MICRO CHEM

**Safety Data Sheet**
**acc. to OSHA HCS**

Printing date 10/10/2014 Reviewed on 10/10/2014

## 1 Identification of the substance/mixture and of the company

· **Product identifier**

· **Trade name: 950 PMMA Series Resists in Anisole**

· **Product number:**
M230001, M230002, M230003, M230004, M230504, M230005, M230505, M230006, M230007, M230008, M230009, M230010, M230011, M230012, M230013, M230015
· **Application of the substance / the mixture** Photoresist

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
MicroChem Corp.
200 Flanders Road
Westborough, MA 01581 USA

· **Information department:**
Product Safety
Email: productsafety@microchem.com
· **Emergency telephone number:**
MicroChem Corp : 617-965-5511
Chemtrec USA Emergency : 800-424-9300
Chemtrec International Emergency : 703-527-3887

## 2 Hazard(s) identification

· **Classification of the substance or mixture**

GHS02 Flame

Flam. Liq. 3 H226 Flammable liquid and vapor.

GHS07

Acute Tox. 4 H332 Harmful if inhaled.
Skin Irrit. 2 H315 Causes skin irritation.
Eye Irrit. 2A H319 Causes serious eye irritation.
STOT SE 3 H335 May cause respiratory irritation.

· **Label elements**
· **GHS label elements** The product is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**

GHS02 GHS07

· **Signal word** Warning

· **Hazard-determining components of labeling:**
Anisole
· **Hazard statements**
H226 Flammable liquid and vapor.
H332 Harmful if inhaled.
H315 Causes skin irritation.

(Contd. on page 2)

MICRO CHEM

**Safety Data Sheet**
**acc. to OSHA HCS**

Printing date 10/10/2014 Reviewed on 10/10/2014

**Trade name: 950 PMMA Series Resists in Anisole**

(Contd. of page 1)

H319 Causes serious eye irritation.
H335 May cause respiratory irritation.

· **Precautionary statements**

| | |
|---|---|
| P210 | Keep away from heat/sparks/open flames/hot surfaces. No smoking. |
| P260 | Do not breathe dust/fume/gas/mist/vapours/spray. |
| P280 | Wear protective gloves/protective clothing/eye protection/face protection. |
| P273 | Avoid release to the environment. |
| P301+P310 | IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. |
| P305+P351+P338 | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. |
| P304+P340 | IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. |
| P332+P313 | If skin irritation occurs: Get medical advice/attention. |
| P337+P313 | If eye irritation persists: Get medical advice/attention. |
| P370+P378 | In case of fire: Use for extinction: Alcohol resistant foam. |
| P370+P378 | In case of fire: Use for extinction: Fire-extinguishing powder. |
| P370+P378 | In case of fire: Use for extinction: Carbon dioxide. |
| P302+P352 | IF ON SKIN: Wash with plenty of soap and water. |
| P403+P233 | Store in a well-ventilated place. Keep container tightly closed. |
| P501 | Dispose of contents/container in accordance with local/regional/national/international regulations. |

· **Classification system:**
· **NFPA ratings (scale 0 - 4)**


Health = 1
Fire = 2
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**


Health = 1
Fire = 2
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

## 3 Composition/information on ingredients

· **Chemical characterization: Mixtures**
· **Description:** Mixture of the substances listed below with nonhazardous additions.

· **Dangerous components:**

| | | |
|---|---|---|
| 100-66-3 | Anisole<br>Flam. Liq. 3, H226; Acute Tox. 4, H332; Skin Irrit. 2, H315; Eye Irrit. 2A, H319; STOT SE 3, H335 | 80-100% |

· **Additional Components:**

| | | |
|---|---|---|
| 9011-14-7 | Poly(methyl methacrylate) | 1-20% |



(Contd. on page 3)

MICRO CHEM

**Safety Data Sheet**
**acc. to OSHA HCS**

Printing date 10/10/2014 Reviewed on 10/10/2014

**Trade name: 950 PMMA Series Resists in Anisole**

(Contd. of page 2)

## 4 First-aid measures

· **Description of first aid measures**
· **After inhalation:**
Inhalation is not an expected route of exposure. If respiratory irritation or distress occurs remove victim to fresh air. Seek medical attention if respiratory irritation or distress continues.
· **After skin contact:** Immediately wash with water and soap and rinse thoroughly.
· **After eye contact:**
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
· **After swallowing:**
Do not induce vomiting unless instructed to do so by a physician. Wash out mouth with water and keep person at rest. Seek immediate medical attention.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

## 5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:**
Alcohol resistant foam
Fire-extinguishing powder
Carbon dioxide
· **For safety reasons unsuitable extinguishing agents:**
Water with full jet
Water
· **Special hazards arising from the substance or mixture**
Containers may explode due to pressure increase when container is exposed to extreme heat. Vapors may travel a considerable distance to a source of ignition and flash back along vapor trail.
· **Advice for firefighters**
· **Protective equipment:** Wear SCBA.

