

MICRO • CHEM
SAFETY DATA SHEET

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Rev. Date: 18 December 2008

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION -----

PRODUCT USE: Organic Polymer Solution
TRADE NAME: LOR A Series Resists
PRODUCT #: See Table 1 – Section 9

SUPPLIER: MicroChem Corporation
 90 Oak Street, PO Box 426
 Newton, MA 02464-0002

TELEPHONE: (617) 965-5511
FAX: (617) 965-5818
CHEMTREC USA
EMERGENCY #: (800) 424-9300
CHEMTREC INTL
EMERGENCY #: (703) 527-3887
MSDS DATE: 18 December 2008

SECTION 2. HAZARDS IDENTIFICATION -----

Hazardous Classification

Acute toxicity (oral) - Category 4
Acute toxicity (inhalation – gas/vapour) – Category 4
Flammable liquids - Category 3
Serious eye damage/eye irritation - Category 2A
Skin corrosion/irritation - Category 3
Target organ systemic toxicant single exp - Category 3
Target organ systemic toxicant repeat exp - Category 2



Signal Word: **WARNING!**

Hazards

Flammable liquid and vapour.
Causes serious eye irritation.
Causes mild skin irritation.
Harmful if inhaled.
Harmful if swallowed.
May cause damage to organs through prolonged or repeated exposure.
May cause drowsiness and dizziness.
May cause respiratory irritation.

Precautions

Do not eat, drink or smoke when using this product.
Use only outdoors or in a well-ventilated area.
Wash hands thoroughly after handling.
Do not breathe mist or vapors.
Keep away from heat, sparks and open flame. - No smoking.
Use explosion-proof equipment.
Wear protective gloves and eye/face protection.

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Take precautionary measures against static discharge.
If skin irritation occurs, get medical advice/attention.
IF INHALED: remove to fresh air and keep at rest in a position comfortable for breathing.
In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
Rinse mouth.
Call a POISON CENTRE or doctor/physician if you feel unwell.
Use extinguishing measures that are appropriate to local circumstances

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENTS: Cyclopentanone (CAS: 120-92-3); 65-90%.
Propylene glycol monomethyl ether (CAS: 107-98-2); 10-15%
Polyaliphatic imide copolymer (CAS: 102322-80-5); 1-20%
Proprietary Dye ; 0.1 - 2%
Proprietary Surfactant; <1%

SECTION 4. FIRST AID MEASURES

INHALATION: If respiratory irritation or distress occurs remove victim to fresh air and seek medical attention.
INGESTION: Do not induce vomiting unless instructed to do so by a physician. Wash out mouth with water and keep at rest. Seek immediate medical attention.
SKIN CONTACT: In case of contact, immediately wash with plenty of soap and water for at least 5 minutes. Seek medical attention. Remove contaminated clothing and shoes. Clean contaminated clothing and shoes before re-use.
EYE CONTACT: Hold eyelids open and flush with a steady, gentle stream of water for at least 15 minutes. Seek medical attention.

SECTION 5. FIRE-FIGHTING MEASURES

EXTINGUISHING

MEDIA: Dry chemical, carbon dioxide, alcohol foam, and universal foam.

SPECIAL FIRE FIGHTING PRECAUTIONS:

Firefighters should wear NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing. Remove all ignition sources if it can be done safely.

UNUSUAL FIRE OR EXPLOSION HAZARDS:

Product will burn under fire conditions. Containers may explode (due to build-up of pressure) when exposed to extreme heat. Vapors may travel a considerable distance to a source of ignition and flash back along vapor trail.

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SECTION 6. ACCIDENTAL RELEASE MEASURES

EVACUATION

PROCEDURES & SAFETY: Wear appropriate protective gear for the situation. See Personal Protection information in Section 8.

CLEANUP & DISPOSAL

OF SPILL: Absorb with an inert absorbent. Sweep up and place in an appropriate closed container (see Section 7). Clean up residual material by washing area with water. Collect washings for disposal.

ENVIRONMENTAL &

REGULATORY REPORTING: Do not flush to drain. If required proper authorities should be notified.

SECTION 7. HANDLING AND STORAGE

PRECAUTIONS: Store container tightly closed in well-ventilated place.

STORAGE: Store in tightly closed container in a cool, dry, well-ventilated environment away from ignition sources. Recommended container materials are polyethylene or glass.

HANDLING: Use only under yellow light.
Keep away from heat, sparks, and flames.
Use only with mechanical exhaust.
Do not contact with skin, eyes, and clothing. Severe eye irritant.
Avoid prolonged or repeated contact with skin.
Do not breathe vapors or mist.
Wash with soap and water after handling.
Have safety shower and eye wash available.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL

EXPOSURE LIMITS: Propylene glycol monomethyl ether: ACGIH TLV 100 ppm 8hr
TWA,
STEL 150 ppm.

