

## Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 04.04.2023

Version number 6

Revision: 04.04.2023

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

#### 1.1 Product identifier

Trade name: **LOR A Series Resists**

#### Article number:

G516602, G516603, G516604, G516605, G516606, G516607, G516608, G516658, G516609, G516610, G516611, G516612, G516614, G516616, G516619

#### 1.2 Relevant identified uses of the substance or mixture and uses advised against

No further relevant information available.

Sector of Use SU16 Manufacture of computer, electronic and optical products, electrical equipment

Product category PC30 Photo-chemicals

Application of the substance / the mixture Photoresist

#### 1.3 Details of the supplier of the safety data sheet

##### Manufacturer/Supplier:

Manufacturer:

Kayaku Advanced Materials

200 Flanders Road

Westborough, MA 01581

Telephone: (617) 965-5511

Fax: (617) 965-5818

Importer:

A-Gas Electronic Materials

Unit 3, IO Centre

Swift Valley

Rugby, Warwickshire

CV21 1TW, UK

Tel: +44-0-1788-537535

Fax: +44-0-1788-535835

Website: [www.agasem.com](http://www.agasem.com)

Email: [customerservice.em@agas.com](mailto:customerservice.em@agas.com)

#### Further information obtainable from:

Product Safety

Email: [productsafety@kayakuAM.com](mailto: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



Flam. Liq. 3 H226 Flammable liquid and vapour.



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Skin Irrit. 2 H315 Causes skin irritation.

Eye Irrit. 2 H319 Causes serious eye irritation.

### · 2.2 Label elements

#### · Labelling according to Regulation (EC) No 1272/2008

The product is classified and labelled according to the GB CLP regulation.

#### · Hazard pictograms



GHS02 GHS07

#### · Signal word Warning

#### · Hazard statements

H226 Flammable liquid and vapour.

H315 Causes skin irritation.

H319 Causes serious eye irritation.

#### · Precautionary statements

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P260 Do not breathe 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+P341 IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position 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 to extinguish: Alcohol resistant foam, Fire-extinguishing powder, 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

None of the ingredients are included in the list established in accordance with Article 59(1) for having endocrine disrupting properties.

None of the ingredients are substances identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 (or Commission Regulation (EU) 2018/605.

#### · 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.

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<b>· Dangerous components:</b>			
CAS: 120-92-3	Cyclopentanone		65-90%
EINECS: 204-435-9	Flam. Liq. 3, H226; Skin Irrit. 2, H315; Eye Irrit. 2, H319		
CAS: 107-98-2	1-methoxy-2-propanol		5-25%
EINECS: 203-539-1	Flam. Liq. 3, H226; STOT SE 3, H336		
	Proprietary Dye A		0.1-2%
<b>· Additional Components:</b>			
102322-80-5	Polyaliphatic imide copolymer	Skin Irrit. 2, H315; Eye Irrit. 2, H319	1-20%
<b>· Additional information:</b> For the wording of the listed hazard phrases refer to section 16.			

### SECTION 4: First aid measures

- **4.1 Description of first aid measures**
- **General information:** Immediately remove any clothing soiled by the product.
- **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.  
If skin irritation continues, consult a doctor.
- **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.

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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.

### SECTION 7: Handling and storage

 · **7.1 Precautions for safe handling**

No release to water in manufacturing, process, use or disposal.

Ensure good ventilation/exhaust at the workplace.

Prevent formation of aerosols.

Keep receptacles tightly sealed.

Use only under yellow light

 · **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 a cool location.

 · **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)** No further relevant information available.

### SECTION 8: Exposure controls/personal protection

 · **8.1 Control parameters**

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

 · **Ingredients with limit values that require monitoring at the workplace:**
**107-98-2 1-methoxy-2-propanol**

 WEL Short-term value: 560 mg/m<sup>3</sup>, 150 ppm

 Long-term value: 375 mg/m<sup>3</sup>, 100 ppm

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 · **Additional information:** The lists valid during the making were used as basis.

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- **8.2 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.  
 Do not inhale gases / fumes / aerosols.
- **Respiratory protection:**  
 In case of low exposure use cartridge respirator. In case of intensive or longer exposure use self-contained respiratory protective device.
- **Protection of hands:**



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

- **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.
- **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:	Red
Odour:	Slightly sweet
Odour threshold:	Not determined.