## 6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**
Keep away from ignition sources
Ensure adequate ventilation
Wear protective equipment. Keep unprotected persons away.
· **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Ensure adequate ventilation.
Do not flush with water or aqueous cleansing agents
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.



(Contd. on page 4)

MICRO CHEM

**Safety Data Sheet**
**acc. to OSHA HCS**

Printing date 10/10/2014

Reviewed on 10/10/2014

**Trade name: 950 PMMA Series Resists in Anisole**

(Contd. of page 3)

## 7 Handling and storage

· **Handling:**
· **Precautions for safe handling**
Use only under yellow light
Keep receptacles tightly sealed.
Use only in well ventilated areas.
Ensure good ventilation/exhaust at the workplace.
Prevent formation of aerosols.
· **Information about protection against explosions and fires:**
Use explosion-proof apparatus / fittings and spark-proof tools.
Keep ignition sources away - Do not smoke.
Protect against electrostatic charges.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and containers:**
Store in inert atmosphere or keep well sealed to prevent the formation of peroxides and other oxidation products.
· **Information about storage in one common storage facility:** Not required.
· **Further information about storage conditions:**
Protect from exposure to the light.
Store in a cool place. Heat will increase pressure and may lead to the receptacle bursting.
Keep container tightly sealed.
· **Specific end use(s)** Preparation of radiation sensitive layers in fabrication of microelectronic devices

## 8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**
· **Components with limit values that require monitoring at the workplace:**
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from food and beverages.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes and skin.
· **Respiratory equipment:**
In case of low exposure, use cartridge respirator. In case of intensive or longer exposure, use SCBA.
· **Protection of hands:**

Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
Contact golve manufacturerer for break-through time.

(Contd. on page 5)

MICRO CHEM

**Safety Data Sheet**
**acc. to OSHA HCS**

Printing date 10/10/2014

Reviewed on 10/10/2014

**Trade name: 950 PMMA Series Resists in Anisole**

(Contd. of page 4)

· **Material of gloves**
Fluorocarbon rubber (Viton)
Nitrile rubber, NBR
· **Penetration time of glove material** Contact glove manufacture for break-through time.
· **For the permanent contact gloves made of the following materials are suitable:** Fluorocarbon rubber (Viton)
· **As protection from splashes gloves made of the following materials are suitable:** Nitrile rubber, NBR
· **Eye protection:**

Tightly sealed goggles

· **Body protection:** Impervious protective clothing

## 9 Physical and chemical properties

| | |
|---|---|
| · **Information on basic physical and chemical properties** | |
| · **General Information** | |
| · **Appearance:** | |
| **Form:** | Liquid |
| **Color:** | Clear to light yellow |
| · **Odor:** | Strong |
| · **Odour threshold:** | Not determined. |
| · **pH-value:** | Not determined. |
| · **Change in condition** | |
| **Melting point/Melting range:** | Undetermined. |
| **Boiling point/Boiling range:** | 184 °C (363 °F) |
| · **Flash point:** | 43 °C (109 °F) |
| · **Flammability (solid, gaseous):** | Not applicable. |
| · **Ignition temperature:** | 475 °C (887 °F) |
| · **Decomposition temperature:** | Not determined. |
| · **Auto igniting:** | Product is not selfigniting. |
| · **Danger of explosion:** | Product is not explosive. However, formation of explosive air/vapor mixtures are possible. |
| · **Explosion limits:** | |
| **Lower:** | Not determined. |
| **Upper:** | Not determined. |
| · **Vapor pressure at 20 °C (68 °F):** | 0.4 hPa |
| · **Density:** | See Table 1 Other Information below |
| · **Relative density** | Not determined. |
| · **Vapour density** | Not determined. |
| · **Evaporation rate** | Not determined. |
| · **Solubility in / Miscibility with** | |
| **Water:** | Water miscible No |
| · **Partition coefficient (n-octanol/water):** | Not determined. |

(Contd. on page 6)

MICRO CHEM

**Safety Data Sheet**
**acc. to OSHA HCS**

Printing date 10/10/2014

Reviewed on 10/10/2014

**Trade name: 950 PMMA Series Resists in Anisole**

(Contd. of page 5)

· **Viscosity:**
**Dynamic:** Not determined.
**Kinematic:** Not determined.

