbon dioxide (CO2). Dry extinguishing powder. Foam.

Unsuitable extinguishing media
High power water jet.

Specific hazards arising from the chemical
Non-flammable.
Special protective equipment and precautions for fire-fighters

Wear a self-contained breathing apparatus and chemical protective clothing.

Additional information

Suppress gases/vapours/mists with water spray jet. Collect contaminated fire extinguishing water separately.

Do not allow entering drains or surface water. In case of fire and/or explosion do not breathe fumes.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Provide adequate ventilation. Do not breathe gas/fumes/vapour/spray. Avoid contact with skin, eyes and clothes. Use personal protection equipment. Remove all sources of ignition.

Environmental precautions

Do not allow to enter into surface water or drains.

Methods and material for containment and cleaning up

Absorb with liquid-binding material (e.g. sand, diatomaceous earth, acid- or universal binding agents). Collect in closed containers for disposal. Clean contaminated articles and floor according to the environmental legislation.

Reference to other sections

Safe handling: see section 7
Personal protection equipment: see section 8
Disposal: see section 13

7. Handling and storage

Precautions for safe handling

Advice on safe handling

If handled uncovered, arrangements with local exhaust ventilation have to be used. Do not breathe gas/fumes/vapour/spray. Use only in well-ventilated areas.

If local exhaust ventilation is not possible or not sufficient, the entire working area should be ventilated by technical means.

Do not breathe vapour/aerosol.

Advice on protection against fire and explosion

Take precautionary measures against static discharges.

Conditions for safe storage, including any incompatibilities

Requirements for storage rooms and vessels

Keep container tightly closed in a cool, well-ventilated place.

Further information concerning storage conditions: Observe technical data sheet. Processing Guidelines

Further information on storage conditions

Protect against: heat. UV-radiation/sunlight.

Protect against: Emission of air/oxygen.

Materials to avoid: Air. Formation of: Peroxides.

8. Exposure controls/personal protection

Control parameters

Additional advice on limit values

No data available

Exposure controls
Appropriate engineering controls
If handled uncovered, arrangements with local exhaust ventilation have to be used.

Protective and hygiene measures
Remove contaminated, saturated clothing immediately. Draw up and observe skin protection programme. Wash hands and face before breaks and after work and take a shower if necessary. When using do not eat or drink.

Eye/face protection
Suitable eye protection: Tightly sealed safety glasses. Do not wear contact lenses.

Hand protection
Tested protective gloves are to be worn: Single-use gloves.
German Industry Norms (DIN) / European Norms (EN): DIN EN 374

Suitable material: NR (Natural rubber (Caoutchouc), Natural latex).
Thickness of glove material: 0.5 mm
penetration time (maximum wearing period): > 480 min
Recommended protective gloves brand: KCL 740 Dermatril, Manufacturer: KCL GmbH, D-36124 Eichenzell,
Source of supply: www.kcl.de

The quality of the protective gloves resistant to chemicals must be chosen as a function of the specific working place concentration and quantity of hazardous substances.
For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves.
Breakthrough times and swelling properties of the material must be taken into consideration. Before using check leak tightness / impermeability.

Skin protection
Wear suitable protective clothing.

Respiratory protection
If technical exhaust or ventilation measures are not possible or insufficient, respiratory protection must be worn. Respiratory protection necessary at: aerosol or mist generation. Filtering device (full mask or mouthpiece) with filter: A

Environmental exposure controls
Do not empty into drains.

9. Physical and chemical properties

Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Physical state:</th>
<th>liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color:</td>
<td>colourless</td>
</tr>
<tr>
<td>Odor:</td>
<td>characteristic</td>
</tr>
</tbody>
</table>

pH-Value: No data available

Changes in the physical state

| Melting point/freezing point: | No data available |
| Initial boiling point and boiling range: | > 126 °C |
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<table>
<thead>
<tr>
<th>mr-UVCur06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Print date: 11.10.2016</td>
</tr>
</tbody>
</table>

Sublimation point: No data available
Softening point: No data available
Pour point: No data available
Flash point: No data available

**Flammability**
- Solid: not applicable
- Gas: not applicable

**Explosive properties**
- No data available

**Auto-ignition temperature**
- Solid: not applicable
- Gas: not applicable

**Decomposition temperature:** not determined

**Flammability**
- No data available

**Explosive properties**
- No data available

**Auto-ignition temperature**
- Solid: not applicable
- Gas: not applicable

**Decomposition temperature:** not determined

**Oxidizing properties**
- Not oxidizing.

**Density (at 25 °C):** 1,02 g/cm³

**Water solubility:** No data available

**Partition coefficient:** No data available

**Viscosity / dynamic:** 13-15 mPa·s

**Viscosity / kinematic:** No data available

**Flow time:** No data available

**Vapour density:** No data available

**Evaporation rate:** No data available

**Solvent separation test:** No data available

**Other information**
- Solid content: not determined

**10. Stability and reactivity**

**Reactivity**
- No data available

**Chemical stability**
- Stable
  - The product is stable under storage at normal ambient temperatures.

**Possibility of hazardous reactions**
- Hazardous reactions: Will not occur
No known hazardous reactions.

**Conditions to avoid**
- Light
- Heat

**Incompatible materials**
- Reducing agent
- Peroxides
- Oxidizing agents, strong
- Acid, concentrated
- Alkalis (alkalis)

**Hazardous decomposition products**
In case of fire may be liberated: Nitrogen oxides (NOx). Carbon monoxide. Carbon dioxide (CO2). Peroxides.

