KAYAKU ADVANCED MATERIALS

Safety data sheet
according to 1907/2006/EC, Article 31

Printing date 14.08.2019 Version number 3 Revision: 14.08.2019

SECTION 1: Identification of the substance/mixture and of the company/undertaking

· **1.1 Product identifier**

· **Trade name: 495 PMMA Series Resists in Anisole**

· **Article number:**
M130001, M130002, M130003, M130004, M130504, M130005, M130505, M130006, M130007, M130507, M130008, M130508, M130009, M130010, M130011, M130015, M130515

· **1.2 Relevant identified uses of the substance or mixture and uses advised against**
· **Sector of Use** SU16 Manufacture of computer, electronic and optical products, electrical equipment
· **Application of the substance / the mixture** Photoresist

· **1.3 Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Kayaku Advanced Materials
200 Flanders Road
Westborough, MA 01581
Tel: (617) 965-5511
Fax: (617) 965-5818

· **Further information obtainable from:**
Product Safety
Email: productsafety@kayakuAM.com
· **1.4 Emergency telephone number:**
Kayaku Advanced Materials : 617-965-5511
Chemtrec USA Emergency : 800-424-9300 (24 hr)
Chemtrec International Emergency : 703-527-3887 (24 hr)

SECTION 2: Hazards identification

· **2.1 Classification of the substance or mixture**
· **Classification according to Regulation (EC) No 1272/2008**

GHS02 flame

Flam. Liq. 3 H226 Flammable liquid and vapour.

GHS07

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

· **2.2 Label elements**
· **Labelling according to Regulation (EC) No 1272/2008**
The product is classified and labelled according to the CLP regulation.
· **Hazard pictograms**

GHS02 GHS07

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· ***Signal word*** *Warning*

· ***Hazard-determining components of labelling:***
Anisole
· ***Hazard statements***
H226 Flammable liquid and vapour.
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, hot surfaces, sparks, open flames and other ignition sources. No smoking.*
P261	*Avoid breathing dust/fume/gas/mist/vapours/spray.*
P280	*Wear protective gloves/protective clothing/eye protection/face protection.*
P301+P310	*IF SWALLOWED: Immediately call a POISON CENTER/ doctor.*
P302+P352	*IF ON SKIN: Wash with plenty of soap and water.*
P304+P340	*IF INHALED: Remove person to fresh air and keep comfortable for breathing.*
P305+P351+P338	*IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.*
P333+P313	*If skin irritation or rash 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.*
P403+P235	*Store in a well-ventilated place. Keep cool.*
P501	*Dispose of contents/container in accordance with local/regional/national/international regulations.*

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

SECTION 3: Composition/information on ingredients

· ***3.2 Chemical characterisation: Mixtures***
· ***Description:*** *Mixture of substances listed below with nonhazardous additions.*

· ***Dangerous components:***		
CAS: 100-66-3 *EINECS: 202-876-1*	*Anisole* *Flam. Liq. 3, H226; Acute Tox. 4, H332; Skin Irrit. 2, H315; Eye Irrit. 2, H319; STOT SE 3, H335*	*80-100%*

· ***Additional Components:***		
CAS: 9011-14-7 *EC number: 618-466-4*	*Poly(methyl methacrylate)*	*1-20%*

· ***Additional information:*** *For the wording of the listed hazard phrases refer to section 16.*

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SECTION 4: First aid measures

· ***4.1 Description of first aid measures***
· ***After inhalation:***
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
· ***After skin contact:*** *Immediately wash with water and soap and rinse thoroughly.*
· ***After eye contact:***
Wash eyes immediately with a large amount of water or normal saline, occasionally lifting upper and lower eye lids until no evidence of chemical remains (about 20 minutes). Remove contact lenses if present and easy to remove. Seek immediate medical attention.
· ***After swallowing:*** *If symptoms persist consult doctor.*
· ***4.2 Most important symptoms and effects, both acute and delayed*** *No further relevant information available.*
· ***4.3 Indication of any immediate medical attention and special treatment needed*** *Treat symptomatically.*

SECTION 5: Firefighting measures

· ***5.1 Extinguishing media***
· ***Suitable extinguishing agents:***
Alcohol resistant foam
Fire-extinguishing powder
Carbon dioxide
· ***For safety reasons unsuitable extinguishing agents:***
Water with full jet
Water
· ***5.2 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.
· ***5.3 Advice for firefighters***
· ***Protective equipment:*** *Wear self-contained respiratory protective device.*

SECTION 6: Accidental release measures

· ***6.1 Personal precautions, protective equipment and emergency procedures***
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation
Keep away from ignition sources.
· ***6.2 Environmental precautions:*** *Do not allow to enter sewers/ surface or ground water.*
· ***6.3 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
· ***6.4 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.