· pH-value: Not determined.

##### · Change in condition

Melting point/freezing point:	Undetermined.
Initial boiling point and boiling range:	120 °C

· Flash point: 30 °C

· Flammability (solid, gas): Not applicable.

· Auto-ignition temperature: 270 °C

· Decomposition temperature: Not determined.

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· <b>Ignition temperature:</b>	Product is not selfigniting.																																																																																
· <b>Explosive properties:</b>	Product is not explosive. However, formation of explosive air/vapour mixtures are possible.																																																																																
· <b>Explosion limits:</b>																																																																																	
<b>Lower:</b>	2.3 Vol %																																																																																
<b>Upper:</b>	Not determined.																																																																																
· <b>Vapour pressure at 20 °C:</b>	12 hPa																																																																																
· <b>Density:</b>	Not determined																																																																																
· <b>Relative density</b>	See Table 1 Other Information																																																																																
· <b>Vapour density</b>	Not determined.																																																																																
· <b>Evaporation rate</b>	Not determined.																																																																																
· <b>Solubility in / Miscibility with water:</b>	Not miscible or difficult to mix.																																																																																
· <b>Partition coefficient: n-octanol/water:</b>	Not determined.																																																																																
· <b>Viscosity:</b>																																																																																	
<b>Dynamic:</b>	Not determined.																																																																																
<b>Kinematic:</b>	Not determined.																																																																																
· <b>9.2 Other information</b>	<table><tr><td>Name</td><td>Number</td><td>Sp. Grav.</td><td>Vol.(%by wt.)</td><td>VOC(g/L)</td></tr><tr><td>LOR 0.5A</td><td>G516602</td><td>0.946</td><td>98</td><td>930</td></tr><tr><td>LOR 0.7A</td><td>G516603</td><td>0.948</td><td>97</td><td>925</td></tr><tr><td>LOR 1A</td><td>G516604</td><td>0.951</td><td>96</td><td>920</td></tr><tr><td>LOR 2A</td><td>G516605</td><td>0.953</td><td>95</td><td>910</td></tr><tr><td>LOR 3A</td><td>G516606</td><td>0.958</td><td>94</td><td>900</td></tr><tr><td>LOR 4A</td><td>G516607</td><td>0.961</td><td>93</td><td>895</td></tr><tr><td>LOR 5A</td><td>G516608</td><td>0.964</td><td>92</td><td>890</td></tr><tr><td>LOR 6A</td><td>G516658</td><td>0.965</td><td>92</td><td>885</td></tr><tr><td>LOR 7A</td><td>G516609</td><td>0.966</td><td>91</td><td>880</td></tr><tr><td>LOR 8A</td><td>G516610</td><td>0.968</td><td>90</td><td>875</td></tr><tr><td>LOR 10A</td><td>G516611</td><td>0.971</td><td>89</td><td>870</td></tr><tr><td>LOR 15A</td><td>G516612</td><td>0.978</td><td>87</td><td>855</td></tr><tr><td>LOR 20A</td><td>G516614</td><td>0.982</td><td>86</td><td>845</td></tr><tr><td>LOR 30A</td><td>G516616</td><td>0.989</td><td>84</td><td>830</td></tr><tr><td>LOR 50A</td><td>G516619</td><td>0.992</td><td>81</td><td>800</td></tr></table>	Name	Number	Sp. Grav.	Vol.(%by wt.)	VOC(g/L)	LOR 0.5A	G516602	0.946	98	930	LOR 0.7A	G516603	0.948	97	925	LOR 1A	G516604	0.951	96	920	LOR 2A	G516605	0.953	95	910	LOR 3A	G516606	0.958	94	900	LOR 4A	G516607	0.961	93	895	LOR 5A	G516608	0.964	92	890	LOR 6A	G516658	0.965	92	885	LOR 7A	G516609	0.966	91	880	LOR 8A	G516610	0.968	90	875	LOR 10A	G516611	0.971	89	870	LOR 15A	G516612	0.978	87	855	LOR 20A	G516614	0.982	86	845	LOR 30A	G516616	0.989	84	830	LOR 50A	G516619	0.992	81	800
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### 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

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Nitrogen oxides (NOx)

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### SECTION 11: Toxicological information

- **11.1 Information on toxicological effects**
- **Acute toxicity** Based on available data, the classification criteria are not met.

#### · LD/LC50 values relevant for classification:

##### 120-92-3 Cyclopentanone

Oral	LD50	1180 mg/kg (Rat)
Dermal	LD50	>2000 mg/kg (rabbit)
Inhalative	LC50/4 h	>19.5 mg/l (Rat)

##### 107-98-2 1-methoxy-2-propanol

Oral	LD50	5660 mg/kg (Rat)
Dermal	LD50	13000 mg/kg (rabbit)
Inhalative	LC50/4 h	54.6 mg/l (Rat)

##### 102322-80-5 Polyaliphatic imide copolymer

Oral	LD50	>5000 mg/kg (Rat) (Data for compositionally similar material)
Dermal	LD50	>5000 mg/kg (Rat) (Data for compositionally similar material)

- **Primary irritant effect:**
- **Skin corrosion/irritation**  
Causes skin irritation.
- **Serious eye damage/irritation**  
Causes serious eye irritation.
- **Respiratory or skin sensitisation** No information
- **Experience with humans:** No further relevant information available.
- **Additional toxicological information:**
- **CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction)**
- **Germ cell mutagenicity** No information
- **Carcinogenicity** No information
- **Reproductive toxicity** No information
- **STOT-single exposure** No information
- **STOT-repeated exposure** No information
- **Aspiration hazard** No information

### SECTION 12: Ecological information

#### · 12.1 Toxicity

##### · Aquatic toxicity:

##### 120-92-3 Cyclopentanone

EC50/48 h	100 mg/l (daphnia magna)
EC50/72 h	>100 mg/l (scenedesmus subspicatus)
LC50/96 h	>100 mg/l (fish)

##### 107-98-2 1-methoxy-2-propanol

EC50/96 hr	23300 mg/l (daphnia magna)
	>1000 mg/l (green algae)

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LC50/96 h	20800 mg/l ( <i>Pimephales promelas</i> )
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- **12.2 Persistence and degradability** Moderately /partly biodegradable
- **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 1 (German Regulation) (Self-assessment): slightly hazardous for water*  
*Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.*
- **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** N/A
- **Recommendation**  
*Must not be disposed together with household garbage. Do not allow product to reach sewage system.*
- **Uncleaned packaging:**
- **Recommendation:** Disposal must be made according to official regulations.

### SECTION 14: Transport information

- |   |   |
|---|---|
| · <b>14.1 UN-Number</b><br>· <b>ADR, IMDG, IATA</b>   | UN1866  |
| · <b>14.2 UN proper shipping name</b><br>· <b>ADR</b><br>· <b>IMDG, IATA</b>  | 1866 RESIN SOLUTION<br>RESIN SOLUTION         |
| · <b>14.3 Transport hazard class(es)</b><br>· <b>ADR, IMDG, IATA</b><br><div style="text-align: center; margin: 10px 0;">  </div> · <b>Class</b><br>· <b>Label</b> | 3 Flammable liquids.<br>3                     |
| · <b>14.4 Packing group</b><br>· <b>ADR, IMDG, IATA</b>   | III   |
| · <b>14.5 Environmental hazards:</b><br>· <b>Marine pollutant:</b>  | No  |
| · <b>14.6 Special precautions for user</b><br>· <b>Hazard identification number (Kemler code):</b><br>· <b>EMS Number:</b>  | Warning: Flammable liquids.<br>33<br>F-E, S-E |

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- |  |                                |
|--|--------------------------------|
| <b>· 14.7 Transport in bulk according to Annex II of Marpol and the IBC Code</b> | Not applicable.                |
| <b>· Transport/Additional information:</b>                                       |                                |
| <b>· ADR</b>   |                                |
| <b>· Limited quantities (LQ)</b>   | 5L                             |
| <b>· Transport category</b>  | 3                              |
| <b>· Tunnel restriction code</b>   | D/E                            |
| <b>· UN "Model Regulation":</b>  | UN1866, RESIN SOLUTION, 3, III |

### SECTION 15: Regulatory information

- **15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**  
No further relevant information available.
- **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.  
H336 May cause drowsiness or dizziness.
- **Department issuing SDS:** Product safety department
- **Contact:** Tom Cole, EHS Manager (tcole@kayakuAM.com)
- **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 relatif au transport international 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  
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
- **\* Data compared to the previous version altered.**