### 11. Toxicological information

#### Information on toxicological effects

**Route(s) of Entry**
- Inhalation
- Ingestion
- Skin contact
- Eye contact

**Acute toxicity**
Based on available data, the classification criteria are not met.

<table>
<thead>
<tr>
<th>CAS No</th>
<th>Components</th>
<th>Exposure route</th>
<th>Dose</th>
<th>Species</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>1245638-61-2</td>
<td>2-propenoic acid, reaction products with pentaerythritol</td>
<td>oral</td>
<td>ATE</td>
<td>500 mg/kg</td>
<td></td>
</tr>
</tbody>
</table>

**Irritation and corrosivity**
- Causes skin irritation
- Causes serious eye damage
- Method: Calculation method.

**Sensitizing effects**
- May cause an allergic skin reaction (2-propenoic acid, reaction products with pentaerythritol), (phenylbis(2,4,6-trimethylbenzoyl)-phosphine oxide)
- Method: Calculation method.

**Carcinogenic/mutagenic/toxic effects for reproduction**
Based on available data, the classification criteria are not met.

**Specific target organ toxicity (STOT) - single exposure**
Based on available data, the classification criteria are not met.

**Specific target organ toxicity (STOT) - repeated exposure**
Based on available data, the classification criteria are not met.

- Carcinogenicity (NTP): Ingredient (name): none
- Carcinogenicity (IARC): Ingredient (name): none
- Carcinogenicity (OSHA): Ingredient (name): none

**Aspiration hazard**
Based on available data, the classification criteria are not met.

### 12. Ecological information

**Ecotoxicity**
- There are no data available on the mixture itself.

**Persistence and degradability**
- There are no data available on the mixture itself.
Bioaccumulative potential
There are no data available on the mixture itself.

Mobility in soil
No data available

Other adverse effects
No data available

Further information
Do not allow to enter into surface water or drains. Do not allow to enter into soil/subsoil.

13. Disposal considerations

Waste treatment methods
Advice on disposal
Do not allow to enter into surface water or drains. Do not allow to enter into soil/subsoil. Dispose of waste according to applicable legislation.

14. Transport information

US DOT 49 CFR 172.101
Proper shipping name: Not a hazardous material with respect to these transport regulations.

Marine transport (IMDG)
UN number: No dangerous good in sense of this transport regulation.
UN proper shipping name: No dangerous good in sense of this transport regulation.
Transport hazard class(es): No dangerous good in sense of this transport regulation.
Packing group: No dangerous good in sense of this transport regulation.

Air transport (ICAO)
UN number: No dangerous good in sense of this transport regulation.
UN proper shipping name: No dangerous good in sense of this transport regulation.
Transport hazard class(es): No dangerous good in sense of this transport regulation.
Packing group: No dangerous good in sense of this transport regulation.

Environmental hazards
ENVIRONMENTALLY HAZARDOUS: no

Special precautions for user
No data available

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
not applicable

15. Regulatory information

U.S. Regulations
National Inventory TSCA
not listed:
2-(2-ethoxyethoxy)ethyl methacrylate 45127-97-7
2-propenoic acid, reaction products with pentaerythritol 1245638-61-2

National regulatory information
SARA Section 311/312 Hazards:
2-propenoic acid, reaction products with pentaerythritol (1245638-61-2): Immediate (acute) health hazard
2-(2-ethoxyethoxy)ethyl methacrylate (45127-97-7): Fire hazard, Immediate (acute) health hazard
2-Propenoic acid, reaction products with pentaerythritol and TDI (68412-43-1): Immediate (acute) health
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Hazard
Phenyl bis(2,4,6-trimethylbenzoyl)-phosphine oxide (162881-26-7): Immediate (acute) health hazard

State Regulations
Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65, State of California)
This product contains no chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

16. Other information

Hazardous Materials Information Label (HMIS)

Health: 3
Flammability: 1
Physical Hazard: 1
Personal Protection: B

NFPA Hazard Ratings

Health: 3
Flammability: 1
Reactivity: 1
Unique Hazard: /

Changes

Revision Date: 11.10.2016
Revision No:
Chapter: 1; 2; 3; 4; 5; 6; 7; 8; 9; 10; 11; 12; 13; 14; 15

Abbreviations and acronyms

ADR: Accord européen sur le transport des marchandises dangereuses par Route
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service
LC50: Lethal concentration, 50%
LD50: Lethal dose, 50%

Other data

The above information describes exclusively the safety requirements of the product and is based on our present-day knowledge. The information is intended to give you advice about the safe handling of the product named in this safety data sheet, for storage, processing, transport and disposal. The information cannot be transferred to other products. In the case of mixing the product with other products or in the case of processing, the information on this safety data sheet is not necessarily valid for the new made-up material.

(The data for the hazardous ingredients were taken respectively from the last version of the sub-contractor's safety data sheet.)