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SECTION 7: Handling and storage

· ***7.1 Precautions for safe handling***
Use only under yellow light
Ensure good ventilation/exhaust at the workplace.
Prevent formation of aerosols.
· ***Information about fire - and explosion protection:***
Keep ignition sources away - Do not smoke.
Use explosion-proof apparatus / fittings and spark-proof tools.
Protect against electrostatic charges.

· ***7.2 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:***
Do not store together with alkalis (caustic solutions).
Do not store together with oxidising and acidic materials.
· ***Further information about storage conditions:***
Store in cool, dry conditions in well sealed containers.
Protect from heat and direct sunlight.
Store receptacle in a well ventilated area.
· ***7.3 Specific end use(s)*** *Preparation of radiation sensitive layers in fabrication of microelectronic devices*

SECTION 8: Exposure controls/personal protection

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

· ***8.1 Control parameters***
· ***Ingredients 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 valid during the making were used as basis.*

· ***8.2 Exposure controls***
· ***Personal protective equipment:***
· ***General protective and hygienic measures:***
Wash hands before breaks and at the end of work.
Keep away from food and beverages.
Immediately remove all soiled and contaminated clothing
Avoid contact with the eyes and skin.
· ***Respiratory protection:*** *Use suitable respiratory protective device in case of insufficient ventilation.*
· ***Protection of hands:***

Protective gloves

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
· ***Material of gloves*** *Nitrile rubber, NBR*
· ***Penetration time of glove material***
The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

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· ***Eye protection:***

Tightly sealed goggles

SECTION 9: Physical and chemical properties

· ***9.1 Information on basic physical and chemical properties***	
· ***General Information***	
· ***Appearance:***	
Form:	*Liquid*
Colour:	*According to product specification*
· ***Odour:***	*Strong*
· ***Odour threshold:***	*Not determined.*
· ***pH-value:***	*Not determined.*
· ***Change in condition***	
Melting point/freezing point:	*Undetermined.*
Initial boiling point and boiling range:	*184 °C*
· ***Flash point:***	*43 °C*
· ***Flammability (solid, gas):***	*Not applicable.*
· ***Ignition temperature:***	*475 °C*
· ***Decomposition temperature:***	*Not determined.*
· ***Auto-ignition temperature:***	*Product is not selfigniting.*
· ***Explosive properties:***	*Product is not explosive. However, formation of explosive air/vapour mixtures are possible.*
· ***Explosion limits:***	
Lower:	*Not determined.*
Upper:	*Not determined.*
· ***Vapour pressure at 20 °C:***	*0.4 hPa*
· ***Density:***	*Not determined*
· ***Relative density***	*See Table 1 Other Information*
· ***Vapour density***	*Not determined.*
· ***Evaporation rate***	*Not determined.*
· ***Solubility in / Miscibility with water:***	*Not miscible or difficult to mix.*
· ***Partition coefficient: n-octanol/water:***	*Not determined.*
· ***Viscosity:***	
Dynamic:	*Not determined.*

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Kinematic: *Not determined.*

· ***9.2 Other information***

Name	*Number*	*Sp.Grav.*	*Vol.(%by wt.)*	*VOC (g/L)*
495A1	*M130001*	*0.995*	*99*	*985*
495A2	*M130002*	*0.997*	*98*	*975*
495A3	*M130003*	*0.999*	*97*	*970*
495A4	*M130004*	*1.001*	*96*	*960*
495A4.5	*M130504*	*1.002*	*95.5*	*957*
495A5	*M130005*	*1.003*	*95*	*955*
495A5.5	*M130505*	*1.004*	*94.5*	*950*
495A6	*M130006*	*1.005*	*94*	*945*
495A7	*M130007*	*1.007*	*93*	*935*
495A7.5	*M130507*	*1.008*	*92.5*	*930*
495A8	*M130008*	*1.009*	*92*	*930*
495A8.5	*M130508*	*1.010*	*91.5*	*925*
495A9	*M130009*	*1.011*	*91*	*920*
495A10	*M130010*	*1.013*	*90*	*910*
495A11	*M130011*	*1.014*	*89*	*900*
495A15	*M130015*	*1.018*	*85*	*865*
495A15.5	*M130515*	*1.019*	*84.5*	*860*

SECTION 10: Stability and reactivity

· ***10.1 Reactivity*** *No further relevant information available.*
· ***10.2 Chemical stability*** *Stable*
· ***Thermal decomposition / conditions to be avoided:*** *No decomposition if used according to specifications.*
· ***10.3 Possibility of hazardous reactions*** *No dangerous reactions known.*
· ***10.4 Conditions to avoid***
Heat, flames and sparks. Extremes of temperature and direct sunlight.
Contact with incompatible materials.
· ***10.5 Incompatible materials:*** *Strong Oxidizing Agents, Strong Acids, Strong Bases*
· ***10.6 Hazardous decomposition products:***
Carbon monoxide and carbon dioxide
Phenol
methyl methacrylate

SECTION 11: Toxicological information

· ***11.1 Information on toxicological effects***
· ***Acute toxicity***
Harmful if inhaled.

· ***LD/LC50 values relevant for classification:***		
100-66-3 Anisole		
Oral	*LD50*	*3700 mg/kg (Rat)*
Dermal	*LD50*	*>5000 mg/kg (rabbit)*

· ***Primary irritant effect:***
· ***Skin corrosion/irritation***
Causes skin irritation.
· ***Serious eye damage/irritation***
Causes serious eye irritation.

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· ***Respiratory or skin sensitisation*** *Based on available data, the classification criteria are not met.*
· ***Experience with humans:*** *No further relevant information available.*
· ***CMR effects (carcinogenity, mutagenicity and toxicity for reproduction)***
· ***Germ cell mutagenicity*** *Based on available data, the classification criteria are not met.*
· ***Carcinogenicity*** *Based on available data, the classification criteria are not met.*
· ***Reproductive toxicity*** *Based on available data, the classification criteria are not met.*
· ***STOT-single exposure***
May cause respiratory irritation.
· ***STOT-repeated exposure*** *Based on available data, the classification criteria are not met.*
· ***Aspiration hazard*** *Based on available data, the classification criteria are not met.*

SECTION 12: Ecological information

· ***12.1 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))*

· ***12.2 Persistence and degradability*** *No further relevant information available.*
· ***12.3 Bioaccumulative potential*** *No further relevant information available.*
· ***12.4 Mobility in soil*** *No further relevant information available.*
· ***Additional ecological information:***
· ***General notes:***
Water hazard class 2 (German Regulation) (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.
· ***12.5 Results of PBT and vPvB assessment***
· ***PBT:*** *Not applicable.*
· ***vPvB:*** *Not applicable.*
· ***12.6 Other adverse effects*** *No further relevant information available.*

SECTION 13: Disposal considerations

· ***13.1 Waste treatment methods***
· ***Recommendation***
Must not be disposed together with household garbage. Do not allow product to reach sewage system.
Disposal must be made in accordance with International, National, and regional regulations.

· ***Uncleaned packaging:***
· ***Recommendation:*** *Disposal must be made according to official regulations.*

SECTION 14: Transport information

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

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· **14.2 UN proper shipping name**	
· **ADR, IMDG, IATA**	*RESIN SOLUTION*
· **14.3 Transport hazard class(es)**	
· **ADR, IMDG, IATA**	
· **Class**	*3 Flammable liquids.*
· **Label**	*3*
· **14.4 Packing group**	
· **ADR, IMDG, IATA**	*III*
· **14.5 Environmental hazards:**	
· **Marine pollutant:**	*No*
· **14.6 Special precautions for user**	*Warning: Flammable liquids.*
· **Danger code (Kemler):**	*30*
· **EMS Number:**	*F-E,S-D*
· **14.7 Transport in bulk according to Annex II of Marpol and the IBC Code**	*Not applicable.*
· **Transport/Additional information:**	
· **ADR**	
· **Limited quantities (LQ)**	*5L*
· **Transport category**	*3*
· **Tunnel restriction code**	*D/E*
· **UN "Model Regulation":**	*UN1866, RESIN SOLUTION, 3, III*

SECTION 15: Regulatory information

· **15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **REGULATION (EC) No 1907/2006 ANNEX XVII** *Conditions of restriction: 3*
· **15.2 Chemical safety assessment:** *A Chemical Safety Assessment has not been carried out.*

SECTION 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.

· **Relevant phrases**
H226 Flammable liquid and vapour.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H332 Harmful if inhaled.
H335 May cause respiratory irritation.
· **Classification according to Regulation (EC) No 1272/2008**
Art. 9(1) of Regulation (EC) No. 1272/2008 was used for classification purposes.

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· ***Department issuing SDS:*** *Product safety department*
· ***Contact:*** *Tom Cole, EHS Manager (tcole@kayakuAM)*
· ***Revision History:***
The manufacturer's information in Section 1, the product hazard information in Section 2 and the component hazard information in Section 3 have been updated.
· ***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 Organisation
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
IATA: International Air Transport Association
GHS: Globally Harmonised 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 (division of the American Chemical Society)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
Flam. Liq. 3: Flammable liquids – Category 3
Acute Tox. 4: Acute toxicity – Category 4
Skin Irrit. 2: Skin corrosion/irritation – Category 2
Eye Irrit. 2: Serious eye damage/eye irritation – Category 2
STOT SE 3: Specific target organ toxicity (single exposure) – Category 3