· **Solvent content:**
**VOC content:** See Table 1 below
· **Other information** Table 1. Product specfic gravity and VOC data.

| Name | Number | Sp.Grav. | Vol.(%by wt.) | VOC (g/L) |
|---|---|---|---|---|
| 950A1 | M230001 | 0.994 | 99 | 985 |
| 950A2 | M230002 | 0.996 | 98 | 975 |
| 950A3 | M230003 | 0.998 | 97 | 970 |
| 950A4 | M230004 | 1.000 | 96 | 960 |
| 950A4.5 | M230504 | 1.001 | 95.5 | 958 |
| 950A5 | M230005 | 1.004 | 95 | 955 |
| 950A5.5 | M230505 | 1.004 | 94.5 | 950 |
| 950A6 | M230006 | 1.005 | 94 | 945 |
| 950A7 | M230007 | 1.007 | 93 | 935 |
| 950A8 | M230008 | 1.009 | 92 | 930 |
| 950A9 | M230009 | 1.010 | 91 | 920 |
| 950A10 | M230010 | 1.012 | 90 | 910 |
| 950A11 | M230011 | 1.014 | 89 | 900 |
| 950A12 | M230012 | 1.016 | 88 | 895 |
| 950A13 | M230013 | 1.018 | 87 | 885 |
| 950A15 | M230015 | 1.022 | 85 | 870 |

## 10 Stability and reactivity

· **Reactivity**
· **Chemical stability** Stable under normal use conditions
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions** No dangerous reactions known.
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** Strong Oxidizing Agents, Strong Acids, Strong Bases
· **Hazardous decomposition products:**
Carbon monoxide and carbon dioxide
Phenol
methyl methacrylate

## 11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**

**100-66-3 Anisole**

| | | |
|---|---|---|
| Oral | LD50 | 3700 mg/kg (Rat) |
| Dermal | LD50 | >5000 mg/kg (rabbit) |

· **Primary irritant effect:**
· **on the skin:** Irritant to skin and mucous membranes.
· **on the eye:** Irritating effect.

(Contd. on page 7)

MICRO CHEM

**Safety Data Sheet**
**acc. to OSHA HCS**

Printing date 10/10/2014 Reviewed on 10/10/2014

**Trade name: 950 PMMA Series Resists in Anisole**

(Contd. of page 6)

· **Sensitization:** No sensitizing effects known.
· **Experience with humans:** No further relevant information available.
· **Additional toxicological information:**
The product shows the following dangers according to internally approved calculation methods for preparations:
Irritant

· **Carcinogenic categories**

| · **IARC (International Agency for Research on Cancer)** | | |
|---|---|---|
| 9011-14-7 | Poly(methyl methacrylate) | 3 |

| · **NTP (National Toxicology Program)** |
|---|
| None of the ingredients are listed. |

## 12 Ecological information

· **Toxicity**

| · **Aquatic toxicity:** | |
|---|---|
| **100-66-3 Anisole** | |
| EC50/24 h | 40 mg/l (daphnia magna) |
| EC50/96 hr | 162 mg/l (green algae) |
| LC50/48 hr | 120 mg/L (Cyprinus carpio (common carp)) |

· **Persistence and degradability** Moderately /partly biodegradable
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:**
Water hazard class 2 (Self-assessment): hazardous for water
Do not allow product to reach ground water, water course or sewage system.
Danger to drinking water if even small quantities leak into the ground.
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

## 13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:**
Disposal must be made in accordance with Federal, State, and Local regulations.
Must not be disposed of as regular garbage/trash. Do not allow product to reach sewage system.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made in accordance with Federal, State, and Local regulations.