RESPIRATORY

PROTECTION: Under normal conditions, use of air-purifying (half-mask/full-face) respirator with cartridges/canisters approved for use against organic vapors, dust, mists and fumes is recommended.

VENTILATION: General area dilution/exhaust ventilation.

SKIN PROTECTION: Skin contact should be minimized through the use of gloves and suitable long-sleeved clothing.

EYE PROTECTION: Eye contact should be prevented through use of chemical safety glasses with side shields or splash proof goggles.

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SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Clear, red
ODOR: Slightly sweet
BOILING POINT: 120-130 °C (248-266 °F)
SPECIFIC GRAVITY: See Table 1 below, @ 20 °C (68 °F)
VAPOR PRESSURE: 9 mm Hg @ 20 °C (68 °F)
VAPOR DENSITY: 2.3 (air=1)
H₂O SOLUBILITY: 10-20% @ 20 °C, by wt.
% VOLATILES: See Table 1 below
FLASH POINT: 30 °C (86 °F) TCC
AUTOIGNITION TEMP: 278 °C (532 °F)
FLAMMABILITY LIMITS: 1.3 lower (vol/vol %) unk. Upper

Table 1

| Name | Product # | Specific Gravity | Volatiles (% by wt) | VOC (g/L) |
|----------|-----------|------------------|---------------------|-----------|
| LOR 0.5A | G516602 | 0.965 | 98 | 945 |
| LOR 0.7A | G516603 | 0.968 | 97 | 940 |
| LOR 1A | G516604 | 0.973 | 96 | 940 |
| LOR 2A | G516605 | 0.977 | 95 | 935 |
| LOR 3A | G516606 | 0.98 | 94 | 920 |
| LOR 4A | G516607 | 0.982 | 93 | 915 |
| LOR 5A | G516608 | 0.984 | 92 | 905 |
| LOR 6A | G516658 | 0.986 | 92 | 905 |
| LOR 7A | G516609 | 0.988 | 91 | 900 |
| LOR 8A | G516610 | 0.988 | 90 | 895 |
| LOR 10A | G516611 | 0.99 | 89 | 885 |
| LOR 15A | G516612 | 0.99 | 87 | 860 |
| LOR 20A | G516614 | 0.99 | 86 | 850 |
| LOR 30A | G516616 | 0.99 | 84 | 830 |
| LOR 50A | G516619 | 0.995 | 81 | 820 |

SECTION 10. STABILITY AND REACTIVITY

STABILITY: Stable
INCOMPATIBILITY: Strong Oxidizing Agents, Strong Bases, Strong Acids, Strong Reducing Agents, Iron, Hydrazine
HAZARDOUS POLYMERIZATION: May occur. Avoid extreme pH.
HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS: Oxides of carbon.

SECTION 11. TOXICOLOGICAL INFORMATION

Routes of Entry: Inhalation, ingestion, eye and skin contact

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Symptoms of Exposure: Causes severe eye irritation. Causes mild skin irritation. May cause upper respiratory tract irritation, central nervous system depression, shortness of breath, drowsiness and confusion. Prolonged, repeated exposure to high concentrations can cause adverse effects to liver and kidney.

Acute Toxicity

Acute Oral Toxicity

Component: Cyclopentanone
LD50 rat 1180 mg/kg
Component: Propylene glycol monomethyl ether
LD50 rat 6100 mg/kg
Component: Polyaliphatic imide copolymer
LD50 rat >5000 mg/kg

Acute Dermal Toxicity

Component: Cyclopentanone
LD50 rabbit >5000 mg/kg
Component: Propylene glycol monomethyl ether
LD50 rat 13,000 mg/kg
Component: Polyaliphatic imide copolymer
LD50 rabbit >5000 mg/kg

Acute Inhalation Toxicity

Component: Cyclopentanone
LC50 rat 19.5 mg/l
Component: Propylene glycol monomethyl ether
LC50 rat 54.6 mg/l 4 hr

Specific Concentration Limits

The values listed below represent the percentages of ingredients of unknown toxicity:
3.5% Acute oral toxicity
3.5% Acute dermal toxicity
14.5% Acute inhalation toxicity

Skin corrosion/irritation

Component: Cyclopentanone
Acute Skin Irritation: skin irritation, 500mg, rabbit. Mildly irritating
Component: Propylene glycol monomethyl ether
Acute Skin Irritation: this substance is a mild skin irritant

Serious eye damage/eye irritation

Component: Cyclopentanone
Acute Eye Irritation: eye irritation, 100mg, rabbit. Severely irritating.
Component: Propylene glycol monomethyl ether
Acute Eye Irritation: Liquid is not irritating to eye. Mild eye irritation reported with vapor.

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Respiratory or Skin Sensitisation

Component: Cyclopentanone
Skin sensitization – guinea pig – not a sensitizer
Skin sensitization – human – not a sensitizer
Component: Propylene glycol monomethyl ether
Skin sensitization - Did not induce skin sensitization

Carcinogenicity

Component: Cyclopentanone
Not considered carcinogenic by NTP, IARC, ACGIH or OSHA.
Component: Propylene glycol monomethyl ether
Studies in laboratory animals indicate that this substance is not carcinogenic.

Germ Cell Mutagenicity

Component: Cyclopentanone
Ames Test – negative with and without metabolic activation
Component: Propylene glycol monomethyl ether
No evidence of genotoxicity in standard bacterial and mammalian test systems in vitro.

Specific Target Organ Systemic Toxicity (single exposure)

Component: Cyclopentanone
Central Nervous system
Component: Propylene glycol monomethyl ether
Central Nervous System

Specific Target Organ Systemic Toxicity (repeated exposure)

Component: Cyclopentanone
Central Nervous System
Component: Propylene glycol monomethyl ether
Central Nervous System, Liver, Kidney

Toxicity to Reproduction

Component: Cyclopentanone
No adverse effects to reproduction or adverse developmental effects known.
Component: Propylene glycol monomethyl ether
This substance is not expected to cause adverse reproductive effects at dose levels that are not also toxic to the parent.

Aspiration Hazards

No data found.

SECTION 12. ECOLOGICAL INFORMATION

Acute aquatic toxicity**Acute toxicity to fish**

Component: Cyclopentanone
48 hr LC50 *Leuciscus idus melanotus*: 2950 mg/L
Component: Propylene glycol monomethyl ether
96-h LC50 (*Pimephales promelas*): 20,800 mg/L

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Acute toxicity to aquatic invertebrates

Component: Cyclopentanone
24 hr EC50 Daphnia magna: 1435 mg/L
Component: Propylene glycol monomethyl ether
96-h EC50 Daphnia magna: 23,300 mg/L

Acute toxicity to algae

Component: Cyclopentanone
72 hr EC50 Scenedesmus subspicatus >100 mg/l
Component: Propylene glycol monomethyl ether
96 hr EC50 green algae >1,000 mg/l

Specific concentration limits

The values listed below represent the percentages of ingredients of unknown toxicity.

15% Acute aquatic toxicity – fish
15% Acute aquatic toxicity – aquatic invertebrates
15% Acute aquatic toxicity - algae

Chronic aquatic toxicity**Chronic toxicity to fish**

No data found

Chronic toxicity to aquatic invertebrates

No data found

Chronic toxicity to algae

No data found

Persistence/Degradability

Component: Cyclopentanone
Inherently biodegradable
Component: Propylene glycol monomethyl ether
Biodegradable under aerobic or anaerobic conditions. Aerobic biodegradation of 96% after 28 days. Anaerobic biodegradation of 38% after 81 days (30 day lag period).

Bioaccumulation

Component: Cyclopentanone
Not expected to bioaccumulate
Component: Propylene glycol monomethyl ether
Not expected to bioaccumulate in aquatic organisms. Log Kow (calculated):
-0.437

Mobility

Component: Cyclopentanone
No data found
Component: Propylene glycol monomethyl ether
Rapid dissipation in soil expected. Koc value between 1 and 50 indicating very high soil mobility.

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SECTION 13. DISPOSAL CONSIDERATIONS

Precautions

CONTAINERS MAY BE HAZARDOUS WHEN EMPTY. Since emptied containers retain product residue follow all MSDS and label warnings even after container is emptied. Dispose of contents/container in accordance with local regulation.

Disposal

Comply with applicable local, state or international regulations regarding the proper disposal of this material and/or containers. Dispose of contents/container in accordance with local regulations.

SECTION 14. TRANSPORTATION INFORMATION

HAZARD CLASSIFICATION: Flammable Liquid
SHIPPING NAME: Resin Solution
UN NUMBER: UN 1866
PACKING GROUP III

SECTION 15. REGULATORY INFORMATION

US AND INTERNATIONAL INFORMATION

Chemical Inventories: TSCA (US)- Components are listed or comply with TSCA regulations.
DSL/NDSL (Canada) – Components are listed or are exempt.
EINECS/ELINCS/NLP (EU) – Components are listed or exempt.

SARA Title III: This product IS NOT subject to SARA Title III, Section 313 Reporting Requirements.

Calif. SCAQMD Rule 443.1 VOC's: See Table 1 – Section 9

SECTION 16. OTHER INFORMATION

National Fire Protection Association Hazard Ratings – NFPA:

- 2 Health Hazard Rating
- 3 Flammability Rating
- 0 Reactivity Rating

For additional information contact: productsafety@microchem.com

To the best of our knowledge, the above information is believed to be accurate but does not claim to be all-inclusive and is intended to be used only as a guide. The supplier makes no warranty of any kind, expressed or implied, concerning the use of this product

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and shall not be held liable for any damage resulting from handling or from contact with the above product. User assumes all risks incident to its use.

MSDS Revision Information: NEW