## 14 Transport information

· **UN-Number**
· **DOT, ADR, IMDG, IATA** UN1866

(Contd. on page 8)

MICRO CHEM

**Safety Data Sheet**
**acc. to OSHA HCS**

Printing date 10/10/2014

Reviewed on 10/10/2014

**Trade name: 950 PMMA Series Resists in Anisole**

(Contd. of page 7)

| | |
|---|---|
| · **UN proper shipping name** | |
| · **DOT, ADR** | Resin solution, mixture |
| · **IMDG, IATA** | RESIN SOLUTION, mixture |
| · **Transport hazard class(es)** | |
| · **DOT** |  |
| · **Class** | 3 Flammable liquids. |
| · **Label** | 3 |
| · **ADR, IMDG, IATA** |  |
| · **Class** | 3 Flammable liquids |
| · **Label** | 3 |
| · **Packing group** | |
| · **DOT, ADR, IMDG, IATA** | III |
| · **Environmental hazards:** | |
| · **Marine pollutant:** | No |
| · **Special precautions for user** | Warning: Flammable liquids |
| · **Danger code (Kemler):** | 30 |
| · **EMS Number:** | F-E,S-D |
| · **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code** | Not applicable. |
| · **UN "Model Regulation":** | UN1866, Resin solution, mixture, 3, III |

## 15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**

· **Section 355 (extremely hazardous substances):**
None of the ingredients are listed.

· **Section 313 (Specific toxic chemical listings):**
None of the ingredients is listed.

· **TSCA (Toxic Substances Control Act):**
All ingredients are listed or comply with TSCA regulations.

· **Proposition 65**

· **Chemicals known to cause cancer:**
None of the ingredients are listed.

(Contd. on page 9)

(Contd. of page 8)

· **Chemicals known to cause reproductive toxicity for females:**
None of the ingredients are listed.

· **Chemicals known to cause reproductive toxicity for males:**
None of the ingredients are listed.

· **Chemicals known to cause developmental toxicity:**
None of the ingredients are listed.

· **Carcinogenic categories**

· **EPA (Environmental Protection Agency)**
None of the ingredients are listed.

· **TLV (Threshold Limit Value established by ACGIH)**
None of the ingredients are listed.

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**
None of the ingredients are listed.

· **OSHA-Ca (Occupational Safety & Health Administration)**
None of the ingredients are listed.

· **New Jersey State Right To Know List**

| | |
|---|---|
| 100-66-3 | Anisole |

· **California SCAQMD Rule 443.1 VOC's:** See Table 1 - Section 9
· **GHS label elements** The product is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**

GHS02 GHS07

· **Signal word** Warning

· **Hazard-determining components of labeling:**
Anisole
· **Hazard statements**
H226 Flammable liquid and vapor.
H332 Harmful if inhaled.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.
· **Precautionary statements**

| | |
|---|---|
| P210 | Keep away from heat/sparks/open flames/hot surfaces. No smoking. |
| P260 | Do not breathe dust/fume/gas/mist/vapours/spray. |
| P280 | Wear protective gloves/protective clothing/eye protection/face protection. |
| P273 | Avoid release to the environment. |
| P301+P310 | IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. |
| P305+P351+P338 | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. |
| P304+P340 | IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. |
| P332+P313 | If skin irritation occurs: Get medical advice/attention. |
| P337+P313 | If eye irritation persists: Get medical advice/attention. |
| P370+P378 | In case of fire: Use for extinction: Alcohol resistant foam. |

(Contd. on page 10)
USA

MICRO CHEM

**Safety Data Sheet**
**acc. to OSHA HCS**

Printing date 10/10/2014

Reviewed on 10/10/2014

**Trade name: 950 PMMA Series Resists in Anisole**

(Contd. of page 9)

| | |
|---|---|
| P370+P378 | In case of fire: Use for extinction: Fire-extinguishing powder. |
| P370+P378 | In case of fire: Use for extinction: Carbon dioxide. |
| P302+P352 | IF ON SKIN: Wash with plenty of soap and water. |
| P403+P233 | Store in a well-ventilated place. Keep container tightly closed. |
| P501 | Dispose of contents/container in accordance with local/regional/national/international regulations. |

· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

## 16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Department issuing MSDS:** Product safety department
· **Contact:** Mr. Cole

· **Revision History:**
The business address of the manufacturer in Section 1 was updated. The hazard classification and precautionary statements for the mixture in Section 2 were revised. The toxicology data in Sections 11 and 12 were revised.
· **Date of preparation / last revision** 10/10/2014 / 1
· **Abbreviations and acronyms:**
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
ICAO: International Civil Aviation Organization
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
VOC: Volatile Organic Compounds (USA, EU)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent